Professional development and social networks in digital content industry micro businesses

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ABSTRACT

This research study was driven by the lack of empirical studies in Australia about micro businesses operating in the digital content environment. The area of informal learning is not a new topic; it has been researched and discussed over a number of years. What has not been investigated is the link between professionals working in a micro business setting in the digital content industry and how informal learning and accessing their social and business relationships can contribute to their skill and professional development. This thesis suggests that professionals working in this environment would typically need to engage in some form of socially-networked informal learning approach by utilising their social relationships in order to maintain and progress their professional currency as they do not have access to a learning and development or human resources section that can assist in mapping their learning pathway.

This study found the key skill requirements for industry professionals fell into two categories: generic and meta-cognitive or higher-order skills. The generic skills were found to be job-related or legacy type skills but were considered important. The meta-cognitive skills were found to be a key requirement for workers and learners in technologically demanding jobs classified as 21st century skills and related to their ability to learning to learn and being able to identify the necessary skills needed to do their job. The thesis also emphasised the importance of these skills related to the need for workers to be able to search for and synthesise information from a variety of sources, and the need to consciously think about how they learn and develop their learning skills.

This study found three dominant approaches were utilised by industry professionals: online technology/s, communities of practice and formal education and training. Online technology was found to be a key resource as it afforded the learner access to just-in-time information through a distributed network medium. The face-to-face mode of informal
learning was highlighted by the engagement in socially-mediated communities of practice, which ranged from structured regular group meetings to casual and ad-hoc modes of operation. The importance of this form of informal learning was that it was heavily based on the person’s business and social relationships. Finally, formal education and training was found to be important in gaining a qualification that was seen as being important to work in the industry. However, university courses were seen to be lacking in focus and alignment to the requirements of jobs and the industry.

While not claiming to be exhaustive in its nature, this study has been able to not only document the learning networks of industry professionals, it can be seen as a model for employers, business owners, and industry and sector associations to better support and progress the ongoing skill and professional development requirements of jobs and workers in the 21st century.
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KEYWORDS AND DEFINITIONS

Communities of practice: describes a group of people who share an interest, a craft, and/or a profession, where the group can evolve naturally because of the members' common interest in a particular domain or area, or it can be created specifically with the goal of gaining knowledge related to their field (Lave & Wenger, 1991, p. 45).

Digital content industry: describes the creation and modification of digital content, such as animation, audio, graphics, images and video, as part of a production process before presentation in its final form. This large field encompasses many segments such as 3D graphics, audio editing, compositing, and authoring. It also implies a coming together of content and digital technology (CIE, 2005, p.3).

Formal learning: is usually classroom based, highly structured, emphasises individual work and assessment, typically based on a curriculum, and directed by either a teacher, or a trainer (Johnson, 1997, p.168).

Informal learning: is semi-structured and occurs in a variety of places, such as learning at work, and through daily interactions and shared relationships among members of group. In the context of business, professional, and organisational education, the term describes the many forms of learning that takes place independently from communities of practice, instructor-led programs, learning through work, and self-directed learning programs (Billett, 2002, p.56).

Learning network: describes how learning is organised and the network that exists with the various learning activities (Van der Krogt, 1998, p.157).

Micro business: this form of business would typically embrace start-up enterprises, entrepreneurial style of business, self-employed managers with one or two employees, owner managed businesses, team-managed businesses, family-owned businesses, highly technical
businesses, and home businesses where the owner wants to earn a primary or secondary income (Devins et al, 2005, p.541), and typically employs no more than five people (ABS, 2007, p.4).

**Professional development:** is the ongoing development of an individual’s technical, non-technical, and professional skills (Billett, 2004, p.317).

**Social network:** describes the exchange of resources between people and how these interactions build relationships within some sort of social system (Haythornthwaite, 2002).
## GLOSSARY OF TERMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<td>ACE</td>
<td>Adult and Community Education</td>
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<td>ACER</td>
<td>Australian Council for Educational Research</td>
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<td>AIMIA</td>
<td>Australian Interactive Media Industry Association</td>
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<td>AQF</td>
<td>Australian Qualifications Framework</td>
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<td>ASQA</td>
<td>Australian Skills Quality Authority</td>
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<td>BSB</td>
<td>Business Services Training Package</td>
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<tr>
<td>CIE</td>
<td>Centre for International Economics</td>
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<td>CUF</td>
<td>Screen and Media Training Package</td>
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<tr>
<td>DBCDE</td>
<td>Department of Broadband, Communications and the Digital Economy</td>
</tr>
<tr>
<td>DCITA</td>
<td>Department of Communications, Information Technology and the Arts</td>
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<tr>
<td>DCMS</td>
<td>Department of Culture, Media and Sport UK</td>
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<tr>
<td>GST</td>
<td>Goods and Services Tax</td>
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<td>IBSA</td>
<td>Innovation and Business Skills Australia</td>
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<td>ICA</td>
<td>Information and Technology Training Package</td>
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<td>ICP</td>
<td>Printing and Graphics Training Package</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>NCVER</td>
<td>National Centre for Vocational Education Research</td>
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<tr>
<td>RTO</td>
<td>Registered Training Organisation</td>
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<tr>
<td>SME</td>
<td>Small to Medium Enterprise</td>
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<td>TAFE</td>
<td>Technical and Further Education</td>
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STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted to meet the requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: QUT Verified Signature

Date: 12 May 2014
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Chapter 1

Introduction

Research problem

This study examined the learning processes of professionals working in micro businesses operating in the digital content industry. The Australian Interactive Media Industry Association (AIMIA, 2005) notes that the digital content industry is an important direct and indirect contributor to the Australian economy and society, and faces growing challenges in coping with competing demands and the rapidly changing technological and innovative environment. While the Department of Broadband, Communications and the Digital Economy (DBCDE, 2013) argues that information and communications technologies (ICTs) are key to ongoing productivity and competitiveness. This study was driven by the lack of research in Australia relating to how individuals working in the industry manage their skill and professional development.

Businesses within the digital content industry face growing challenges in coping with competing demands and with the rapidly changing technological environment (AIMIA, 2005; DBCDE, 2013). With these demands and changes comes the need for those within the digital content industry to be adequately skilled to meet the challenges, both now and in the future. As a result, individual jobs have become more complex (Centre for International Economics, CIE, 2005, Higgs, Cunningham & Pagan, 2007). Workers in the digital content industry typically have two choices for learning: formal education and learning by gaining a qualification, or informal learning that occurs in a semi-structured manner and in a variety of settings. It is suggested that informal learning is an approach that professionals working in micro businesses in the digital content industry must exploit because they do not necessarily have access to a managed formal learning pathway through either a human resources or learning and development section.
Informal learning has emerged within the field of vocational and workplace education and has been discussed by a number of prominent writers (for example Billett, 2001, 2002, 2007; Dale & Bell, 1999; Eraut, 2000, 2004; Eraut & Hirsch, 2007; Marsick & Watkins, 1990). These writers consider the relationship between the learner and the environment, and acknowledge that the most important learning takes place through interaction with others. Informal learning, then, is represented by a range of strategies that include conversation, social and business interactions and team work. Marsick & Watkins (1990) suggest that informal learning includes self-directed learning and networking. Additionally the literature discusses the role of the individual and their social and business relationships in their informal learning. Gaining this understanding can have a positive influence for businesses within the digital content industry by providing businesses with better knowledge of ways to support individuals, and through developing and providing the wider digital content industry with better skilled workers.

Eraut (2000), one of the seminal writers in the field of informal learning, describes informal learning as often being associated with the workplace. Eraut (2004) also acknowledges the role of informal learning for the individual within the broader education sector. He suggests the term ‘informal learning’ has been used increasingly in adult education for several reasons and that informal learning provides a simple contrast to formal education and training and allows for greater flexibility and freedom for learners. He also recognises the social significance of learning from other people.

In describing the function between formal and informal learning, Marsick & Watkins (1990) write:

Formal learning is typically institutionally sponsored, classroom based, and highly structured. Informal learning, a category that includes incidental learning, may occur in institutions, but is not typically classroom based or highly structured, and control of
learning rests primarily in the hands of the learner ... informal learning can be deliberately encouraged by an organisations or it can take place despite an environment not highly conducive to learning. (p.12)

Taking up the point regarding the impact of informal learning, Marsick & Watkins (1990) argue that informal learning can take place wherever and whenever people have the need, motivation or opportunity to learn.

The role of networking and interactions in learning is highlighted by writers such as Falk (1997), Granovetter (1985), Haythornthwaite (2002), Lave & Wenger (1991), Putnam (2007) and Van der Krogt (1998). They assert that social networks are people, groups and businesses joined by a variety of relationships that involves the exchange of resources and information between people; interactions that provide an approach to better understand flows between people, groups and businesses; and various learning activities between its members. Reinal & Kelliher (2008) also argue that the network environment can provide support for learners, support and enhance the development of competencies and skills and be a knowledge resource for the learner.

At this point it is worth noting that a number of traits link the idea of social networks, communities of practice and learning networks: the role of the individual in a network or a community, social and business relationships of the individual, knowledge and information sharing between individuals, and situated learning that is work and profession or industry focused.

**Context of the study**

Although many writers have written about the need for skill and professional development in the creative industries and the of the role of informal learning through social and business relationships, there is a genuine lack of empirical studies relating to informal learning in the digital content industry. In fact the majority of the literature and articles
accessed for this study relating to skill and professional development in the creative industries and small business sectors have been written in the UK and Europe (Barber, 2003; Devins, Gold, Johnson, & Holden, 2005; Matlay, 1999; Perren & Grant, 2001; Raffo, Lovatt, Banks, & O’Connor, 2000; Reinl & Kelliher, 2008). While these are based on experience and some empirical study within businesses and organisations, more relevant research situated in Australia’s digital content industry would assist in providing a greater context for learning in digital content micro businesses specifically, and encourage workers to access learning opportunities more effectively (Devins et al, 2005).

Several writers point to a lack of research within not only the creative industries generally but more specifically within the digital content industry sector. For example Skerlavaj, Dimovski, & Mrvar (2008) propose “we believe (our research) offers a useful framework for studies of learning networks” (p.56) and added that valuable insights with regard to the learning network perspective would emerge after conducting further research in businesses of various sizes, and in different industries.

Focusing on the need of further education and skills development in the creative industries and micro business sectors, Raffo, Lovatt, Banks, & O’Connor (2000) write:

Many formal business training and support courses ... are largely unhelpful – business knowledge that is actively used in business is actively derived and developed from interactions of individuals within a purposeful domain of practice and hence is, in part, a product of the activity, context, and culture in which it is developed and used. What we have seen is the practical business knowledge is not easily developed in formalised external training contexts away from the reality of trainee’s business experience and activity. (p.363)

Delahaye (2004) in looking at small business learning points out that not all knowledge is necessarily available within the business and that, sometimes, the individuals
working in a business have to look outside, to formal learning institutions. He suggests that learning can be conducted at either the workplace or in a social off-site setting, in small groups, and this can viewed as a natural learning path for the individual. This has great relevance to this study in that the study’s aim is to understand how professionals who working in micro businesses and who do not have the luxury of a learning and development section would typically manage and plan their learning pathway for what would typically be needed to engage with their business and social networks and to identify their skill and professional development requirements to maintain their currency within the industry.

McWilliam & Haukka (2008) and Tak (2008) argue that the individual should be in control of their own learning, and their learning would be greatly enhanced if the learner operated within their personal networks with confidence. Van der Krogt (1998), in writing about how learning networks provide the opportunity for development, emphasises that all people are different, that they have their own individual learning experience, divergent views on what they want to learn and differ in their capacity to learn, but they must take responsibility of their own development. In their seminal work on socially-based learning, Lave & Wenger (1991) see the workplace as the site of a social practice supported by a community of workers, and identify the notion of a community of practice. They use the term communities of practice to describe learning through practice and participation, which they also call “situated learning” (p.3). They note that communities of practice are more than just groups of individuals learning from, and with, each other; they are groups of individuals where learning occurs between the group members. The significance, then, of the learning theory surrounding communities of practice lies in its implications for skill and professional development of the individual. Learning networks focus on learning activity through social and business relationships as a mechanism for this ongoing skill and professional development.
The reason for considering the role of informal learning networks in the broader context of skill and professional development for workers in the digital content industry is summed up by Tak (2008), who asserts that professional development and learning can play a crucial role in the development of skills of the IT worker through access to, and involvement in, a learning network. In his study of IT professionals, Tak (2008) found that in an attempt to keep abreast of new technologies and work practices, the IT professionals resorted to being proactive in their professional development through their personal knowledge-base and support networks. In a study of how professionals utilise informal learning for their professional development, Cheetham & Chivers (2001) found that a majority of the respondents identified networking with fellow professionals as being a significant source of information that contributed to their professional development. Cheetham & Chivers (2001) conclude that professionals should network and collaborate with others in their learning.

In the learning network literature, Van der Krogt (1998) suggests that in the learning network, new insights and methods are developed in the professional field and transferred to the professionals working within a business context or between the learners in a professional field. The network, he suggests, extends beyond the workplace boundaries and includes outside social and business relationships, special events, refresher courses, or even formal education courses, while, Raffo et al (2000) suggest that learners can learn through a reciprocal exchange of ideas in an informal setting. These claims highlight the importance of grounding this study in both the informal learning and learning networks literature.

Based on the review of the literature, it is clear that informal learning, and indeed learning networks, have been identified as being important. There is little empirical evidence to identify how individuals working in the digital content industry and, by extension, micro businesses in the industry, approach their ongoing skill and professional development. It is also clear that investigating this area within the broader creative industries sector is critical,
as little Australian-based empirical evidence exists, and the field is, more importantly, crucial for the digital content industry, which plays a key part in the broader technological landscape in Australia’s economy. Raffo et al (2000) are quite clear in how individuals in the creative industries should learn and develop their skills “to network and to work with others, to copy, adopt, assimilate, and develop ideas from within their community of practice” (p.362). They are also critical of how formalised business training is de-contextualised and lacks understanding of the learner’s socio-cultural relationships.

Research questions

The broad intent of this study is to describe how informal learning networks contribute to the skill and professional development of individuals working in micro businesses within the digital content industry. Typically, these types of businesses include commercial art, film and video, photography, electronic games, recorded media, sound recording and information storage and retrieval services.

The research questions for this study are:

1. What are the key skill and professional development learning needs of digital content workers in micro businesses?
2. What approaches do they undertake for their skill and professional development learning?
3. What is the role of the informal learning network in digital content worker’s skill and professional development learning?
4. How do these informal learning networks operate?

Significance of the study

While there have been a number of papers, articles, and studies focussing on informal learning (for example Bell, 1977; Billett, 2001, 2002, 2007; Eraut, 2004; Eraut & Hirsch, 2007; Marsick & Watkins, 1990) and the need for individuals in creative industries to continually develop their skills and undertake continual professional development (see
Bridgstock, 2009; Devins, et al, 2005; Matlay, 1999; Perren & Grant, 2001; Raffo et al, 2000) a study about how individuals working in micro businesses in the digital content industry utilise informal learning networks in their skill and professional development has not been undertaken.

The intent of this study is to provide a better understanding of, and to build a picture of, how individuals working in micro businesses engage and interact with their informal learning networks, the skills and professional development requirements for their role in the industry, and the approaches these individuals undertake to satisfy their skill and professional development. In fact, the intent and subsequent content of this thesis is summed up by one of the interviewees, who suggested that by interacting informally with other industry professionals it affords the learner professional currency:

\textit{This is quite typical of the industry ... it’s appealing as it’s not a course, it’s current and new, it’s related to the nature of our work and training or a course may not always be the answer; currency of information in some courses may be dated due to the rapid pace of change.} (I02)

**Thesis structure**

This thesis begins by providing a background to the study into the role that informal learning plays in the skill and professional development of micro business digital content industry workers. The justification for the study was based on the lack of empirical studies in this area and was supported by extensive literature in the areas of social networks and informal learning. Chapter two of this thesis provides information on the key areas of the creative economy, creative industries and the digital content industry. The second section of the chapter discusses how work is organised in the digital content industry in terms of micro businesses and project-based work. The literature review continues by reviewing and discussing several skill frameworks and taxonomies, and that skill and professional
development in the industry can be addressed through either formal education and training or informal learning. The chapter concludes by highlighting the role of social networks and, indeed, informal social learning approaches of learning networks, online networks and communities of practice, in aiding a person’s development. Chapter three highlights the research methodology adopted for this study, which used a mixed method approach in two distinct data collection phases through an online survey and semi-structured interviews. The chapter provides the rationale for the chosen approaches, the methods of participant selection and data collection and analysis techniques. The data collected from this study is presented in Chapters four, five, and six. In Chapter seven a discussion of the research findings is provided. The thesis concludes with Chapter eight, which outlines the conclusions, limitations of the study suggested directions for future research and the study’s contributions to knowledge.

**Summary**

This chapter provided an overview of this study, the purpose and the significance of conducting this study, the research questions and a broad introduction of the literature surrounding the research problem. The following chapter provides a background to the creative economy, creative industries and the digital content industry. The chapter continues by identifying several relevant skill frameworks and taxonomies, and concludes by discussing informal learning, formal education and training, and socially-based networked learning approaches.
Chapter 2

Literature review

Introduction

This chapter provides a review of literature predominantly focused on the areas of formal and informal learning as it pertains to addressing the research problem, which is to identify and describe how informal learning networks contribute to the skill and professional development of individuals within the digital content industry.

The chapter commences by outlining and describing the importance of the creative economy to Australia, the contribution the creative industries make to the creative economy as a key contributor to the broader economy and the structure and relevance of the digital content industry within the broader creative industries sector. The chapter continues by outlining the size of the digital content industry, and that the majority of the industry is comprised predominantly of small to medium businesses, and identifies several skill taxonomies and frameworks related to digital content professionals, and also highlights the fact that skill and professional development is typically managed by the individual. The final sections of this chapter outline formal and informal learning as the main approaches to professional development. The review of formal learning is divided into four areas: higher education, vocational education and training, short courses and organisational facilitated learning. The section on informal learning focuses on the social approaches to learning through social networks, communities of practice and learning networks, as well as providing some empirical evidence through studies that have been conducted in this area. The chapter concludes by outlining the four research questions, which were developed to address the research problem.
This review of literature commences by contextualising the digital content industry in the wider creative economy. In so doing, it discusses the economic contribution of the digital content industry.

The creative economy

The creative economy is not a sector, but is a set of economic processes that act on the economy as a whole to invigorate innovation based growth (Potts & Cunningham, 2008; Potts, Cunningham, Hartley, & Ormerod, 2008). The core of the creative economy is innovation, which requires new knowledge combined with the ability to turn that knowledge into new ideas (Hearn & Bridgstock, 2010).

The creative economy is of crucial significance to Australia’s economic wellbeing by virtue of the fact that it adds to the country’s gross national product and the capacity to compete based on doing different things, and the ability to be innovative is key to the creative economy (Howkins, 2001). So, the creative economy is about the relationship between creativity and economics. Howkins (2001) also notes that while creativity and economics are not new the extent of the relationship between them and how they are combined is what ultimately create value and wealth for the country. Suciu (2008) writes “the creative economy is the idea business; it turns ideas into products” (p.2).

Florida (2002) takes up the point of the economic value of the creative economy and contends that the key to economic growth lies not just in the ability to attract the creative group but to translate that underlying advantage into the creative economic outcomes in the form of new ideas, new businesses and growth in the market. Ultimately, however the creative economy should be driven by a truly creative community that can survive and prosper in the emerging creative age; the key to this is creative and successful people (Suciu, 2008).
A significant contributor to the creative economy is the creative industries, through innovation, economic endeavour and knowledge. A key component and contributor to the creative economy is the creative industries, of which the digital content industry is a major player.

Creative industries

The Department of Culture, Media and Sport UK (DCMS, 1998), the department within the UK government responsible for culture and the creative industries developed the accepted definition of the creative industries. DCMS (1998) presents the creative industries in two broad terms: creativity and intellectual property, which they identified as an extension of the cultural industries. According to Potts et al (2008) the definition of the creative industries has not changed much since it was first described by the DCMS (1998). Another prominent writer Howkins (2001) describes the creative industries as comprising advertising, architecture, art, crafts, design, fashion, film, music, performing arts, publishing, research and development, software, toys and games, TV and radio, and video games. Howkins (2001) suggests that creative industries are a range of economic activities concerned with the generation or exploitation of knowledge and information.

Knowledge and creativity are key attributes of the creative industries which have risen and grown into the innovation space as the economy has become more complex, and fit into the broader economic framework of the country. Potts et al (2008) argue that creativity is an important resource and is a driver for innovation and ideas, while Cunningham (2002) argues that the creative industries concept is a component of the knowledge economy model, which provides economic value, and confirms that the creative industries are part of the technological landscape where creativity is produced and consumed. At this point it is worth noting that the knowledge economy is described as an economy in which the production factors of labour and capital are aimed in the development and application of new
technologies, and that the ultimate goal of the knowledge economy is the application of these new technologies (Cunningham, 2002).

Caves (2000) notes that creativity, originality, technical and professional skills are key outputs of the creative industries. According to Florida (2002) and Hesmondhalgh (2002) the creative industries begin to converge with the idea of the creative economy, as is described by Hearn & Bridgstock (2010). In support of this view, Potts et al (2008) suggests that creative industries provide a pathway for innovation by introducing novel ideas that then filter through to other sectors within the wider creative industries sector. Potts et al (2008) also add that creative industries may facilitate the adoption and retention of new ideas and technologies.

The role the creative industries play in the innovation process is argued by Hartley (2007) who writes: “the creative industries are important because they drive demographic, economic and political change” (p.4), while Potts et al (2008) note that the creative industries have a significant market value and are the “vanguard of economic growth” (p.168). The digital content industry plays a crucial role at the innovation and technological forefront of the creative industries sector, and this will be discussed in the following section.

**Digital content industry**

In a study by the Centre for International Economics (CIE) in 2005, commissioned by the Department of Communications, Information Technology and the Arts (DCITA), the CIE (2005) describes the digital content industry as:

Digital content implies a coming together of content and digital technology. The production of content has traditionally been the preserve of the creative industries (such as film and advertising). Digital content production and distribution opens the door for the participation of individuals and firms with expertise and capabilities in information and communications technologies (p.3)
Higgs & Kennedy (2004) present a list of sectors and some examples of companies in each sector. The list of sectors in the digital content industry is shown below in Table 1.

**Table 1: Sectors within the digital content industry (Higgs & Kennedy, 2004)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Examples of companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen/film pre-production, production and post-production</td>
<td>Working Dog, RB Films, Movie Lab, Complete Post, Cutting Edge</td>
</tr>
<tr>
<td>Free to air (FTA) and subscription TV pre-production, production and postproduction</td>
<td>Southern Star, Grundy, Beyond, Hilton Cordell</td>
</tr>
<tr>
<td>Broadband content development</td>
<td>ABC, Chief Entertainment, Brainwaave, iTV World</td>
</tr>
<tr>
<td>Interactive and digital TV applications and content development</td>
<td>iTV World, Massive, Brainwaave</td>
</tr>
<tr>
<td>Online and interactive games</td>
<td>Auran, Krome, Torus, Blue Tongue, InfoGames</td>
</tr>
<tr>
<td>Internet based digital content publishing and distribution</td>
<td>Hydro, Massive, HotHouse, Brainwaave, Swish</td>
</tr>
<tr>
<td>Online education content development</td>
<td>Qantm, Ryebuck Media, Crank Media, Cadre Design, Roar Films, Nine Lanterns, Learning Curve, CWA New Media, Impart Corporation</td>
</tr>
<tr>
<td>Mobile 3G content development and publishing</td>
<td>Mobilesoft, Legion Interactive, BigWorld, Imagination Entertainment, 5th Finger</td>
</tr>
<tr>
<td>Content creation and manipulation software</td>
<td>MediaWare, AnimalLogic, Proximity</td>
</tr>
<tr>
<td>Learning, rights, and content management and other digital creative industry related software applications</td>
<td>Harvest Road, Southrock, Catalyst Interactive, KE Software, TerraText (SIM), Wizard Information Systems, IPR Systems, Morpheum, Rumble Group, Aptrix</td>
</tr>
</tbody>
</table>

AIMIA (2005) describes the digital content market structure in two parts: service providers and content providers. Service providers include companies that tend to work on a fee-for-service basis and generally do not earn ongoing revenue from their intellectual property. In most cases, these companies are less reliant on government funding, and end customers tend to be more fragmented. Content providers on the other hand comprise
companies that primarily create and own their own intellectual property. AIMIA (2005) argues that “the digital content industry is an important direct and indirect contributor to the Australian economy and society” (p.3). In their study the CIE (2005) highlighted this point and reported that the digital content industry is transforming traditional industry structures, business models and ways of doing things and are likely to form an important set of activities in their own right. CIE (2005) noted the impact of the digital content industry on the Australian economy by suggesting that “a recognition from the Australian Government that digital content and applications will become increasingly important, both in economic terms and as a means of expressing Australia’s unique cultural identity” (p.1). Expanding on the composition and the activities undertaken by businesses in the digital content industry, AIMIA (2005) notes “they are active in a range of areas” (p.18). The activities undertaken by businesses in the digital content industry are outlined below in Figure 1.

![Figure 1: Activities undertaken by digital content businesses (AIMIA, 2005)](image-url)
AIMIA (2005) reports that a majority of businesses in the digital content industry classified both their main activity and their main end product as advertising. They also report that businesses in the digital content industry tend to align themselves with, and define themselves by their end customers. AIMIA (2005) notes that an affiliation exists between advertising and the digital content industry:

Advertising is the largest single market for content in Australia, and a key source of revenue for companies in the production, post-production, animation and special effects sectors. Companies in interactive multimedia identified particularly strongly with the advertising industry, as the re-design and re-development of websites was often part of a larger branding campaign. (p.19)

AIMIA (2005) notes that a number of businesses are involved in more than one activity within the industry, with the average business involved in 1.7 activities. It can also be noted that although film does not appear in its own right as an activity, as it does in Higgs & Kennedy’s (2004) list of sectors in the digital content industry, a number of activities are strongly associated with the film industry sectors. These activities include special effects, animation, technical services, video and audio production and post-production. CIE (2005) also highlights the challenges faced by small business in the digital content industry and it notes that, typically, businesses in the industry are either in content creation or distribution, but seldom both, and their success often hinges on their ability to link up with larger organisations that function as content aggregators. Adding to the importance of digital content industry and the evolution of the type of work conducted and businesses within the industry, Higgs, Cunningham & Pagan (2007) suggest that these professionals, who are in the “production, creation and publishing of experiential and informational media” (p.22), are typically working in sectors such as multimedia, software development, games development, and digital film and television work at the leading edge of ICT transformation.
According to AIMIA (2005) and the Department of Broadband, Communications and the Digital Economy (DBCDE, 2013) the digital content industry is an important direct and indirect contributor to the Australian economy and society. In further discussing the importance of the digital content industry on Australia’s economy the DBCDE (2013) notes that the direct contribution of digital based businesses and the internet added $50 billion to Australia’s economy in 2011. To highlight the importance of digital technologies, a report by the DBCDE (2013) suggests that a global network of economic and social activities is enabled by information and communications technologies (ICTs), and is widely acknowledged as being one of the keys to future productivity, competitiveness and social wellbeing.

With respect to business turnover, AIMIA (2005) reports the average turnover for a business in the digital content industry is just under $3 million per annum, and 61% of all businesses turn over less than $5 million. CIE (2005) also reports on the impact of digital content businesses on Australia’s domestic market. According to CIE (2005) the value of total digital content imports as a proportion of value added in the aggregate economy was approximately 6.4 percent in 2002-03. However, the value of total digital content exports as a proportion of value added was approximately 1.3 percent. This means that the majority of sales for the Australian digital content industry occur in the domestic market. Consequently, CIE (2005) argues that Australia’s digital content businesses seem to be more competitive in their own market rather than in foreign markets.

Creativity is very much at the core of activity with the digital content industry. CIE (2005) highlights the value of creativity in the digital content industry and notes “creativity is at the core of most digital content activity ... success in the digital content industry requires the marriage of what can be termed artistic, technical, and business creativity” (p.11). As Howkins (2001) notes, creativity is present at all levels of business from the establishment
and management of a company to the development, branding and shaping of each product.
Based on this the role of the digital content industry cannot be ignored.

**Working in the digital content industry**

The rapid development of digital technologies and the digitisation of content creation have opened up opportunities for many professionals either working alone or co-creating with other professionals; therefore, it is important to acknowledge how work is conducted in the digital content industry.

According to CIE (2005) the digital content industry was estimated to provide approximately 300,000 jobs to the Australian economy. The digital content industry consists of a small number of large businesses, but is predominantly comprised of small businesses, including approximately 24,000 micro businesses (AIMIA, 2005). Notably, AIMIA (2005) also reported that approximately 20,000 businesses had nine full-time staff or less, and at the other extreme, approximately 300 businesses employed in excess of 100 full-time staff. AIMIA (2005) also reported that staff size varied by sectors within the industry and that those businesses in the communications and marketing sector and that produce software were likely to employ more staff. According to AIMIA (2005) the average number of full-time staff employed by companies in the digital content industry at that time was approximately 22. They also reported that the number of full-time employees tend to be greater in more established businesses. In addition, for every two full-time staff members employed in the industry there is one part-time staff member. CIE (2005) noted how these small businesses operated in that “many of the smaller firms, teams of workers are often assembled on a project-by-project basis, such as in the production of motion pictures” (p.16). Other literature further identifies the predominant modes of business operation relevant to the digital content industry: the micro business and the project-based operation (Devins, Gold, Johnson, &
Holden, 2005; Tak, 2008). In fact Higgs et al (2007) contend that the creative industries are predominantly made up of micro businesses and sole traders.

The term micro business has gained currency over the past ten years (Devins et al, 2005). They are generally defined as a business employing less than 5 people as described by the Australian Bureau of Statistics (ABS, 2007). They make an important contribution to the Australian economy, and employ approximately 527,500 people (ABS, 2007). This form of business, according to Devins et al (2005), would typically include start-up enterprises, entrepreneurial style of business, self-employed managers with one or two employees, owner managed businesses, team-managed businesses, family-owned businesses, highly technical businesses, and home businesses where the owner wants to earn a primary or secondary income. Typically then, the digital content industry fits within this model of a micro business as they tend to operate as highly technical businesses, entrepreneurial businesses, self-employed owner/managers and in some cases, one or two person operations.

Devins et al (2005) add that the micro business can have complex social organisations and managers and owners play a key role in the culture within the business operation. Devins et al (2005) note that typically within a small-to-medium business, the role of the manager or supervisor is one that encompasses financial, business, marketing and human resource management. The management of the human resource function is supported by a human resource team or section in these larger businesses. Conversely, the manager or owner of a micro business does not have the luxury of the “personal development and staff appraisal impetus offered by larger businesses” (Devins et al, 2005, p.542), but rather their role in a micro business is more fundamental with respect to building “capacity, capability, and improvement of the economy” (Devins et al, 2005, p.542). They highlight the limitations of the manager/owner in terms of the human resource management function. They suggest that because they are heavily involved in the day-to-day running of the business, the manager or
owner have a financially significant stake in the business, and as such they have a very limited internal labour market, with no supervisory or staff progression structures.

Devins et al (2005) argue that “learning development is valued through everyday relationships with others who by necessity make the business work and thus forms the basic construct of the micro business” (p.543). Working in a highly technical, innovative, complex, and in some cases a production type of environment, lends itself to operating and collaborating in project teams. In project work, especially development and production type work, digital content workers would often work in a project type operation.

Another mode of business operation that describes how work is conducted in the digital content industry is discussed by CIE (2005), and Tak (2008). Tak (2008) identifies a number of factors that constitute what he terms the project-based operation and indeed project-based learning. He suggests that this type of activity involves complexity, collaboration with other people, in some cases a steep learning curve, and working with experts who are brought into the business. Tak (2008) also argues that highly intensive and highly focused work occurs as part of a project team, and typically the project outcome is based on the creation or innovation of a unique service or product. He goes on to add that learning through project-based work is the preferred method of learning in the workplace, especially for professionals working in industries related to information and communication technology (ICT). For the individuals working in a micro business in the digital content industry this is particularly relevant as they would typically rely on informal learning through work because they may not necessarily have access to the formal learning pathway.

In this study, the focus is individuals working in micro businesses within the digital content industry, as it seems logical that they must engage in self-managed and self-directed professional development to progress their skill and professional development as they do not have the support of a human resources or learning and development section to plan and
manage their learning activities (Eraut & Hirsch, 2007). An understanding of how these individuals learn informally may help to enhance the support for skill and professional development in the sector.

**Skills frameworks and taxonomies**

For the purposes of this present study the definitions used to aid in classifying, and ultimately to coding, and describing, responses to the skills questions from the two phases of the study, several frameworks, taxonomies and skill lists were used.

**Occupational and job-related frameworks**

An understanding and identification of occupationally-specific skills and several empirical and theoretical works were developed as a way to address the issue of the skills gap or skills needed by workers in the business environment. Based on an initial review of literature in the area of skills taxonomies and frameworks, two well-known taxonomies and skill lists were identified: the National Centre for Vocational Educational Research (NCVER, 2003) generic skills listing, and Mumford, Peterson & Childs (1999) Occupational Information Network (ONET) skills list.

In 1992 the Mayer Commission marked the beginning of the establishment of what was known as key competencies in Australian education. They identified eight key competencies that were “essential for effective participation in the emerging patterns of work and work organisation ...they focus on the capacity to apply knowledge and skills in an integrated way in work situations” (p.7). The list of competencies and skills developed by the Commission include communication skills, team work, problem-solving, initiative and enterprise, planning and organising, self-management, learning, and technical and technology skills. These competencies continue to form part of what has since evolved as the Employability Skills Framework, which was developed jointly by the Australian Chamber of
Commerce and Industry (ACCI) and the Business Council of Australia (BCA) in 2006 and then incorporated into Australia’s training packages.

Mumford et al (1999) in their ONET definition of skills describe them as “procedures for acquiring and working with information” (p.50) and noted three important implications for working professionals: skills are not necessarily characteristics of the individual, and therefore may be more adaptable, skills can be defined at varying levels of generality or generic type skills (also described by Forfas, 2007) and skills can be defined in terms of the performance domain of occupational-related skills. In their taxonomy of skills, Mumford et al (1999) group skills in three broad categories: basic such as reading and writing; generic skills which would typically include elements such as problem-solving, idea generation, and coordination; and cross-functional skills such as installation and programming, technical skills, and business and resource management skills. However, in the course of a more detailed review of literature a number of other frameworks and skills lists emerged which are termed “competencies needed for the 21st century” (Voogt & Roblin, p.299, 2012).

21st century skills frameworks

Dede (2010) argues that the 21st century is different from the 20th century in the capabilities people need for work, and what other writers (see Cobo, 2013; Plomp, 2013; Voogt & Roblin, 2012) identify as frameworks for skills needed in the 21st century, which they argue are needed by workers and learners in the information society of the 21st century. Dede (2010) also suggests that 21st century skills are different to 20th century skills, as was highlighted in the work of writers such as Eraut (2004), NCVER (2003) and Mumford et al (1999), due primarily to the emergence and rapid advancement of information and communications technologies (ICT). Plomp (2013) and Voogt & Roblin (2012) that argue the skills and competencies required for workers and indeed learners in the 21st century have changed due to the changing nature of the types of jobs demanded by a knowledge society in
the 21st century. This view is supported by earlier work done by economists Levy & Murnane (2004) who highlight a crucial component of what constitutes 21st century knowledge and skills:

Declining portions of the labour force are engaged in jobs that consist primarily of routine cognitive work and routine manual labour – the types of tasks that are easiest to program computers to do. Growing proportions of the nation’s labour force are engaged in jobs that emphasize expert thinking or complex communication – tasks that computers cannot do. (p. 53–54)

Anderson (2008) adds further weight to the difference between the concepts of information-based 21st century society and states that “while the information society metaphor is associated with an ‘explosion’ of information and information systems, the knowledge society metaphor primarily refers to economic systems where ideas or knowledge function as commodities” (p.5). Anderson (2008) suggests that many authors use the terms information society and knowledge society interchangeably as most people he argues do not differentiate between them and tend to equate information and knowledge equally. In fact in linking the creative and innovation functions with skills needed by these professionals, Cunningham (2013) and Goldsmith (2013) argue that the growth and importance of specialist digital industry occupations is an indicator that these particular attributes and skills which have not been needed before but are now increasingly important to social, cultural and economic life in the 21st century.

To this end Dede (2010), Plomp (2013), and Voogt & Roblin (2012) describe several international skill and competency frameworks suited to the requirement of 21st century skills of which five have a direct bearing on the outcomes of this present study and more importantly to digital content professionals: Binkley, Erstad, Herman, Raizen, Ripley & Rumble (2010) KSAVE model for 21st century skills, EnGauge Metiri Group/NCREL
framework (2003), International Society for Technology in Education ICT (ITSE, 2007), Jenkins, Clinton, Puroshotma, Robinson & Weigel’s Literacies based on New Media (2006), and Partnership for 21st Century Skills (P21, 2006). However, it is also worth noting that notwithstanding these 21st century skills frameworks, the skills identified by Cheetham & Chivers (2001), Eraut (2004), Forfas (2007), NCVER (2003), and Mumford et al (1999) also have some significance and alignment with the skills described in the 21st century skill frameworks. These major 21st century skills frameworks will now be described.

**KSAVE model**

The KSAVE model for 21st century skills was an outcome of an international, collaborative project aimed at assessing and teaching 21st century Skills’ (ATC21S). Binkley et al (2010) present a framework for 21st century skills, and also, for each skill the knowledge, skills, attitudes, values and ethics (KSAVE) needed for competence.

In their model Binkley et al (2010) provide operational definitions for each skill and group them in three categories: knowledge (K), which refers to specific knowledge or understanding requirements for each of the skills; skills (S), which focuses on the abilities, skills and processes that curriculum frameworks are designed to develop in students; and attitudes, value, and ethics (AVE), which refers to the behaviours and aptitudes that workers and learners should exhibit in relation to the ten skills identified in the framework. The aim of the framework is to provide educators with standards for what learners need to demonstrate in order to master a particular skill. Table 2 below provides a summary of the KSAVE model for 21st century skills.
Table 2: KSAVE model for 21st century skills (Binkley et al, 2010)

<table>
<thead>
<tr>
<th>Ways of thinking</th>
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</thead>
<tbody>
<tr>
<td>1. Creativity and innovation</td>
</tr>
<tr>
<td>2. Critical thinking, problem-solving, and decision making</td>
</tr>
<tr>
<td>3. Learning to learn and meta-cognition</td>
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</table>

<table>
<thead>
<tr>
<th>Ways of working</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Communication</td>
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<tr>
<td>5. Collaboration and teamwork</td>
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<tr>
<th>Tools for learning</th>
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<tbody>
<tr>
<td>6. Information literacy which includes research or sources, evidence, and biases</td>
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<tr>
<td>7. ICT literacy</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Living in the world</th>
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</thead>
<tbody>
<tr>
<td>8. Citizenship – local and global</td>
</tr>
<tr>
<td>9. Life and career</td>
</tr>
<tr>
<td>10. Personal and social responsibility including cultural awareness</td>
</tr>
</tbody>
</table>

EnGauge Metiri Group/NCREL framework

EnGauge was developed in 2003 by the Metiri group and the Learning Point Associates with the purpose of fostering 21st century competencies in learners and workers. Their framework is based on four broad skill categories namely: digital-age literacy, inventive thinking, effective communication and high productivity. Table 3 below provides an outline of the EnGauge framework model for 21st century skills.

Table 3: EnGauge framework (Metiri/NCREL, 2003)

<table>
<thead>
<tr>
<th>Digital-Age Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Basic, scientific, economic, and technological literacies</td>
</tr>
<tr>
<td>• Visual and information literacies</td>
</tr>
<tr>
<td>• Multicultural literacy and global awareness</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Inventive Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adaptability, managing complexity, and self-direction</td>
</tr>
<tr>
<td>• Curiosity, creativity, and risk taking</td>
</tr>
<tr>
<td>• Higher-order thinking and sound reasoning</td>
</tr>
</tbody>
</table>

25
**Effective Communication**
- Teaming, collaboration, and interpersonal skills
- Personal, social, and civic responsibility
- Interactive communication

**High Productivity**
- Prioritising, planning, and managing for results
- Effective use of real-world tools
- Ability to produce relevant, high-quality products

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*International Society for Technology in Education (ISTE) framework*

To emphasise the ways in which ICT skills are central to the 21st century, in 2007 the ISTE revised its standards for technology in education with the purpose of setting goals for what workers and learners should know and be able to do with technology in education. The ITSE (2007) framework identifies six skill categories: (1) creativity and innovation; (2) communication and collaboration; (3) research information fluency; (4) critical thinking, problem-solving, and decision-making; (5) digital citizenship; and (6) technology operations and concepts. In reviewing the ISTE (2007) framework, Dede (2010) suggests the key difference that distinguishes 21st century skills from 20th century competencies is that a person is a tool through which application, medium, and environment work together. Dede (2010) adds that ICT are not mere mechanisms for attaining a desired behaviour, but rather through distributed knowledge and collaboration, understandings are shared, and this flows to work performance. The ISTE (2007) digital literacies framework emphasises the need for ICT skills highlighted by such skills as creating original works, using models and simulations to explore complex systems and issues, identifying trends and forecasting possibilities, and focuses heavily on the role of ICT in the 21st century with skills such as digital citizenship. Table 4 below shows the ITSE (2007) framework for ICT framework education and learning.
Table 4: ITSE digital literacy framework (ITSE, 2007)

<table>
<thead>
<tr>
<th>1. Creativity and Innovation</th>
<th>Demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• applying existing knowledge to generate new ideas, products, or processes;</td>
</tr>
<tr>
<td></td>
<td>• creating original works as a means of personal or group expression;</td>
</tr>
<tr>
<td></td>
<td>• using models and simulations to explore complex systems and issues; and</td>
</tr>
<tr>
<td></td>
<td>• identifying trends and forecasting possibilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Communication and Collaboration</th>
<th>The use of digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• interacting, collaborating, and publishing with peers, experts, or others employing a variety of digital environments and media;</td>
</tr>
<tr>
<td></td>
<td>• communicating information and ideas effectively to multiple audiences using a variety of media and formats;</td>
</tr>
<tr>
<td></td>
<td>• developing cultural understanding and global awareness by engaging with learners of other cultures; and</td>
</tr>
<tr>
<td></td>
<td>• contributing to project teams, producing original works, or solving problems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Research and Information Fluency</th>
<th>Be able to apply digital tools to gather, evaluate, and use information by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• planning strategies to guide inquiry;</td>
</tr>
<tr>
<td></td>
<td>• locating, organising, analysing, evaluating, synthesising, and ethically use information from a variety of sources and media;</td>
</tr>
<tr>
<td></td>
<td>• evaluating and selecting information sources and digital tools based on the appropriateness to specific tasks; and</td>
</tr>
<tr>
<td></td>
<td>• processing data and reporting results.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Critical Thinking, Problem-Solving, and Decision Making</th>
<th>The use of critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources by:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• identifying and defining authentic problems and significant questions for investigation;</td>
</tr>
<tr>
<td></td>
<td>• planning and managing activities to develop a solution or complete a project;</td>
</tr>
<tr>
<td></td>
<td>• collecting and analysing data to identifying solutions and/or make informed decisions; and</td>
</tr>
<tr>
<td></td>
<td>• using multiple processes and diverse perspectives to explore alternative solutions.</td>
</tr>
</tbody>
</table>
5. Digital Citizenship

To be able understand human, cultural, and societal issues related to technology and practice legal and ethical behaviour by:

- advocating and practicing safe, legal, and responsible use of information and technology;
- exhibiting a positive attitude toward using technology that supports collaboration, learning, and productivity;
- demonstrating personal responsibility for lifelong learning; and
- exhibiting leadership for digital citizenship.

6. Technology Operations and Concepts

Demonstrate a sound understanding of technology concepts, systems, and operations by:

- understanding and using technology systems;
- selecting and using applications effectively and productively;
- troubleshooting systems and applications; and
- transferring current knowledge to learning of new technologies.

**Literacies based on new media framework**

With funding from the Macarthur Foundation, Jenkins et al (2006) produced a list of digital literacies framework based on the evolution of ICT to help to illuminate this aspect of 21st century learning. In reviewing this framework, Dede (2010) notes the emphasis of Jenkins et al’s (2006) framework is not on proficiency with a tool, but rather on types of intellectual activity performed by a person working with sophisticated ICT. While some typical capabilities are listed (such as judgement), other skills (such as performance) are contextual in their emphasis on new types of 21st century capacities and context. Dede (2010) argues that digital-focused literacies and frameworks they not only represent skills workers and learners should master for effective 21st century work and citizenship, but also describe the learning strengths and preferences people who use technology now bring to educational settings. It could be argued that this particular 21st century skills framework has a direct implication and relevance to professionals in the digital content industry. Table 5 below outlines Jenkins et al’s (2006) framework for new media literacies.
Table 5: New media literacies framework (Jenkins et al., 2006)

<table>
<thead>
<tr>
<th>Skill</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play</td>
<td>the capacity to experiment with one’s surroundings as a form of problem-solving;</td>
</tr>
<tr>
<td>Performance</td>
<td>the ability to adopt alternative identities for the purpose of improvisation and discovery</td>
</tr>
<tr>
<td>Simulation</td>
<td>the ability to interpret and construct dynamic models of real-world processes</td>
</tr>
<tr>
<td>Appropriation</td>
<td>the ability to meaningfully sample and remix media content</td>
</tr>
<tr>
<td>Multitasking</td>
<td>the ability to scan one’s environment and shift focus as needed to salient details.</td>
</tr>
<tr>
<td>Distributed Cognition</td>
<td>the ability to interact meaningfully with tools that expand mental capacities</td>
</tr>
<tr>
<td>Collective Intelligence</td>
<td>the ability to pool knowledge and compare notes with others toward a common goal</td>
</tr>
<tr>
<td>Judgement</td>
<td>the ability to evaluate the reliability and credibility of different information sources</td>
</tr>
<tr>
<td>Transmedia Navigation</td>
<td>the ability to follow the flow of stories and information across multiple modalities</td>
</tr>
<tr>
<td>Networking</td>
<td>the ability to search for, synthesise, and disseminate information</td>
</tr>
<tr>
<td>Negotiation</td>
<td>the ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms</td>
</tr>
</tbody>
</table>

Partnership for 21st century (P21) framework

The Partnership for 21st Century Skills framework (2006) was developed in the US with the goal of positioning 21st century skill and competencies at the centre of education and learning. P21 was a national organisation formed in 2001 and was sponsored by the US government and several organisations from the private sector (such as Apple Computer Inc., Cisco Systems, Dell Computer Corporation, Microsoft Corporation, and the National Education Association). In his review of 21st century skill frameworks, Dede (2010) suggests that P21’s conceptualisation of skills needed for the 21st century is more detailed and more widely adopted than any of the alternatives previously outlined. Table 6 below provides an outline of the P21 (2006) skills framework.
### Core subjects
The core subjects are defined as English, reading, language arts, mathematics, science, foreign languages, civics, government, economics, arts, history, and geography.

### 21st century content
Several significant, emerging content areas are critical to success in communities and workplaces. These content areas are:
- Global awareness;
- Financial, economic, business and entrepreneurial literacy;
- Civic literacy; and
- Health and wellness awareness.

### Learning and thinking skills
As much as students need to learn academic content, they also need to know how to keep learning — and make effective and innovative use of what they know — throughout their lives. Learning and thinking skills are comprised of:
- Critical-thinking and problem-solving skills;
- Communication skills;
- Creativity and innovation skills;
- Collaboration skills;
- Contextual learning skills; and
- Information and media literacy skills.

### ICT literacy
Information and communications technology (ICT) literacy is the ability to use technology to develop 21st century content knowledge and skills, in the context of learning core subjects. Students must be able to use technology to learn content and skills — so that they know how to learn, think critically, solve problems, use information, communicate, innovate and collaborate.

### Life skills
Good teachers have always incorporated life skills into their pedagogy. The challenge today is to incorporate life skills into education and learning. Life skills include:
- Leadership;
- Ethics;
- Accountability;
- Adaptability;
- Personal productivity;
- Personal responsibility;
- People skills; and
- Self-direction.
- Social responsibility

---

**Table 6: P21 skills framework (2006)**
In summary, all these 21st century skills frameworks are generally consistent with each other with some slight differences in additional sub-skills within the P21 (2006) framework and a requirement of foundational knowledge of hardware, software applications, networks and elements of digital technology advocated by ITSE (2007).

Given the variety of frameworks, skill sets and taxonomies that have been identified it is worthwhile noting how they describe some of the more important skills identified by the participants of this study.

**Skills definitions**

The following skills were identified within both the survey responses and the interview transcripts as being the most important for industry professionals: industry trends, business management, communications, creativity, entrepreneurial, technical and technological, software knowledge, and design.

In scanning the various frameworks, skill list and taxonomies three frameworks identified elements of what the interviewees called *industry trends*. For example Binkley et al (2010) suggest people connect with the world and need to consider their place as living in the global world. ITSE (2007) contend that as part of constructing knowledge in the 21st century it is important for workers and learners to identify trends. Jenkins et al (2006) in their list of digital Literacies, argue that people working in and with digital media (content) should possess the ability to pool knowledge and compare notes with others, as it relates to their work.

The notion of technological change and advancement is also described by several writers on the emergence and relevance 21st century skill frameworks. For example Plomp (2013) argues that ICT developments in the second half of the 20th century have changed many societies from an industrial society in which industrial manufacturing was the central focus, into an information society in which dealing with data and information is a key
element in the functioning of most people in their profession. In a similar way Voogt & Roblin (2012) suggest that the rapid development of ICT is continuously transforming the way people work and learn, and they point to a need for the understanding and sourcing of information. It is also argued in the literature that individuals working in the digital content industry are at the technological and innovative forefront, and thus face constant changes and as such they need to maintain currency in their profession (AIMIA, 2005; Haukka, 2011, Higgs, Cunningham & Pagan, 2007; Kerr, 2007). For example, in her study, Haukka (2011) reports a number of issues related to skills deficiencies within Australia’s games industry, one of which was that the rapid pace of technological change meant professionals needed access to some form of ongoing professional currency. Kerr (2007) in a study of games industry in Ireland argues that technology is clearly an important driver of change in the industry in terms of both hardware and software, and based on empirical analysis of the development of games, and skills involved in their development, marketing and distribution highlights the importance of nontechnical knowledge inputs and occupations to the process.

The skill lists and frameworks identified the function of business management in different ways. In the 21st century skills frameworks, P21 (2006) is the only framework that identifies elements of business management as a key skill for workers. They suggest that several content areas are crucial for success in the workplace, one of which is business literacy. Eraut (2004) also lists elements of business management in his skills list. He identifies business skills as comprising delegation, supervision, leadership and prioritisation. NCVER (2003) in their generic skills list, call it ‘planning and organising’, which includes managing time and priorities, and resource management. Based on these definitions, it was determined for this study that these responses would be best defined as business management.

In the area of communication skills the 21st century skills frameworks are explicit in the need for workers and learners to possess communication skills. ITSE (2007) describe how
ICT is central to 21st century work, which has a direct relevance on digital content professionals. In their framework, ITSE (2007) suggest that workers and learners who use and work with digital media environments should be able to effectively communicate with peers, experts and multiple audiences. P21 (2006) group communication skills under the heading of learning and thinking skills and suggest that these type of skills are important throughout a person’s life. The EnGauge (2003) framework is very explicit in the need for what they call effective communication, which includes interactive communication and interpersonal skills.

In the course of the literature review, several writers also point to the need for technological and technical skills as a requirement for those in highly technological and innovative environments. Technical and technological skills are also very prominent in the 21st century skill frameworks. The most poignant commentary, and the one most relevant for the digital content professionals, is described by ITSE (2007). In their framework ITSE (2007) identify the need for workers and learners to possess technology and operations concepts, to be able to demonstrate sound understanding and use of technology systems, and be able to apply current knowledge to new technologies. The need to understand technology was regarded as an argument in the various 21st century skills frameworks, for a person to possess a set of skills that focus on how to effectively understand, select, use and learn about new technologies. Kerr (2007), for example suggests that the digital content industry in Ireland is driven by a focus on technology. This point is further highlighted by Koh, Lee, Yen & Havelka (2004) in their study of skill requirements for professionals in web-based and internet-driven businesses. Koh et al (2004), report that IT professionals are expected to have high levels of technical expertise in various technologies throughout their career.

Design skills were not identified as such in the various frameworks, skill lists and taxonomies. The EnGauge framework (2003) identifies high productivity as a key 21st
century competency and suggests learners and workers should be able to produce relevant high-quality products. In their taxonomy, Mumford et al (1999) under the broader heading of technical skills, identify skills related to the design function, which includes the analysis of requirements, design of items and products, drafting and specifying technical requirements and implementation and testing as the type of skills related to the design function. Forfás (2007), in its definition of digital content industry skills describe design skills as knowing about products and services, and using specialist knowledge in the design process.

Creativity, it is argued is a core skill requirement not just in the broader creative industries (Caves, 2000; Howkins, 2001) but also for those working the digital content industry (AIMIA, 2005; CIE, 2005; Higgs et al, 2007). At a broader skill and competency level, several of the 21st century skills frameworks (such as Binkley et al, 2010; EnGauge, 2007; P21, 2006) identify creativity as an important skill requirement. In their model of 21st century skills, Binkley et al (2010) identify creativity and innovation as the number one skill requirement, and suggest this is related to the way people think. EnGauge (2007), in their framework, call it inventive thinking of which creativity is a key requirement. In a similar way P21 (2006) also link creativity to thinking and also argue that workers should possess creative and innovation skills. The importance and relevance of entrepreneurial skills is highlighted by Maguire, Hogan, O’Donoghue, McQuade & Murphy (2004) in their identification of what they contend are competencies for the next generation of employability skills. They argue that a new set of emerging skills are required for professionals in the key role of information-based technologies and technically-specialised role. In their list of emergent skills they suggest that creativity, innovation and entrepreneurship are needed to design, develop and implement new ideas and concepts.

Finally, entrepreneurial skills were identified in the literature as being a key skill requirement for those working in the creative industries, but, more importantly for those
working in the micro businesses (Raffo, Lovett, Bank, & O'Connor, 2000). They suggest that people working in technical and innovative type of businesses must possess entrepreneurial skills. Raffo et al (2000) argue that entrepreneurial skills are a particularly important requirement for micro businesses if they are to compete and survive in fast-changing, highly competitive markets. With respect to the skills frameworks, P21 (2006) identify entrepreneurial skills as a key requirement for worker in the 21st century. They argue this is an emerging content area that includes entrepreneurial literacy.

An important aspect of the attributes of individual workers relevant to work, that relates to competence and capabilities in the literature, is the skill base or underlying learning that is considered necessary to achieve prescribed outcomes. The main skills referred to in the literature that underpins competence, capabilities and capacities can be categorised as learning to learn, or meta-cognitive skills. A description and outline of metacognition and learning to learn will now be provided.

**Learning to learn and metacognition**

Learning to learn cannot be considered a single entity or skill but a family of learning practices that enhance a person’s capacity to learn. It is based on the concept that encompasses and draws on a number of ideas, which include metacognition (the learner’s knowledge and regulation of the cognitive process), thinking skills, self-regulation, self-efficacy and self-esteem (see Claxton, 2002; Hargreaves, 2004; Rademacher, 2004). It is also tied to the development of meta-cognitive skills and techniques as well as a person’s independence and motivation to learn (Hautamaki et al, 2002; Sternberg, 1998). In fact it has been suggested that learning to learn is one of the core functions of 21st century learning and as such learner’s will need to become more effective, efficient and more resilient learners due to the increasing pace of technological and cultural change (see Cobo, 2012; Dede, 2010; Higgins, 2009). Therefore learning to learn is about learning to make choices about what to
learn and how to learn which involves the development of specific skills as it relates to a person’s approach to learning.

Saljo (1979) argues that learning is no longer conceived as an activity of reproducing but, instead as a process of acquiring, analysing and interpreting information by “making meaning” (p.16). Smith (1982) suggests that it could be interpreted as meaning that learners and, indeed, adults in general forget to apply and continually improve their learning skills and/or lose interest or motivation to learn. Learning to learn is also defined as:

... the willingness to adapt to novel tasks. A task is seen to activate a complex system of interrelated competencies and beliefs, leading to learning action. The adaptive and voluntary mastery of this learning action through effective and cognitive self-regulation forms the core of learning-to-learn. (Hautamäki et al., 2002, p.3)

Burns (2002) also argues that it requires the learner to possess a self-conscious awareness of how they come to know what they know, and an awareness of the reasoning. Miller (1964) and Smith (1982) build on the notion of learning to learn by stating that there are a number of variables that determine how someone learns. These variables include the nature of the learning task, the learner’s level of learning readiness, the learner’s learning style, and the learner’s previous experience and knowledge. Another view is offered by Hargreaves (2004), who argues that learning to learn is not a single skill in itself but a family of learning practices that enhance a person’s capacity to learn. Smith (1982) also explores the concept of learning to learn in relation to adult learning. He states that learning how to learn involves processing or acquiring the knowledge and skills to learn effectively in any learning situation. Salomon & Perkins (1998) also identify learning to learn in terms of social learning. In their view, the importance of the social dimension involves learning to learn in ways that participate in and capitalises on social settings and interactions. In sum according to Entwistle & Ramsden (1983) learning to learn is based on knowledge transformation and
depends, in part, on the nature of two broad concepts in the relationship between the learner’s goals and the use of different learning strategies: deep-processing strategies which include discriminating important information and trying to figure out how new information fits with what the learner already knows; and surface-level strategies such as reading material and simply extracting meaning from text. Entwistle & Ramsden (1983) surmise that these concepts influence the learner’s range of learning strategies as well as the best approach to take to realise their learning goals. This is of great relevance to this study as the notion of informal learning is based on elements of social interactions and relationships.

Closely related to learning to learn is metacognition and is described as the awareness and conscious use of psychological processes of perception, memory, thinking and learning, and the knowledge of tasks as it relates to a person’s own performance (Brown, 1978; Flavell, 1979). Metacognition also refers to the evaluation and control of person’s cognitive processes or knowing about knowing (Brown, 1978; Flavell & Wellman, 1977). More broadly it is also suggests that metacognition is about the conscious control of learning, planning and selecting learning strategies, self-assessment and review of learning strategies, reflection on learning, and includes a feedback mechanism for performance improvement (see Brookfield, 1986; Glaser, 1984; Veenman, Van-Hout Wolters, & Afflerbach, 2006).

The literature on metacognition is quite large and focuses on the psychological and socio-cultural approaches of learning. A range of writers (for example Kirkwood, 2000; Markman & Flavell, 1979; Gentner, 2000; Nuthall, 1999; Pressley & Brainerd, 1985; Resnick, 1987) emphasise elements of psychological models of learning such as memory and concept forming and higher order thinking. While others (such as Claxton, 1998; Salomon & Perkins, 1998) discuss the socio-cultural aspects of learning which focuses on the learners ability to think about how they learn and develop their learning skills to engage in effective job related learning. Veenman et al (2006) argue that metacognition relates to the awareness
of the learner to be able to monitor their own learning by using different learning strategies, and that it is related to the thinking process related to learning such as study skills and memory capabilities.

In a similar way Anderson (2008) and Johnson (1997) argue that metacognition refers to the awareness of our own thinking processes while performing specific tasks, or as Wang, Haertel, & Walberg (1990) suggest, metacognition can be a powerful predictor of learning. This is an important factor in intelligence, learning and problem-solving. Johnson (1997) for example argues that metacognition involves the planning that takes place before a person begins a thinking activity, the regulation of thinking they work through the activity, and evaluation of the appropriateness of the thinking after completing the activity. Anderson (2008), on the other hand, highlights several factors that impact on the learner’s ability: knowledge about their particular work-related tasks such contextual knowledge and self-knowledge which involves the critiquing of one’s own knowledge level.

Some writers (for example Entwistle & Ramsden, 1983; Pressley & Brainerd, 1985) advocate the views that this process can be achieved through an introduction to alternative learning styles, self-assessment and specific industry related training to help them to learn. Meta-cognition, then, can be summed up as: (1) what learners know about themselves and others, (2) learning experiences through a set of activities that help learners control their own learning, and (3) the level of thinking involved in learning situations. Ultimately metacognition is concerned with knowledge about cognition and the regulation of cognition process that are tied to the learning process.

The skill of learning to learn is also identified in several of the skill lists and frameworks. The early skill sets and taxonomies (such as Eraut, 2004; NCVER, 2003; Mumford et al, 1999) identify learning as a required skill and recognise that learning is a continual process. NCVER (2003) identify that learners and workers need to possess skills
such as using a range of mediums to learn, and apply learning to technical issues and operations.

In the 21st century skills frameworks, learning to learn is prominent and is considered an important skill for workers and learners in the 21st century. Binkley et al (2010) assert that learners and workers need to identify ways of thinking, of which learning to learn and metacognitive skills are critical. These skills, they suggest, emphasise the upper end of thinking skills. In a similar way, EnGauge (2003), in their skills framework for workers in the 21st century, call it higher order thinking and sound reasoning. P21 (2006) also argue for the need of learners and workers to know how to learn. In their skills framework, P21 (2006) suggest that learning to learn skills include critical-thinking and problem-solving, communication, creativity and innovation, collaboration, contextual learning, and information and media literacy skills.

In summary, the literature clearly shows that workers are required to consciously think about how they learn and develop their learning skills to engage in effective learning. Some authors (such as Anderson, 2008; Entwistle & Ramsden, 1983; Pressley & Brainerd, 1985; Saljo, 1979) advocate the view that this process can be achieved through alternative learning styles and self-assessment, while others (see Binkley et al, 2010; EnGauge, 2003, P21, 2006) suggest that learning to learn is an important and ongoing skill requirement for workers and learners in the 21st century. These two theories have great relevance to this study as it suggests that learners and, indeed, worker’s need to develop their learning skills while also consciously thinking and planning their learning activities as they relate to their ongoing professional currency.

**Capabilities and skills of industry professionals**

It is argued by a number of writers (for example Caves, 2000; Cunningham, 2002, 2013; Hartley, 2007; Potts et al, 2008; Suciu, 2008) that creativity is at the core of digital
content industry’s activity, along with technical and business capabilities and skills. This would typically include technical skills development, the development of general business acumen skills through a formal education course, or it could be that through some other form of education and training, or through learning networks, individuals may identify other pathways for movement within the broader digital content industry (AIMIA, 2005). To this end, Forfas, Ireland’s Policy Advisory Board for Enterprise, Trade, Science, Technology and Innovation (2007), through a consolidation and review of a number of competencies and skills frameworks from around the world, identify the main elements of skills required by an individual working in a highly technological and innovative environment. They identify three main groupings of skills: (1) generic skills such as using technology and technical skills, (2) people-related skills such as team-work, and communication, and (3) conceptual skills such as innovation, planning and organising. Finally, according to AIMIA (2005) and Goldsmith (2013) the core skills required for working in the digital content industry are design and creativity, management, marketing and sales, software development and finance skills.

Poell, Chivers, Van der Krogt, & Wildermeersch (2000) recognise the development of an individual’s competencies and skills. They write “employees ... would profit more from developing a broad set of professional qualifications enabling them to perform work in a variety of companies Employees who are well embedded in their professional discipline have more possibilities to stay employed in interesting jobs” (p.31). So, based on this the skills and professional development path for the participants of this study were personal to that individual as being important for their development and for maintaining currency within the digital content industry.

There are reported skill and capability deficits in the digital content industry. In their 2005 study, AIMIA found that a quarter of the digital content sector businesses surveyed had difficulty getting staff, which they say is due to the lack of skills within the available
workforce, particularly in creative and management skills. Much in the same way, CIE (2005) contend that industry leaders find that students leaving universities or institutes of technology are frequently not industry-ready, lack business and project management skills, and require further specialised training. CIE (2005) also suggests that the lack of critical mass of talent may discourage multinational firms from establishing labs and regional offices in Australia, which could impact Australia’s economic performance. In fact, one animation and visual effects company responded to AIMIA’s (2005) study notes by saying “ours is a very difficult industry to recruit in. Our ideal candidate has a mix of arts, psychology, design and IT background” (p.40). The development of ideas through creativity, to turn these ideas into real applications that offer commercial appeal, raises a number of issues for businesses and for the skills needed by their employees, such as financial, technical, business and creative skills, and the assertion of intellectual property (AIMIA, 2005).

Consequently, businesses operating in the digital content industry require creative staff to possess a high level of commercial, marketing and management skills. However, while these skills are in high demand, they are in short supply (AIMIA, 2005). It is also reported that development of a broad skill base is required to successfully work in the digital content industry. Universities and Technical and Further Education (TAFE) institutions are not considered able to produce graduates with sound technical, creative, business or team skills (AIMIA, 2005). The report suggests that graduates tend to overestimate their own capabilities and have not been adequately prepared for the fact that technicians need more than software competence to be effective team members, and they rarely have the requisite project and business skills.

In scanning the literature for this study, the researcher identified that a major study was required which looked to identify and evaluate the skill sets and occupations required for employment in Australia’s digital games industry, whilst also measuring the extent, source
and impact of skills deficiencies (Haukka, 2011). The report highlights a number of issues related to skills deficiencies within Australia’s games industry: the rapid pace of technological change means professionals need access to some form of ongoing education and training, the importance of non-technical skills, and a lack of experience and skills within the local available workforce that results in expensive and time-consuming overseas recruitment. These points are significant for this study as there is a lack of research and literature on the skills needed in the digital content industry, as well as a lack of empirical evidence of how individuals within the industry continue and progress their skill and professional development.

McWilliam (2008) notes that student capacities in such domains as digital, interpersonal and business are not usually acquired through formal education. She identifies a set of “new basics” (p.84-85) that are relevant to work and learning: career management, project management, entrepreneurship, project-based work teams, and learning to learn (the self-managed learner). This is an important point, as it pertains to the broad intent of this research study of how professionals, owners and managers working in the digital content industry must engage in self-managed learning to develop and contribute to the skill professional development to maintain their currency in the industry. Finally, it has been argued that these individuals do not have access to a human resources, or learning and development, section that can typically arrange and plan their learning pathways.

Mechanisms for professional learning in the digital content industry

The literature reviewed in this section will provide grounding in the two key approaches that workers in the digital content industry can access for their skill and professional development: formal education and training, and informal learning.
Formal education and training

Formal education and training is usually classroom based, is highly structured is important for providing learning outcomes for students, the development of specific competencies and the development skills (Johnson, 1997). The importance of formal education and training is such that it has a curriculum that contains endorsed national competency standards and assessment guidelines that align to nationally accredited qualifications at different levels of the Australian Qualifications Framework (AQF). For the purposes of this study, formal education and training will be discussed in terms of accredited courses offered by universities, vocational education and training providers, short courses, and internally offered training opportunities (AIMIA, 2005; CIE, 2005; Eraut & Hirsch, 2007; Haukka, 2011).

A key consideration in researching the courses and qualifications offered and delivered in the formal education and training sector in Australia is the distinction between accredited and non-accredited courses. According to Australian Skills Quality Authority (ASQA, 2014) an accredited course is one where a student gains a nationally recognised qualification or statement of attainment, meets an established industry, enterprise or educational need, leads to a qualification aligned to the AQF, and is regulated and audited under government guidelines. On the other hand, a non-accredited course does not lead to a formal qualification or statement of attainment, is not recognised outside of a particular company or organisation, and the education and training is not regulated by industry and government quality assurance requirements. It should be noted that the courses and qualifications listed in the following sections are for accredited courses only.

University education

In the higher education sector there are a number of courses and qualifications that are relevant the digital content industry. They are divided into nine main categories: animation
and games, graphic design, digital media, information technology, web and mobile media, video and motion graphics, music and audio, business management, and internet and social marketing (AIMIA, 2010; Innovation and Business Skills Australia, IBSA, 2009).

Approximately 65 such courses and qualifications comprising undergraduate, honours level and post graduate level courses are offered at various higher education institutions. Some examples of these qualifications include the Bachelor of Arts (Film, TV and New Media), Bachelor of Computer Science (Games), Bachelor of Creative Technology, Bachelor of Creative Technology (Audio Engineering), Bachelor of Design (Multimedia Systems), and Bachelor of e-Marketing (Australian Council for Educational Research, ACER, 2010; Haukka, 2011; IBSA, 2009). Table 7 below outlines the number of courses related to the various sectors within the digital content industry.

Table 7: Breakdown of university courses by digital content industry sector (ACER, 2010; Haukka, 2011; IBSA, 2009)

<table>
<thead>
<tr>
<th>Digital Content Sector</th>
<th>Number of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation and games</td>
<td>14</td>
</tr>
<tr>
<td>Business management</td>
<td>6</td>
</tr>
<tr>
<td>Graphic design</td>
<td>5</td>
</tr>
<tr>
<td>Digital media</td>
<td>9</td>
</tr>
<tr>
<td>Information Technology</td>
<td>15</td>
</tr>
<tr>
<td>Internet and social media</td>
<td>5</td>
</tr>
<tr>
<td>Video and Motion graphics</td>
<td>3</td>
</tr>
<tr>
<td>Music and audio</td>
<td>4</td>
</tr>
<tr>
<td>Web and Mobile media</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>65</strong></td>
</tr>
</tbody>
</table>

In the Department of Education, Employment and Workplace Relations (DEEWR, 2010) report for the year ending 2009 there were 81,210 people enrolled in higher education courses across the nine categories of courses and qualifications related to the digital content industry. Additionally, ACER (2010) report a completion rate (number of students who
graduated from a higher education institution) of 70 per cent for the year ending 2009, which suggests that approximately 56,845 people graduated with a higher education qualification related to the digital content industry. It should be noted that the figures cover the entire range of courses and were broken down to individual sectors.

In scanning the literature and reviewing the skills addressed by the higher education institutions, AIMIA (2010) and IBSA (2009) identified the key skills and outcomes for each of the courses offered by higher education institutions that are related to the digital content industry, and is shown below in Table 8.

**Table 8: Outline of university courses by digital content industry sector (AIMIA, 2010; IBSA 2009)**

<table>
<thead>
<tr>
<th>Digital Content Sector</th>
<th>Key skills addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation and games</td>
<td>The courses in the sector address a number of skills and techniques relevant which includes animation effects, games design, 3D, visual effects, visuals, architecture and interactivity, the use of software in animation, industrial design, entertainment effects, and real-time studio work.</td>
</tr>
</tbody>
</table>
| Business management          | The content in these courses address a number of business areas:  
• broad business knowledge from finance, accounting and economics, marketing and data analysis;  
• generic skills in all areas, and gain an understanding of how businesses operate within the commercial and legal environment;  
• strategy, leadership and internationalisation;  
• entrepreneurial thinking to enhance your business planning capabilities;  
• human resource management; and  
• strategic, operations, and project management. |
<p>| Graphic design               | These courses focus on traditional design in areas such as designs, marketing, branding and campaigns, content production, visual effects, and real-time and virtual environments modelling. |</p>
<table>
<thead>
<tr>
<th><strong>Digital Content Sector</strong></th>
<th><strong>Key skills addressed</strong></th>
</tr>
</thead>
</table>
| Digital media | The content in this set of courses explore the connections between technology and the creative arts and the ways in which digital media is used in society and the workplace. It focuses mainly on:  
  - multi-media design and culture, and creative teams;  
  - production, including the operation of software and hardware, as well as the ability to plan, develop and complete a digital media product;  
  - screen, digital media, social and cultural applications; and  
  - experience in the creative process and the ability to apply logical thought, analysis and research skills. |
| Information Technology | This set of courses covers wide range of skills related to the both the software and hardware skills. These skills include:  
  - application development;  
  - software development and testing;  
  - network design and testing;  
  - system and database development and design;  
  - ICT business development; and  
  - system engineering and architecture. |
| Internet and social media | These sets of courses focus on the application and interaction of social media within the internet application setting. The skills addressed by these courses include such areas as multimedia design, interactive design and implementation, the design and use of social media, and web design. |
| Video and Motion graphics | The skills addressed within this set of courses cover the following areas:  
  - producing, writing, and editing,  
  - cinematography and directing, and public screenings;  
  - industry focused expertise;  
  - business and leadership skills;  
  - formats application which include film, television, HD digital and mobile platforms; and  
  - genre specific content including documentary, drama, and television formats. |
### Digital Content Sector

<table>
<thead>
<tr>
<th>Key skills addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses in the sector cover areas including:</td>
</tr>
<tr>
<td>• design, editing, and mixing;</td>
</tr>
<tr>
<td>• audio planning and scheduling;</td>
</tr>
<tr>
<td>• digital formats mp3 and mp4;</td>
</tr>
<tr>
<td>• use and application related to radio, film and television, web applications and games.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Web and Mobile media</th>
</tr>
</thead>
<tbody>
<tr>
<td>The courses in the sector address a number of skills and techniques relevant web and mobile media technology. These include:</td>
</tr>
<tr>
<td>• web design;</td>
</tr>
<tr>
<td>• mobile platform technology;</td>
</tr>
<tr>
<td>• web platforms such as HTML and android;</td>
</tr>
<tr>
<td>• programming of web platforms; and</td>
</tr>
<tr>
<td>• use of search engines and optimisation.</td>
</tr>
</tbody>
</table>

### Vocational education and training

The vocational education and training sector is differentiated from the higher education sector by its focus on training for skills development, manual or practical activities. It is traditionally non-academic and is typically related to a specific trade, occupation, or vocation (DEEWR, 2003). It should be noted that vocational education and training in this sector is offered by TAFEs, RTOs, Adult and Community Education (ACE) colleges, professional associations, and secondary high school programs called vocational education and training (VET) in schools (IBSA, 2010).

IBSA is one of eleven industry skills councils responsible for building capability, professionalism and innovative capacity in Australia’s workforce through consultation on the skills needed in six industry sectors, of which four are particularly relevant to the digital content industry: business services, information technology, cultural industries, and printing and graphic arts. Given IBSA’s charter and industry responsibilities as a major stakeholder in fostering the digital content industry sector, they are also instrumental in the development of
national curriculum, standards, qualifications, learning resources and training packages related to the digital content industry.

According to IBSA (2009) there are a number of competencies and qualifications that describe the various occupations within the digital content industry that are covered by a national curriculum. The occupations these competencies and qualifications cover are: game design, digital media design, game art and animation, 3D and digital effects, interactive media, virtual worlds, multimedia development, web development, programming, games production and testing, management functions which include business, legal, marketing, sales and service, production, and quality assurance. The broad set of competencies described by IBSA (2009) aligns to the list of sectors described by Higgs & Kennedy (2004) and the generic skill set discussed by AIMIA (2005).

IBSA (2009) identifies four main qualification or training packages of competencies for the digital content industry:

- BSB07 - Business Services;
- CUF07 - Screen and Media;
- ICA05 (soon to be ICA10) - Information and Communications Technology; and
- ICP05 - Printing and Graphic Art. (p.6)

A complete list of the competencies and qualifications is identified by IBSA (2009) as being the most relevant to the digital content industry from the Australian Qualification Framework (AQF). The competencies by IBSA (2009) were within the nationally endorsed CUF (Screen and Media), ICA (Information and Communications Technology), and ICP (Printing and Graphic Art) training packages, which offer qualifications that would typically be available from TAFEs, Registered Training Organisations (RTOs), and some universities in Australia, ranging from Certificate I to Advanced Diploma (level 6).
Additionally, IBSA (2009) state that in-keeping with the development of vocational education required by businesses to foster new ideas and to build capacity within the digital content industry which in turn supports Australia’s economic competitiveness, they developed 28 units of competency called Creative Thinking, Design and Innovation. It comprises eleven (11) qualifications that cover the areas of micro business operations, customer contact skills, administration, education, and organisational learning and capability development.

Quite significantly, there are two qualifications that are relevant to owners/managers of digital content businesses in their capacity of assisting in the skill and professional development of themselves and their staff: the Vocational Graduate Certificate in Management and Vocational Graduate Diploma in Management Learning. These qualifications focus on the organisational learning and capability development area. According to (IBSA, 2009), the Graduate Certificate and the Graduate Diploma reflect the roles of individuals who apply knowledge and skills in the field of learning and who assist in capability development of their staff. IBSA (2009) describe both qualifications as being suitable for leaders and managers in an organisation where learning is used to build capability to enhance existing practices and thinking, and workforce capability development of managers providing career and professional development.

In reviewing the enrolment and completion rates within the tertiary education sector for the year ending 2008, IBSA (2010), who state that this is the most recent data available, report there were approximately 135,000 participants across the nine categories of courses and qualifications related to the digital content industry. IBSA (2010) also report that the number of students who graduated from a vocational education institution for the year ending 2008 was 35 per cent, which would represent a total of approximately 47,250 people within the digital content industry that graduated with a vocational education qualification for the
year ending 2008. Table 9 below provides a breakdown of participants and the number of graduates for each of the nine sector courses relevant to the digital content industry.

**Table 9: Breakdown of vocational education by digital content industry sector (IBSA, 2010)**

<table>
<thead>
<tr>
<th>Digital Content Sector</th>
<th>Number of participants</th>
<th>Number of completions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation</td>
<td>1,500</td>
<td>525</td>
</tr>
<tr>
<td>Film and TV</td>
<td>6,300</td>
<td>2,205</td>
</tr>
<tr>
<td>Games</td>
<td>400</td>
<td>140</td>
</tr>
<tr>
<td>Graphic design</td>
<td>28,000</td>
<td>9,800</td>
</tr>
<tr>
<td>Information Technology</td>
<td>49,000</td>
<td>17,150</td>
</tr>
<tr>
<td>Marketing</td>
<td>27,600</td>
<td>9,660</td>
</tr>
<tr>
<td>Sound and audio</td>
<td>4,790</td>
<td>1,677</td>
</tr>
<tr>
<td>Visual arts</td>
<td>3,300</td>
<td>1,155</td>
</tr>
<tr>
<td>Web and Mobile media</td>
<td>14,110</td>
<td>4,939</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>135,000</strong></td>
<td><strong>47,250</strong></td>
</tr>
</tbody>
</table>

**Professional short courses**

Through professional associations, TAFEs, ACE colleges, RTOs, and some universities, professional short courses, also called professional development courses, are offered for industry professionals, to provide them with current practices, trends, skills and techniques needed to maintain their currency within the digital content industry (AIMIA, 2010; IBSA, 2009). The short courses offered by a number of these tertiary institutions cover the broad range of sectors and occupations in the digital content industry, including animation, games, marketing, film and TV, graphic design, information technology web and mobile media, and visual arts.

Typically these courses are delivered over a period of between one and seven days. AIMIA (2010), Haukka (2011), and IBSA (2009) identify a total of 68 professional development short courses related to the digital content industry that are offered by a number
of private colleges, universities and TAFEs. Some of these courses include 3D studio, digital marketing, iPhone, iPad and Android development, Java programming, SQL databases, Social media marketing, and various computer software packages such as Adobe CS4, Illustrator, and Photoshop. A breakdown of professional development short courses by industry sector has been provided below in Table 10.

Table 10: Breakdown of short courses by digital content industry sector (AIMIA, 2010; Haukka, 2011; and IBSA, 2009)

<table>
<thead>
<tr>
<th>Digital Content Sector</th>
<th>Number of courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation</td>
<td>7</td>
</tr>
<tr>
<td>Film and TV</td>
<td>4</td>
</tr>
<tr>
<td>Games</td>
<td>9</td>
</tr>
<tr>
<td>Graphic design</td>
<td>8</td>
</tr>
<tr>
<td>Information Technology</td>
<td>13</td>
</tr>
<tr>
<td>Marketing</td>
<td>8</td>
</tr>
<tr>
<td>Sound and audio</td>
<td>4</td>
</tr>
<tr>
<td>Visual arts</td>
<td>10</td>
</tr>
<tr>
<td>Web and Mobile media</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

At the time of the literature review, no data was able to be sourced on the number of enrolments and the number of graduates of the professional short courses, despite a number of attempts to contact several leading short course providers.

AIMIA (2010) and IBSA (2009) outline the key skills and techniques addressed by the professional development short courses related to the digital content industry that are offered by a number of RTOs and which are shown below in Table 11. The table of skills and techniques outlined below was sourced initially through identifying the providers that offered the various courses noted by AIMIA (2010), Haukka (2011) and IBSA (2009), then the details of each course were further developed by investigating the websites of each of the
providers, which included TAFEs, private colleges, and, in some cases, universities from across the country. The list of skills outlined below in Table 11 is a composite list from all the providers that were reviewed and covers the nine sectors within the digital content industry.

*Table 11: Outline of professional development short courses by digital content industry sector (AIMIA, 2010; IBSA, 2009)*

<table>
<thead>
<tr>
<th>Digital Content Sector</th>
<th>Key skills addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation</td>
<td>The skills addressed in this range of courses include:</td>
</tr>
<tr>
<td></td>
<td>• online portfolios;</td>
</tr>
<tr>
<td></td>
<td>• folio preparation for visual artists;</td>
</tr>
<tr>
<td></td>
<td>• lighting and rendering;</td>
</tr>
<tr>
<td></td>
<td>• character creation and design in 3D Studio Max;</td>
</tr>
<tr>
<td></td>
<td>• advanced sculpting techniques and workflows;</td>
</tr>
<tr>
<td></td>
<td>• 3D software techniques; and</td>
</tr>
<tr>
<td></td>
<td>• modelling, production, and architecture.</td>
</tr>
<tr>
<td>Film and TV</td>
<td>This set of courses mainly focus on editing skills and techniques which include:</td>
</tr>
<tr>
<td></td>
<td>• Final Cut Pro Fundamentals;</td>
</tr>
<tr>
<td></td>
<td>• Video Post Production in Final Cut Pro Studio</td>
</tr>
<tr>
<td></td>
<td>• Digital Storytelling; and</td>
</tr>
<tr>
<td></td>
<td>• Motion Graphics/Animation in Adobe After Effects;</td>
</tr>
<tr>
<td>Games</td>
<td>The short courses cover a range of technical skills and techniques which cover</td>
</tr>
<tr>
<td></td>
<td>• 3D Studio Max;</td>
</tr>
<tr>
<td></td>
<td>• Z Brush Beginner and Advanced</td>
</tr>
<tr>
<td></td>
<td>• Maya Basics, and Characters;</td>
</tr>
<tr>
<td></td>
<td>• Autodesk Softimage XSI Beginner;</td>
</tr>
<tr>
<td></td>
<td>• Introduction to Motion Capture; and</td>
</tr>
<tr>
<td></td>
<td>• iPhone, iPad and Android Development using Unity.</td>
</tr>
<tr>
<td>Graphic design</td>
<td>This range of short courses focus on a number of skills which include:</td>
</tr>
<tr>
<td></td>
<td>• InDesign Fundamentals and Advanced;</td>
</tr>
<tr>
<td></td>
<td>• Illustrator Fundamentals and Advanced;</td>
</tr>
<tr>
<td></td>
<td>• Photoshop Fundamentals and Advanced;</td>
</tr>
<tr>
<td></td>
<td>• Adobe Acrobat; and</td>
</tr>
<tr>
<td></td>
<td>• Portfolio development presentation.</td>
</tr>
<tr>
<td>Digital Content Sector</td>
<td>Key skills addressed</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
| Information Technology | The range of IT short courses is primarily focused on the use of a range of software and some network operations and management techniques. These include:  
- Java and JavaScript programming;  
- web pages with AJAX and cloud computing;  
- programming in C and C++;  
- Linux systems administration;  
- programming languages;  
- managing and using Share Point;  
- SQL and UNIX Server; and  
- Developing Windows and Web Applications using Visual Studio.NET (C# and VB.NET). |
| Marketing | These short courses address a number of key skills required in the digital marketing area. These include application of social media marketing, digital marketing and advertising, strategy development, writing copy, direct mail using the web, database marketing, and business to business strategies on the web. |
| Sound and audio | The courses in this area focus on audio and sound skills and cover recording studio intensives, Live Sound Intensive, audio production and MIDI sequencing in Logic Pro 9, and audio production and recording in Pro Tools. |
| Visual arts | Courses related to the visual arts focus mainly on art and portfolios, and the courses provide professionals with skills such as  
- digital photography  
- life drawing;  
- printmaking for beginners  
- printmaking for projects;  
- painting techniques; and  
- drawing in the City. |
| Web and Mobile media | In this set of short courses the focus is on the skills and techniques needed in the changing world of the internet and mobile platforms. This includes areas such as Dreamweaver, JavaScript and Cascading Style Sheets (CSS), iPhone, iPad and Android development, the use of Flash software, and Web 3.0. |

In summary, formal education and training in Australia is offered through three areas: higher education institutions, typically delivered by universities, TAFEs and RTOs, each
offering a mixture of degree level, vocationally focused qualifications and professional
development type courses. A distinction can be drawn across the three arms of Australia’s
training system.

Higher education or degree level courses are typically delivered over a longer period
of time (3 to 6 years) and focus on a broader body of knowledge learning. Conversely,
courses and qualifications offered by vocational education providers such as TAFEs, RTOs
and private colleges, typically emphasise technical skills and competencies related to a
specific occupation or profession and are delivered over a shorter timeframe of between 6 to
12 months. Finally, short courses tended to relate mainly to ongoing professional
development and focus on specialist types of skills, industry practices and techniques to build
expertise and knowledge related to an occupation.

Organisational facilitated learning

The final approach to formal education and training is that which Eraut & Hirsch
(2007) describe as organisational facilitated learning, which is typically planned and managed
by a human resources or learning and development section within a large business or
organisation.

In developing and identifying an approach to learning and training by an organisation
or business, Eraut & Hirsch (2007) outline four key steps that are typically undertaken: a
training needs analysis, training plans are developed, response to individuals needs, and the
training activity is completed.

Eraut & Hirsch (2007) outline a number of approaches to organisational facilitated
learning that is typically utilised by larger businesses and organisations. These include:

- Personalised and tailored learning plans;
- Training courses and workshops;
- e-learning or online learning, and access to study materials;
• Blended learning, which combines both online and face-to-face learning;
• Employer support for educational qualifications;
• Coaching and mentoring programs;
• Action learning with peer support, and
• Project-based learning in teams.

Organisational facilitated learning is important in the digital content industry because, as was identified previously, the industry is made up of over 300 large businesses, and these types of learning approaches would typically be utilised by them to be delivered to large numbers of employees (Eraut & Hirsch, 2007). However, micro businesses and, indeed, small businesses often do not have access to a human resources or learning and development sections to assist with their professional development, and must therefore rely on informal learning mechanisms. Typically, informal learning can be described as involving casual discussions, engaging with social and business relationships, and even sharing knowledge within a group or team (Billett, 2001; Dale & Bell, 1999; Eraut & Hirsch, 2007; Marsick & Watkins, 1990). Even in larger firms, informal learning is an important way for staff members to maintain their currency within their field (Eraut & Hirsch, 2007). Informal learning, then, is important for developing an individual’s professional and industry specific skills in a responsive, just-in-time or learning on demand mode (McLoughlin & Lee, 2007). McLoughlin & Lee (2007) suggest that learners are taking advantage of digital and networked technologies in order to address a problem at work and to seek and share information. This mode of learning will be explored later in relation to the learner’s need for timely information by accessing various forms of online resources.

**Informal learning**

This section reviews the literature on informal learning. The body of literature highlights how workplace learning can be conceptualised as a social system where workers
develop and create a context for informal learning. In this section, three main perspectives will be addressed: informal learning as a social system, situated learning, and self-directed learning.

Not all adult learning takes place in the formal classroom setting; considerable learning takes place outside the confines of the formal education arena (Brookfield, 1986). It can include self-directed learning, networking, social interaction, and conversations and team work (Marsick & Watkins, 1990). Eraut (2004) identifies three levels on which informal learning is based: deliberative learning (projected learning), reactive learning (spontaneous, in which the level of intentionality varies according to situation and context), and implicit learning (in which there is no intention and awareness to learn. Therefore, informal learning can occur in a variety of places, such as the workplace, through daily interactions and shared relationships.

Writers such as Billett (2001, 2002, 2007), Dale & Bell (1999), Eraut (2000), Marsick & Watkins (1990) consider the relationship between the learner and the environment and acknowledged that much of the learning occurring in the workplace took place through interaction with others. Additionally informal learning is represented by a range of strategies including casual conversations, social interactions, team work, and mentoring.

Informal learning has been defined by many authors and researchers in a number of ways however it is most frequently used to describe learning via experience, guidance, coaching, modelling or mentoring as opposed to involvement in a specific facilitated program of learning or development. Bell (1977) defines informal learning as “planned learning which occurs in a setting or situation without a formal workshop, lesson plan, instructor, or examiner” (p.280). According to Marsick & Watkins (1990) informal learning may include self-directed learning, networking, trial and error that can occur at any time. They also write about ways of increasing workplace efficiency and emphasise the need for employers to
recognise the benefits of informal learning as opposed to formal learning activities. Billett (2001) and Bell & Dale (1999) also describe the value of informal learning in terms of workplace practice. They argue that learning through work, and in work and job contexts through some form of informal interaction, the learner can acquire and develop their skills and knowledge. In the same vein Billett (2002) also suggests that informal learning in the workplace not only promotes practical skills, intra - and interpersonal skills, and cultural awareness, it can also be considered needs-specific and highly relevant, is incrementally based upon the individual’s learning needs, it provides outcomes specific to individuals needs, and participation needs to be enduring in order to learn richly as well as remain engaged with the changing requirements for the learners workplace practices. In fact, Billett (2004) argues for the ongoing development of an individual’s professional skills, either technical or non-technical. He writes that considerations of the individual’s engagement in workplace activities and access to it may inform a broader view of their learning experiences and their enhancement. He also links professional development, and indeed the process of workplace learning to the consideration, requirement and needs of the individual’s vocational skills. Much in the same way Gourlay’s (2002, 2004) review of research studies from different disciplines characterises the acquiring of skills and professional development as personal, experience based, job specific, and can be transferred through social and business relationships. Dale & Bell (1999) also consider the importance of informal learning in the context of the work function and job performance. They argue that such learning is not formally integrated into a learning program or activity by the employer and that informal learning may be motivated by everyday activities such conversations and social and business interactions. The views offered by these writers have a significant impact on this study with respect to how individuals working in micro businesses in the digital content industry continue their skill and professional development through informal learning. It highlights the
role of informal learning as a model for skill development, as well as the role that social and business relationships play for the individual in continuing their development.

Continuous learning is important for skills currency and formal learning may not always be able to provide this. According to Argote (1999) continuous learning throughout one’s career has become essential to remain relevant in the workplace. Argote (1999) adds that simply summing individual learning is inadequate to model learning in the workplace. The key to workplace learning, Argote (1999) asserts is it actively creates, captures, transfers, and mobilises knowledge to enable it to adapt to a changing environment.

Many writers of workplace learning consider the notion of informal learning to be a socially constructed phenomenon, and therefore emphasise the understanding of the context of the learning, in this case, the workplace, and the prevailing culture (for example Billett, 2001, 2002; Dale & Bell, 1999; Eraut, 2000; Marsick & Watkins, 1990; Wenger, 1999). Billett (2002) writes “... the contribution of a workplace’s physical environment provide important clues, and models that assist individuals’ thinking and acting and their learning and understanding” (p.64). Many approaches to facilitating workplace learning have been identified, and were particularly aimed at the sharing of knowledge and expertise of those experienced within the workplace (Smith, 2001). The idea of skills acquisition through informal learning in a socially-mediated way of sharing knowledge was reported in a study by McCall, Lombardo & Morrison (1988) of managerial learning. It revealed that the development and acquisition of managerial skills were predominantly developed through informal learning. They found that out of the thirty-five managerial job related skills, managers reported having developed thirty of them through informal learning. Senge, Roberts, Ross, Smith, & Kleiner (1995) also offer ideas for the promotion and development of learning in the workplace. They stated the key elements involve the commitment by a
group of learners within the workplace to learning, and the promotion of team learning.

Senge et al (1995) assert the essentials of workplace learning as being:

- Every individual needs to enhance their capacity;
- People are intelligent together;
- The development of new skills and competencies among individuals and teams; and
- The generation and sharing of knowledge within the workplace.

Wenger (1999) contends that learning involves four components “meaning (learning from experience), identity (learning by becoming), practice (learning by doing), and community (learning by belonging)” (p.5). The importance and the role of communities of practice on the learning process and the relationship to the social world (Wenger, 2010) will be discussed in later in this chapter.

Falk (2003) also explores the idea of interactions and relationships within groups with respect to skills development. He writes “learning occurs when interaction occurs” (p.2). Falk (2003) also suggests that interaction occurs when people engage with each other. This he says is how learning from this type of engagement can take place. In exploring the idea of how social interactions play a part in the learning process, Falk (2003) asserts that learning is the process of acquisition or reconfiguration of skills, knowledge and identity, which in turn assists the adoption of different roles or identities, resulting in a change in behaviour and/or a capacity to function using new knowledge, skills, values and attitudes within a social context.

Finally, Tak (2008) reports that professional development and learning in a social way can play a crucial role in the development of skills of the IT worker, which has direct implications for the digital content professional and this study. Tak (2008) identifies a number of informal learning activities that could include attending trade shows, conferences, books, manuals, professional journals, and magazines. Online resources, he suggested could
include online forums, vendor websites, user groups, online magazines, official technology websites and Internet search engines.

An area of learning that arises from the preceding discussion and is highlighted in part of the literature (for example Billett, 2002) is how learning occurs through everyday situated participation.

**Situated learning**

Situated learning is concerned with how learning occurs through everyday participation that takes place in the same context in which it is applied, and that learning is a matter of creating meaning from the activities of everyday experiences (Lave & Wenger, 1991; Rogoff, 1995). Brown, Collins, & Duguid (1989) suggest situated learning that takes place in realistic settings and contexts that provide meaning in the situation through access to everyday knowledge. It is also argued that situated learning is about the nature of dynamically constructed and acquired skills and knowledge that is learned through participation of everyday activities (Lave & Wenger, 1991; Rogoff, 1995).

In their work of Lave & Wenger (1991) discuss how learning occurs through everyday participation in social activities. Lave & Wenger's (1991) work is based on case-studies of how newcomers learn in various occupational groups which are not necessarily based on formal education and training. Their case for situated learning is supported by empirical studies of everyday learning in five different settings: midwives, tailors, navy quartermasters, meat cutters, and alcoholics. Lave & Wenger (1991) went on to suggest that participation in workplace participation is key to effective learning.

From Lave & Wenger's (1991) perspective everyday learning should be conceptualised not just as the acquisition of skills and knowledge, but also that the nature of the situation impacts significantly on the learning process. Similarly, Rogoff (1995) argues that situated learning is dependent upon participation on cultural activities with the explicit or
implicit guidance of more skilled individuals. Extending her view, Rogoff (1995) also identifies the link between skills and knowledge acquisition is based on the social context where learning occurs in a social situation in which an individual participates as part of everyday activities.

Other writers (see Billett, 2002; Wertsch, 1991) describe the notion of situated learning as a way of participation in workplace activities as a means of learning. In the According to Wertsch (1991) through participation in the workplace, individuals have the opportunity to talk about what they are doing during everyday activities. Billett (2002) argues that workplace activities are structured by historical, cultural and situational factors that influence the type and quality of learning and participation that occurs. Billett (2002) also suggests that situated workplace learning in terms of the acquisition of skill and knowledge is founded on participatory social practice through the engagement of in workplace activities that support and guide the learner as part of shared workplace endeavours.

In summary, situated learning is concerned with how learning occurs through everyday participation in social activities. It was suggested that situated learning is about the nature of dynamically constructed skills and knowledge within a social activity and context. Lave & Wenger (1991) emphasise that situated learning is a social process and affords the learner an opportunity to learn and acquire new skills and knowledge. Additionally, situated learning views learning as a workplace based practice based on factors that influence the process of informal learning.

A theme that emerges from this preceding discussion is one of what needs to be learned and that learners become aware of their need to develop their skills and knowledge through self-direction. These principles will be discussed in the next section.
Self-directed learning

Self-directed learning it is argued is a process of learning, which is centred on the learner’s need where the focus of learning is on the individual and self-development (Lindeman, 1926; Dewey, 1938). It is also described as a process in which the learner takes the initiative and responsibility for setting their own learning goals, identifying and addressing gaps in their learning, identifying resources, selecting and carrying out learning strategies and evaluating their own learning needs (Knowles, 1975; Merriam, 2001).

Lindeman (1926) argues that adults are motivated to learn, that their learning is life-centred, and that experience becomes the richest source of learning. Dewey (1938) describes the adult learner as a person with needs, interests, and is engaged in lifelong growth. The views of Lindeman (1926) and Dewey (1938) were reinforced through later work by Knowles (1970, 1975). In his work, Knowles (1970) reinforces the concept of self-directed learning and individual responsibility as important characteristics of adult learning theory, and argues that the learner should be responsible for their own learning and make their own learning decisions. In Knowles’s (1975) view self-directed learning is:

The process in which individuals take initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing learning strategies and evaluating learning outcomes. (p.18)

A different view is taken by Merriam (2001) who emphasises the importance of and how self-directed learning takes place. In her view the importance of self-directed learning is based on four key assumptions of the adult learner: (1) has an independent self-concept to direct their own learning, (2) has accumulated a reservoir of life experiences that is a rich source of learning, (3) has learning needs related to their social and workplace needs, and (4) is motivated to learn by internal rather external factors. Merriam (2001) also adds that self-
directed learning has as one of its goals the development of the learner’s skills and knowledge, and the promotion of learning as a social action.

From this discussion then, the development of skills can also be attributed to self-directed and informal learning. Adult learners are viewed as being able to take responsibility for their own actions and empowered to learn based on their experiences and learning needs. Motivations for self-directed learning can be varied, and allows individuals to develop skills and acquire new knowledge that have an impact on their workplace practice. As much as this type of learning can be considered self-directed, learners must be considered capable to identify what they need to learn, how they will learn, and how they will their goals. In doing so, learners engage in workplace and social interactions which impact on the learning process. In fact some writers in this area (for example Burak, 1993; Hancock, 1993) identify three factors in how learners can accomplish self-directed learning: (1) identify and define their learning needs, (2) develop action plans and timelines, and (3) identify, find, and critique information and resources to address the learning need.

In this context, learning from the experiences of others via some form of collective participation is what Lave & Wenger (1991) call a community of practice, and will be discussed later in this chapter. Much of the research in this area combines situated learning, self-directed learning, and collective participation, which together define the characteristics and ways of belonging to a community. The concepts of the social world and how informal learning can occur in social practice will be explored in the next section.

**Social networks**

The social network for professionals in the digital content industry is very important for their ongoing skill and professional development.

Granovetter (1985) provides a description of social networks where he suggests the concept of the social network is based on the individual and is not restricted to economic or
permanent relations. Additionally Skerlavaj, Dimovski, & Mrvar (2008) argue that the social network approach views workplaces as systems of people, groups, and businesses joined by a variety of relationships. Dawson (2008), in citing Haythornthwaite (2002), promotes this view and notes that a social network involves the exchange of resources between people and how these interactions build relationships within some sort of social system. Cross, Parker, Prusak, & Borgatti (2001) and Dawson (2008) argue that from these interactions social groups will emerge. More importantly the social network provides an approach to better understand the human interaction, relationships, and flows between people, groups, and businesses, or other information and knowledge processing between the various entities.

Social networks are important to learning in that engagement through social practice coupled with participation in a social group, learners develop common understandings and are socialised into the group (Wenger, 1999). The social network can also be used to measure what is termed social capital: the value that an individual adds and gets from the social network and its interactions (Cross et al, 2001; Falk, 1997; Fukuyama, 1999; Granovetter, 1985; Putnam, 2007). There are a number of mainstream theoretical understandings of social capital and its origins widely in use. This idea of social capital is based on the premise that rational actors invest in a specific social relationship in the same way as they do in a specific financial asset because they expect the greatest possible return, although not necessarily in the form of money, but in the form of intellectual exchange, knowledge creation, and learning. Woolcock (1998) describes social capital as "encompassing the norms and networks facilitating collective action for mutual benefit" (p.155). Cross et al (2001) argue for the value of collaboration and the role of relationships in this endeavour. They describe the qualities of a social network as “knowledge, access, engagement, and safety” (p.105). In focusing on how social networks and relationships support information sharing, Cross et al (2001) highlight four key themes: knowing what
another person knows, gain timely access to that person, willingness to support knowledge sharing, and safety in the relationship.

**Network analysis concepts**

The concepts of the social world and how informal workplace learning occurred was discussed earlier in the review of the literature. It is argued that the social network is based on the individual and is not restricted to economic or permanent relations, it views workplaces as systems of people, groups, and businesses joined by a variety of relationships, and can be viewed as an exchange of resources based on interactions and relationships within some sort of social system (see Dawson, 2008; Granovetter, 1985; Skerlavaj et al, 2008). So, based on these views, the social network provides an approach to better understand human interaction, relationships, and flows between people, groups, and businesses, as well as other factors such as information and knowledge processing between the various entities. This is of great significance for this study as two of the research questions were aimed at documenting and analysing the role and function of informal learning networks for the interviewees of this study.

Social network mapping and analysis are a rapidly growing research area for information system scholars (Kukkonen, Lyytinen & Yoo, 2010). A number of writers (for example Cross et al, 2001; Haythornthwaite, 1996; Wasserman & Faust, 1994) note social network analysis, or network analysis can provide a rigorous and systematic means to assess networks and their structure as organised or enabled by various information systems. They suggest it provides a way to map and analyse relationships generated among people, teams, departments, or even geographical regions or locations (Cross et al, 2001; Lazer et al, 2009). In employing these network mapping approaches they provide the structural characteristics of the network (such as the patterns and connections within the network) as well as individual attributes of the individuals, and a representation of social approaches contexts, and
relationships (Kukkanen et al, 2010). Social network analysis then focuses on patterns of relationships between people as well as examining the availability of resources and the exchange of resources between these people (Scott, 1991; Wasserman & Faust, 1994; Wellman & Berkowitz, 1988). The resources exchanged could include different elements such as information, social support, or even influence. The transactions therefore could occur between individuals as well as between organisations and/or institutions (Haythornthwaite, 1996).

Another field that was identified in the course of the literature review was that of ethnography mapping and connective ethnography. Connective ethnography is one methodology that is proposed to address the issue of integrating research across online and offline spaces (Hine, 2000, 2007; Leander & McKim, 2003). The idea of connectivity suggested the ethnographic field site is determined more by “tracing the flows of objects, texts, and bodies” (Leander & McKim, 2003, p.211) as well as analyse the construction of boundaries within and between virtual and physical spaces. Connectivity also suggests that online practices are increasingly embedded in offline practices and vice versa. Mann & Stewart (2000) write that connective ethnography tends to blend traditional with online research methods in which the data generated by each method add “layers of understanding” (Strathern, 2002, p.303) to the ethnography. Dirksen, Huizing, & Smit (2010) suggest connective ethnography is much better equipped to capture more accurately the dynamics of online practices or, more generally, all those work practices that are becoming more and more technology-intensive. In their concept of connective ethnography Dirksen et al (2010) discuss the physical context, as well as the connections between information resources in the form of such factors as people, systems and information exchange.

In a similar way Wittel (2000) draws on the work of Castells (1996) where he suggests the study of networks has moved toward what he terms “ethnography of networks”
Wittel (2000) notes that networks are still related to geographical space and networks do not merely consist of a set of people, but also of a set of connections between the people (or nodes). In his view ethnography of networks consists of the examination of the nodes, connections and flows (such as ideas and information) between these nodes. In attempting to describe and illustrate how informal learning networks operate for the interviewees in this study, it drew upon documenting such factors as the flow of information, the connections an individual has within their network, the type of information that is exchanged, and what role if any, social relationships have in their networks. The process and considerations for illustrating and documenting the learning networks of the interviewees will be described later in this chapter.

Of particular relevance to this present study Dirksen et al (2010) shows how technology has impacted on areas such as professional identity, connections with other professionals, the sharing of knowledge within the network, the role of social relationships, and more importantly the emergence of the virtual-online community. The concepts and ideas offered by these various studies and writers (for example Borgatti & Foster 2003; Dirksen et al, 2010; Hoang & Antoncic, 2003; Kukkonen et al, 2010; Parkhe et al, 2006) are of particular relevance to this present study.

Several conclusions can be drawn from the notion of learning networks and the close alignment to social networks. Firstly, that learning networks promote knowledge transfer between individuals in their professional field, and in socially-based relationships (see Eraut, 2000; Nonaka & Takeuchi, 1995; Poell, Chivers, Van der Krogt & Wildermeersch, 2000; Skerlavaj et al, 2008; Tak, 2008; Van der Krogt, 1998); and secondly learning networks exhibit a number of similar traits to social networks: the role of the individual is key in a network, the role of social and business relationships of the individual, knowledge and
information sharing occurs between the individuals, and situated learning that is work and profession or industry focused.

An important concept that can be drawn from preceding discussion is the relevance and importance of an individual’s relationships and ties, and how they relate to social network concepts. This will be discussed in the following section.

Relationships and ties

The notion of tie-strength was found to be an important concept in documenting and understanding social networks. It is worth noting that ties are described as relationships that indicate a connection between two or more people or things (in pairs) and as such are tied by the relationships they maintain (Haythornthwaite, 1996).

The strength of a tie is a quantifiable property that characterises the link between two nodes (Haythornthwaite, 1996; Petroczi, Nepusz & Bazso, 2007). By definition tie strength is a “combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and reciprocal services which characterize the tie” (Granovetter, 1973, p.1361). Granovetter (1970) identifies three key indicators of tie-strength: closeness, duration and frequency, and breadth of topics. He challenges the notion that only strong ties are important in information exchange, and coins the phrase “the strength of weak ties” (p.1360) and confirms the importance of both strong and weak ties in the exchange of information. He argues that “those to whom we are weakly tied are more likely to move in circles different from our own and will thus have access to information different from that which we receive” (p.1371). Later studies in this area reaffirm the value of ties in the exchange of information (for example Granovetter, 1982; Lin & Bian, 1991), which confirm the importance of both strong and weak ties in information exchange. However, writers such as Granovetter (1973) and Haythornthwaite (1996) suggest that it is not just the strength or weakness of a tie that contributes to the function of these ties in information exchange, they also describe the nature
of an individual’s connectedness within one or more networks and people within these networks which affects their exposure to specific kinds of information.

Haythornthwaite (1996) suggests that relationships can be used to share, deliver or used in the exchange of a wide variety of resources, as such, information can be classified as content driven. She asserts that for the content to be exchanged, the interactions between pairs need to be examined, and this includes a large number of relationships, including social relationships. In summary, then, relationships describe a specific kind of interaction between individuals, groups and organisations. It can be directed with information or other resources flowing from one person to another, and they can also be unidirectional, where both parties exchange the same kind of information. It also identifies that relationships between people form the ties between the individuals within a network. Granovetter (1973) and Haythornthwaite (1996) both note that the more relationships an individual maintains, the more long-lasting and more personal the relationship, the stronger the tie. Strong ties, they suggest, show a willingness to share information, while weak ties can demonstrate, and provide, access to more and different information due to their connections in different networks.

Given the nature of the industry and the work environment of the industry professionals in this study, the relevance of personal online networks will now be discussed.

**Online networks**

The idea that professionals engage and manage online connections as part of their individual development has been discussed by a number of writers. One set of writers argue that successful groups engage in a variety of tasks, both work oriented and socially oriented, that help members work together to achieve their goals, (for example Gabarro, 1990; Haythornthwaite & Wellman, 1998). While others suggest that viable online learning communities are increasingly being used in education programs to share ideas, resources and
knowledge (for example Dabbagh & Kitsantas, 2012; Rajagopal, Brinke, Van Bruggen, & Sloep, 2012). Some writers (such as Bond, 2004; Gabarro, 1990; Kaye, 1995; Putnam & Borko, 2000) suggest that online learning communities build trust and encourage information sharing, and that creating online personal relationships can make it easier for individuals to learn and interact online. More recently, given the emergence of powerful online technologies, learners and professionals alike have recognised the critical importance of various social and online media technologies as part of their ongoing learning and development (Dunlap & Lowenthal, 2011a). In their view, Dunlap & Lowenthal (2011a) argue that blogs and social networking sites, such as Twitter and Facebook, provide learners with significant educational opportunities given the frequently changing professional needs, demands and information technologies in the workplace. Finally, Bruffee (1993) and Koschmann (1996) add that personal relationships are particularly important for learning communities, where a safe environment is necessary to encourage questions and the exchange of ideas, as they promote dynamic and interactive communication, which is associated with increased satisfaction, learning, and sociability.

In terms of promoting and encouraging learning, online communities and technologies support interactive collaborative learning, peer-to-peer sharing of experiences; increases exposure to ideas and techniques; and enhances individual learning (Dabbagh & Kitsantas, 2012; Dabbagh & Reo, 2011b; Granovetter, 1973; Harasim, Hiltz, Teles, & Turoff, 1995). It is referred to as an online-mediated community that facilitates and encourages interaction and communication through technology (Stuckey, 2004).

Drawing on the literature and ideas offered by social networks, it could be also argued that there is a link between the role of online networks and the ties between relationships within the network. As was discussed earlier, weak ties can provide access to new information because of contact with different individuals gives them access to different
information sets (Burt, 1992; Granovetter, 1973). These ties also have relevance when it comes to learning, as they can bring in different viewpoints and approaches to learning and other techniques (Koschmann, 1996; Rogers, 1995). It can also be seen from Granovetter’s (1973) work that weak ties tend to be more instrumental than strong ties in terms of access to different types information and resources.

Some approaches discussed by writers in the field (for example Constant, Sproull, & Kiesler, 1996; Dutton, 2008; Haythornthwaite & Wellman, 1998; Petroczi et al, 2007) support and promote weak online ties, which include such things as email lists, online groups, online social networks and videoconferencing facilities. On the other hand, Haythornthwaite (2000) suggests that supporting and developing strong ties is more difficult given that online interactions and relationships are not face-to-face. It is also argued that given enough time these online interactions could develop in such a way that the individuals develop even closer relationships through the increased use of various forms of online technologies (Haythornthwaite & Wellman, 1998; Walther, 1995).

Of further relevance to this study is the idea of widely-distributed online networks. Dutton (2008) describes the notion of collaborative network organisations as being digital and online networks that are widely used to share expertise, knowledge and peer-to-peer sharing using widely-distributed online technologies. In describing the value and application of collaborative network organisations, he suggests that a number of positives can be taken from these types of networks as they can aggregate geographically distributed information and intelligence as well as bringing together different viewpoints and perspectives. In a similar way, Petroczi et al (2007) describe what they call “computer-mediated social networks” (p.39). They also point to the growth of various online technologies and multimedia, such as email lists, newsgroups, focus groups, forums, online chat services and multi-user role-playing environments. Of particular importance to this present study are
several writers (see Conway & Steward, 1998; Kruskal & Seery, 1980; Petroczi et al, 2007; Scott, 1991) who suggest that researchers are able to map the formation and dynamics of an individual’s network from various data sets.

**Graphic representation of networks**

The process and the discussion for the systematic method for revealing and mapping-out networks is argued by several writers (for example Bertin, 1983; Conway & Steward, 1998). It is suggested that the network graphic provides a powerful and underutilised tool for the representation of relational data (Conway & Steward, 1998).

The origin of the graphic representation of social networks in sociological research can be traced back to the sociogram of Moreno (1934), which was designed to represent the informal relationships between individuals. The classic Hawthorne studies in business organisation research used sociograms to reveal the pattern of informal organisational relationships of managers and workers in the factory setting (Roethlisberger & Dickson, 1939).

Conway & Steward (1998) suggest that the value of the network graphic lies in its ability to encode a variety of quantitative and qualitative data by employing a range of visual variables such as size, value, texture, colour, orientation and shape. However, they also note that there is considerable diversity in the type of nodal and linkage data that can be portrayed, the forms of representation that can be adopted, and the clarity, precision and efficiency of the visual diagram. For other network researchers (such as Bertin, 1983; Kruskal & Seery, 1980; Scott, 1991), the creation and usage of network graphics and diagrams is an illustrative device rather than an analytical tool. Given these issues surrounding the depiction of network diagrams, several writers suggest the need for a set of conventions to take account of factors such as developing a good set graphics and the representation of ties between people or nodes within the network (Kruskal & Seery, 1980; Tufte, 1983). Finally, Conway & Steward (1998)
note that a growing number of software tools have been developed for constructing network diagrams and conducting network analysis. These may be broadly classified into two categories: graphic depictors, which use visually-orientated software packages; and structure analysers, which are largely structurally-orientated packages.

The idea that networks are able to be illustrated by showing connections between people, other professionals and even online communities has a particular relevance to this study in terms of addressing two research questions that focus on identifying the role and function of informal learning networks as part an individual’s ongoing skill and professional development.

By way of addressing the two research questions, the network diagrams and the depiction of the individual’s learning network play a critical role in the illustration and interpretation of personal networks. To assist in the process of being able to map the respective networks, two network diagram templates and a series of visual variables have been developed. These variables include business and social interactions, the diversity of interactions, links and flows within the network, the strength of ties between individuals, and the type of information and learning that occur between individuals. This will be further described in the interview analysis section of Chapter three.

**Social learning approaches**

The literature reviewed in this section will provide grounding in two social learning approaches that professionals in the digital content industry can utilise for their skill and professional development: communities of practice and learning networks.

In a broad sense, communities of practice describe the interactions within a workplace setting, while learning networks portray broader social interactions not necessarily contained within a workplace setting. A discussion of how communities of practice and learning networks are important to skill and professional development will now be provided. Foley
(1999) argues that social action and interaction can facilitate learning. He describes how co-workers discussing work over dinner felt comfortable reflecting on work practices and experiences. He asserts that by reflecting on work in this way, these co-workers engaged in a type of social learning similar to what Lave & Wenger (1991) would argue is a community of practice.

**Communities of Practice**

Communities of practice locate learning in a relationship between the person and their social relationships, and this can be viewed as a social learning system (Lave & Wenger, 1991; Wenger, 2010). In his later work, Wenger (2010) suggests that arising from this socially-mediated approach, the community of practice exhibits characteristics such as emergent structures, complex relationships and self-organisation.

Lave & Wenger (1991) have had a large and significant impact upon the understanding of interactions that occur as communal activity and in the notion that learning can be a social activity that fosters interactions and encourages a willingness to share ideas. They define the term ‘communities of practice’ to describe learning through practice and participation, which they also call “situated learning” (p.3). Lave & Wenger (1991) argue the nature of the situation impacts significantly on the process of learning. They also stress the idea that situated learning, which defines the individual’s learning as a social practice and allows for the development of opportunities to influence how learning may take place. This view is supported by Wenger (2010), who suggests that the community of practice locates learning in a relationship between the person and their social relationships as a network. This will be discussed later in this section.

In focusing on the social aspects of the community of practice, they argue that relationships between individuals can provide the context for the shared practice. In their earlier work, Lave & Wenger (1991) also suggest that communities of practice are more than
just groups of individuals learning from and with each other; they are groups of individuals where learning occurs between the group members. In clarifying their idea of the community of practice as a social process Lave & Wenger (1991) write:

> Activities, tasks, function, and understandings do not exist in isolation; they are part of relations in which they have meaning. These systems of relations arise out of and are reproduced and developed within social communities, which are in part systems of relations among persons ... learning thus implies becoming a different person with respect to the possibilities enabled by these systems of relations. To ignore this aspect of learning is to overlook the fact that learning involves the construction of identities.

(p.53)

Lave & Wenger’s (1991) statement would seem to confirm the view that learning is a social process and can be influenced by relationships that individuals engage in. Lave & Wenger (1991) clearly identify learning as a social process and acknowledge the contribution that external resources and relationships can make to support and facilitate the learning process. Thus, they argue, individuals develop and engage with their social relationships and this affects their participation in different communities. In sum, based on the views of Lave & Wenger (1995) and Wenger (2010), communities of practice are people who share a collection of ideas, an activity or a profession by being a participating member of a community in the creation of knowledge.

Based on the preceding discussion a community of practice can be viewed as a social learning system (Wenger, 2010). Arising out of learning, he argues, it exhibits many characteristics of systems more generally: emergent structure, complex relationships, self-organisation, dynamic boundaries, ongoing negotiation of identity and cultural meaning, to mention a few. Wenger (2010) also suggests it is the simplest social unit that has the characteristics of a social learning system.
In discussing the role of a community of practice as a social network, Wenger (2010) suggests that a group is a network and a community, and, as such, they coexist as structured processes. Wenger (2010) argues that network and community processes have complementary strengths and are two avenues for enhancing the learning capability of a group, and as they can be random and unpredictable they allow for group dynamics and the ability to commit to a learning partnership. Wenger (2010) also states that the network and community alike can be inspiring to the learner in order to discover others who share the need to learn.

To highlight the value and impact that communities of practice have had on the workplace, Wenger (2010) provides a number of examples and applications of communities of practice: (1) in private and public sectors, communities of practice have provided a vehicle for peer-to-peer learning among practitioners; (2) communities of practice are increasingly used for professional development that offers a fresh perspective on learning and education; (3) the rise of new technology and social media has triggered much interest in online communities of practice. Ultimately, Wenger (2010) concludes that given the prominence of online technologies and social media, the learning process of the community of practice is particularly suited to the peer-to-peer learning process and influences new thinking about the role of educational institutions and the design of learning opportunities. This is an important point, and will be discussed later in the conclusions and recommendations.

Wenger (2010) also describes the community of practice as a learning partnership. He suggests that learning capability is anchored in a mutual recognition of potential learning partners, and summarises the function of a community of practice as a learning partnership in three ways: (1) the discipline of community in determining who to interact with and how to manage those interactions; (2) the discipline of practice and its links to practice, learning and its benefits; (3) the discipline of convening in terms of the social learning space, leadership of
the group and support processes to maintain the group. From this, then, what can be seen is the understanding that learning and the creation and sharing of knowledge can be viewed through a set of relationships within a social collective, in either a formal or an informal setting. In sum, communities of practice are people who share ideas or a profession by participating in a community aimed at the creation and sharing of knowledge that has relevance to practice in a workplace context.

Cross et al (2001) support this view with their contention that by the sharing of information and ideas, building knowledge and relationships, social networks were critical for obtaining and learning how an individual does their work. This is seen in the work of Ehrich & Billett (2006) who conducted a study of how small business operators in Queensland learned about and implemented the goods and services tax (GST). In their study, they identified seven approaches that described how it contributed to the learning: by doing, advice from consultants and tax specialists, attending formal courses, through industry associations, access to local networks, government support, and advice of other small business operators. Of the key approaches identified by the small business operators, engagement with networks was deemed “indispensable” (p.18). The networks were seen as being useful in so far as providing a basis for sharing information, testing ideas, and, in some cases, sharing resources. Ehrich & Billett (2006) note that social interactions and networks “proved a very useful situation for sharing information and ideas” (p.18), thereby reflecting a particular kind of network. The approach taken by these small business operators would seem to support Lave & Wenger’s (1991) contention that by reflecting and interacting in this way individuals are engaged in a socially-mediated learning activity.

Building on the role of the community in the workplace, learners are acquiring not only explicit formal expert knowledge, but the embodied ability to behave as community members. For example, learners learn to tell and appreciate community-appropriate stories,
and in doing so, provide a narrative-based set of resources (Brown & Duguid, 1991). They suggest that learning is fostered by encouraging access to, and membership of, the community of practice through actual practice and actual community engagement in which the learning will occur. Lave & Wenger (1991) argue this point where they note that learning, understanding and interpretation involve a great deal that is not explicit, and is developed and framed in such a way that it can be situational; work-based, and directly related to the individual’s profession; involve participation with others in a group as a learning activity; and self-organised. Similarly, learning networks focus on the learning activity through business and social relationships as a mechanism for ongoing development. So, for individuals working in micro businesses in the digital content industry and working with the rapid pace of technological advances, informal learning would seem the most effective approach to facilitating the learning process. The significance, then, of the learning theory surrounding communities of practice, lies as much in its implications for practice as for its function as a social learning approach, group interaction and the exchange of information.

Lave & Wenger (1991) add that communities of practice, which they also call a learning network, are enacted through peer-to-peer collaborative activities where members of communities of practice come together willingly across different divides to share information, build knowledge, develop expertise and solve problems. They do this not only through workplace and business relationships, but also through their broader social relationships, to update and refresh their industry and professional skills.

**Learning networks**

Learning networks demonstrate how learning is produced and reproduced by interactions among various individuals that are organised and related to the learning process. It is also argued that learning networks can operate in three modes: internal to the business, externally with links to a profession, and in socially-based relationships. Cross et al (2001)
argue that a significant component of a person’s information environment consists of the relationships they can tap into for various informational needs.

The idea and theory of the learning network is based on the premise that learning networks are not limited to network-type organisations, matrix organisations or team-based organisations, but, rather, the idea that people learn in every organisation, even in a hierarchical or non-hierarchical one, where the learning network represents how learning is organised (Van der Krogt, 1998). As Poell, Chivers, Van der Krogt, & Wildermeersch (2000) argue, “the learning network is a descriptive theory ... to understand and develop alternative ways of organising employee learning in relation to work” (p.25). Learning network theory also demonstrates how learning networks are produced and reproduced by interactions among various individuals that are organised and related to the learning process (Poell et al, 2000). Brookfield (1986), a renowned education researcher, asserts that successful independent learners use learning networks in which knowledge is seen as a resource, is transmitted through oral encounters, and develops expertise. Van der Krogt (1998) describes the learning network as “a frame of reference for analysing the tensions between humanity and work relevance and provides leads for handling such tensions” (p.157). Finally, Ayas (1997) and Nonaka & Takeuchi (1995) note that networks are important to learning for businesses involved in innovation activities. Ayas (1997) and Nonaka & Takeuchi (1995) argue that the workplace can be a powerful source for learning, where managers cannot afford not to encourage learning in one or way or another through creating and sharing new knowledge, which is crucial in the innovation process. Bridgstock, Dawson, & Hearn (2011) add to this point and argue that social relationships are important to the innovation process. In a study of 16 innovators, they found new ideas are shared and created via networks, and argue that “innovation is best viewed as a social process” (p.106), and individuals operate within networks that include people, technology, knowledge and ideas. Bridgstock et al (2011)
conclude that there is an implication for education. They argue that the behaviour of the individuals within such networks provides an avenue to innovate.

In focusing on how learning takes place and the learning opportunities afforded by the learning network, Bessant & Tsekouras (2001) describe it as “a network formally set up for the primary purpose of increasing knowledge” (p.88). More recently Skerlavaj et al (2008), in a study investigating how learning occurs within a consulting business, highlight the role of the individual, and describe the learning network as a way learning is organised within the context of a work organisation, and linked the idea of learning through a social network and community of practice as a holistic learning approach. A conclusion that can be made on the impact of how learning networks aid the business is summed up by Poell et al (2000), who claim “that learning becomes more and more important for the survival of present day organisations” (p.26). Knowledge, then, has come to be regarded as a key asset for employees, as is their ability to readily acquire it and use as a core competence.

In the broader field of workplace related learning and learning networks, a number of writers (such as Dale & Bell, 1999; Billett, 2001, 2002, 2007; Eraut, 2000; Nonaka & Takeuchi, 1995; Poell et al, 2000; Skerlavaj et al, 2008; Tak, 2008; Van der Krogt, 1998) state that learning occurs in three broad areas: internal to the business, with work colleagues in project and/or work teams; externally, where employees have a strong orientation to their professional field; and in more socially related relationships.

Skerlavaj et al (2008) suggest that in order for learning and development to occur, the individual must have the opportunity to learn. In entrepreneurial organisations and in organisations based on group work, individuals are the core members of the network; they make independent decisions on the content of their work and within the group context (Van der Krogt, 1998). A more direct implication for workers in the digital content industry, in the context of how they may learn, can be attributed to Tak (2008). In a study of how information
technology (IT) workers best develop and inform their learning approaches, he found learning through interaction and collaboration in a learning network type of environment afforded the best approach to workplace learning. Tak (2008) suggests that by having access to work colleagues, friends and personal networks, the individual gained a valuable insight and knowledge relevant to their work practices. Focusing on the interactions and the workplace learning process, Falk (1997) writes that groups of individuals learn from, and with, each other, and that learning occurs between group members. He also adds that in workplaces, people interact and engage with each other in contexts related to their work. Much in the same vein, Brown & Duguid (1991) also describe how learners need access to the communication process that occurs within the learning environment. Brown & Duguid (1991) view learning as a social construction by putting knowledge back into the work context in which it has meaning. From this perspective, they argue that the learners can in one way or another be seen to construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the people involved.

At this point it is important to summarise and link a number of traits between social networks, communities of practice and learning networks, as they relate to informal learning. Social networks are systems of people, groups and businesses that are joined by a variety of relationships, and provide an approach to better understand the interactions and flows of information and knowledge between these different groups within a social network. The learning network describes how the learning activity takes place through the interactions of individuals through a network specifically formed for the primary purpose of increasing knowledge that directly relates various learning activities. Finally, the community of practice is a socially-mediated approach to discussions and interactions with like-minded individuals that are linked to the individual’s profession. It involves participation with others in a socially
constructed group approach, where people share a collection of ideas, an activity or a profession by being a participating member of a community in the creation of knowledge. Clearly, then, all three social approaches play a role in a person’s informal learning pathway, as they involve access to business and social contacts, face-to-face discussions with other industry and sector professionals, and offer a description of how the learning activity is enacted.

Of particular significance to this study, individuals working in micro businesses in the digital content industry do not have the support of a human resources or learning and development sections to assist in the planning of their learning pathways. Typically, then, they must engage and learn informally through their social and business relationships in order to maintain their skill currency and to further their professional development.

**Informal learning and learning networks for professional development**

It makes sense for professionals in the digital content industry to utilise the learning affordances of socially-mediated networks, in that both communities of practice and learning networks are an optimal way to develop their specialist skill sets.

Moreover, the ongoing development of an individual’s professional skills, either technical or non-technical, is also discussed by Billett (2004). He writes that considerations of the individual’s engagement in workplace activities, and access to it, may inform a broader view of their learning experiences and their enhancement. He also links professional development to the central foundation of workplace learning opportunities or guided learning for work, with respect to the consideration of the development of the individual’s vocational skills. Van der Krogt (1998), in writing about how learning networks provide an opportunity for development, emphasises that all people are different, that they have their own individual learning experience and views on what they want to learn and how they want to learn it, that they differ in their capacity to learn, and that they are responsible for their own development.
Professional development and learning through the access and involvement in a learning network plays a crucial role in the development of the skills of the IT worker (Tak, 2008). This has several possible implications for the digital content worker. Tak (2008) identifies a number of learning activities, which could include attending trade shows, books, manuals, and various online resources and search engines. Taking up this point on the approaches to an individual’s development, Poell et al (2000) suggest activities would include “job coaching, solving difficult work problems, taking on-line courses, external training, and asking experienced colleagues for help” (p.34). Another view is offered by Bridgstock (2009), who writes about employability through career management skills. She suggests that “career management can be viewed as the ability to build a career; to intentionally manage the interaction of work, learning, and other aspects of the individual’s life” (p.35). In her view, there are two key elements that lead to the development of specific discipline and generic skills: self-management and career building skills. According to Bridgstock’s (2009) model, the key approaches to self-management and career building skills involves knowledge development, skills identification, locating learning opportunities and building professional relationships.

In a study of teaching and learning for entrepreneurs working in creative industries, Raffo et al (2000) found that the formal education path is not helpful to these individuals. In particular, they note “courses provided little in the way of technical and specialist business skills” (p.358). In fact some of the respondents in the Raffo et al (2000) study state that it was through informal business and social relationships that they developed their business and technical skills. Raffo et al (2000) also report that informal learning provided for the development of "marketable arts based skills and techniques" (p.359). Their study highlights the role of situated learning in the running of a business, the role of networking in business learning and getting information through social and business relationships. From their study,
Raffo et al (2000) conclude that pathways can be developed for professionals through a community, social and business relationships can play a vital role in the exchange of ideas through informally-situated professional settings, and, through social and business relationships, individuals can develop knowledge and understanding of working in the creative industries. These findings are consistent with other studies about how workers learn the knowledge required for their work and ongoing development (such as Billett, 1999; Ehrich & Billett, 2006; Guthrie & Barnett, 1996; Misko, 1996).

McWilliam & Haukka (2008), on the other hand, identify the importance of online resources as a tool for learning. They expand on the application of information technology as a tool for learning and write “information and communication technologies have a very important role to play in enabling the development of personal learning networks” (p.656).

McWilliam & Haukka (2008) point to the value of information technologies in citing Siemens (2005) and write:

Blogs, wikis and other open, collaborative platforms are reshaping learning as a two-way process. Instead of presenting content/information/knowledge in a linear sequential manner, learners can be provided with a rich array of tools and information sources to use in creating their own learning pathways. The instructor or institution can still ensure that their critical learning needs are achieved by focusing instead on the creation of the knowledge ecology. The links and connections are formed by the learners themselves. (p. 656)

The importance of online technologies in the learning function has become an important resource in the informal learning process. Like Siemens (2005), other writers also report on the value and impact of networked and online technologies in terms of their role in communication, collaboration and interaction in promoting and generating learning opportunities for learners (see Dabbagh & Kitsantas, 2012; Dabbagh & Reo, 2011b; Dunlap
& Lowenthal, 2011a; Robertson, 2011). For instance, according to Dabbagh & Kitsantas (2012), learning through the use of online technologies has become a highly self-motivated, autonomous and self-managed informal learning system, while allowing for participants to share their learning achievements and manage “their own meaning making” (p.3). Another set of writers (see Anderson, 2008; Siemens, 2005) argue that the development and advancement of networked and online technologies are inducing and transforming educational approaches, where the learner accesses an online community to support their personal learner-centred learning. A number of writers (see Dabbagh & Kitsantas, 2012; Dunlap & Lowenthal, 2011a; Robertson, 2011) argue that various online and social media technologies, such as blogs, Facebook, Twitter, Flickr and LinkedIn, provide and enable networking, as they facilitate and foster informal learning while also allowing learners to gather and share information and knowledge relevant to their own learning. Martindale & Dowdy (2010) conclude that these online tools enable learners to create, organise and share content to support their own personal learning needs.

In describing how learning networks can foster professional development, Van der Krogt (1998) describes four models: entrepreneurial individual work, task oriented work, horizontal problem and project-based learning, and innovative profession oriented learning. It is argued that of the four models developed by Van der Krogt (1998) there are three that would best describe how individuals in the digital content industry attend to their learning needs: entrepreneurial individual work, horizontal problem and project-based learning, and innovative profession-oriented learning. In the entrepreneurial individual work, the individual makes independent decisions on their work flow and practices, and their engagement with outside business relationships. In horizontal organic learning networks, people form groups to develop and execute learning programs. Steering of the learning process and coordination between the different components of the program takes place in consultation within the
group, thus learners can have a direct influence in the group and the learning process. This kind of learning network is likely to consist mainly of learners who wish to function and learn in a collective (Van der Krogt, 1998). In the innovative learning network, new insights and methods are developed in the professional field and transferred to the professionals working within the business, or between learners in a professional field. The network extends beyond the workplace boundaries and includes other industry professionals, such as in initiatives and programs for refresher and postgraduate courses. Such external learning networks can be expected to come about at the initiative of the learner who has a preference for collegial innovative learning (Van der Krogt, 1998).

Much in the same way, Bessant & Tsekouras (2001) identify what they call “a typology of learning networks” (p.89). They identify seven types of learning networks specifically organised for particular learning purposes: professional, sector-based, topic-based, region-based, supplier based, government-promoted, and task-support network. It can be argued that of the seven types of learning networks identified by Bessant & Tsekouras (2001), there are four that would best describe how individuals in the digital content industry could attend to their learning needs: professionally-based, sector-based, topic-based, and regionally-based. The focus of the professional learning network according to Bessant & Tsekouras (2001) is for “increased professional knowledge and skill for better practice” (p.90). The sector-based learning network has some relevance to the worker in the digital content industry. This learning network type is typically “an association of firms with common interests in a sector” (Bessant & Tsekouras, 2001, p.90), and is primarily aimed at improved competence and technical skill development. The topic-based network is one that improves awareness and knowledge in a particular field, which Bessant & Tsekouras (2001) called “best practice clubs” (p.90). Finally, a region-based network is where individuals who are locally situated meet and discuss “themes of regional interest in clusters and local
learning cooperatives” (Bessant & Tsekouras, 2001, p.90). They can improve their knowledge and share experiences through such a grouping.

Poell et al (2000) also recognise the development of an individual’s competencies. They write: “employees ... would profit more from developing a broad set of professional qualifications enabling them to perform work in a variety of companies. Employees who are well embedded in their professional discipline have more possibilities to stay employed in interesting jobs” (p.31). It can be noted that through the work of writers such as Bessant & Tsekouras (2001), Ehrich & Billett (2006), Poell et al (2000), Raffo et al (2000), Skerlavaj et al (2008) and Van der Krogt (1998) the primary feature of the learning network is that of shared learning, “to enable capacity development” (Bessant & Tsekouras, 2001, p.90). This may include the development of technical skills and general business acumen skills through a formal course (as noted by AIMIA, 2005), or it could be that through informal learning networks they identify other pathways for movement within the broader digital content industry.

To highlight the uniqueness and focus of this study, Table 12 below provides a comparison of other relevant studies in terms of research topic, sample demographic, research methods and the number of participants.
<table>
<thead>
<tr>
<th>Author/s</th>
<th>Research topic</th>
<th>Sample demographic</th>
<th>Research method/s</th>
<th>Number of participants</th>
</tr>
</thead>
</table>
| Australian Interactive Media Industry Association (AIMIA, 2005) | To better understand the nature and contribution of the industry, and study the nature of technology diffusion | • Visual effects and animation  
• Interactive multimedia and software development  
• Computer and online games  
• Film & TV production | • Phone survey  
• Face-to-face interviews  
• Focus groups | 720 |
| Campana (2013)                               | Skill and professional development requirements of micro business digital content professionals | • Apps and software development  
• Graphic design  
• Online marketing and publishing  
• Online games  
• Visual effects and animation  
• Film and TV production  
• Web development | • Online survey  
• Face-to-face interviews | 238 |
| Haukka (2011)                                | Skill needs and gaps in Australia’s digital games sector                         | Games sector professionals                                                              | • Online survey  
• Blog questions | 2056 |
| Koh, Lee, Yen & Havelka (2004)               | Skill requirements of information technology (IT) professionals                | IT e-commerce professionals from small to large businesses                             | Mail survey                                                                 | 85 |
| Raffo, Lovatt, Banks & O’Connor (2000)       | Teaching and learning strategies in higher education                           | Micro and small business creative industry entrepreneurs                               | Face-to-face interviews | 50 |
| Skerlavaj, Dimovski, & Mrvar (2008)          | Learning networks as a learning environment for knowledge transfer             | Software development and business consulting professionals                             | Email questionnaire | 81 |
| Tak (2008)                                   | Workplace learning experiences of IT workers                                   | IT professionals from software development, technical support, and application and database businesses | Face-to-face interviews | 65 |
Research questions

The literature discussed and reviewed the areas of the digital content industry, social networks, informal learning and learning networks. However, in terms of researching these ideas and concepts, it was highlighted that there is a lack of research in Australia about micro businesses operating in the digital content environment, and in particular how professionals within the industry advance and maintain their skill and professional currency. Of particular interest is how informal learning networks can contribute to their ongoing skill and professional development. This has highlighted four research questions that have emerged from the literature review and are the focus of this study:

1. What are the key skills and professional development learning needs of digital content workers working in micro businesses?
2. What approaches do they undertake in their skill and professional development?
3. What is the role of the informal learning network in the digital content worker’s skill and professional development?
4. How do these informal learning networks operate?

Summary

This chapter has outlined the literature related to the creative economy, the creative industries and the digital content industry. It has developed the concept of how work is primarily conducted in the digital content industry in relation to the micro business and project-based operations. Individuals working in the digital content industry are at the technological, innovative and creative forefront, and therefore face constant change in which they must continually refresh and update their skills in order to maintain currency in their profession.

Central to the discussion of skill development for digital content professionals is the understanding and identification of generic and meta-cognitive skills. Several empirical and
theoretical works were identified as a way to address the issue of the skills gap and the skills needed by workers in a business environment. It was argued that workers and learners need to move from the traditional manifest, or job-related skills, and focus more on developing 21st century capabilities for workers operating in the 21st century information society.

The literature also identified and demonstrated approaches to how adult learners may access learning in both a formal and informal sense. In discussing the concepts of formal and informal learning it was highlighted that formal education and training is a valid pathway of development for workers in the digital content industry. The literature highlighted the fact that the learner can also employ informal approaches to learning. In this sense, three key approaches emerged: the social network, communities of practice, and the learning network. The ensuing discussion argued that to better understand the role of social networks, network maps or sociograms could be developed to provide a visual representation of a person’s network and depict factors such as information, flow of information and strength of ties. It was also established that the three approaches had similar traits: the role of the individual was vital in a network or a community, the social and business relationships of the individual, knowledge and information sharing occurred between the individuals, and situated learning that was work and profession or industry focused.

It was argued that individuals working in micro businesses in the digital content industry typically learn informally which seems to be achieved through their social and business relationships. Unlike larger businesses, micro businesses do not have the luxury of a human resources or learning and development section that can arrange and plan their formal learning. Informal learning is not a new area of study; however little information exists on how individuals in micro businesses in the digital content industry promote the skills and professional development.
The next chapter considers the research methodology, its purpose, and how it was designed and it’s relation to the research questions of this study.
Chapter 3
Methodology

Introduction
This chapter provides a discussion of the research methodology, including how the research was designed and how the online survey phase and interview phases were implemented. The chapter commences by outlining and describing the research questions and their alignment with the research methods, and introduces and describes the mixed methods research approach that was applied through two methods of data collection: an online survey and semi-structured interviews. The chapter continues by outlining the two phase approach utilising the two data collection methods, and the relevance and application of triangulation in the research design. The sections describe various facets of the research design for each phase, such as sampling, recruitment and data analysis. The final sections of this chapter highlight the research ethics requirements.

This chapter commences by outlining the research design, focusing on mixed methods research and its relevance to the research questions.

Research Design

Mixed methods

A mixed method approach was adopted in this research study to allow the researcher the ability to gather data in relation to the relatively unexplored area of informal learning in micro businesses within the digital content industry. Utilising a mixed method approach made the most of the strengths of both the qualitative and quantitative approaches to research. Mixed methods studies allow for the inclusion of both qualitative and quantitative methods of data collection and/or analysis to achieve a range of outcomes that draw on the strengths of both the quantitative and qualitative research (Creswell, 2005, 2009). Generally speaking, the
strengths of a mixed method approach allow the researcher to develop a broad understanding of the research problem through the use of a quantitative approach that allows the researcher to generalise results. Mixed method also incorporates a qualitative approach, which provides useful individual case information and describes phenomena related to a context or setting in rich detail, and it can build on the results from the other approach (Creswell, 2009; Johnson & Onwueguzie, 2004).

Creswell (2005, 2009) provides a framework that explains and recognises the different approaches taken within the mixed methods framework. Creswell (2009) discusses six strategies for researchers to choose from in designing a mixed method research study: sequential explanatory strategy, sequential exploratory strategy, sequential transformative strategy, concurrent triangulation strategy, concurrent embedded strategy, and the concurrent transformative strategy. For the purposes of this research study, a sequential explanatory strategy was implemented, where a qualitative data collection phase followed a quantitative data collection phase, as it utilised words and narrative to add meaning to the statistics. This type of approach can answer a broader more complete set of research questions, and can provide strong evidence through corroboration of findings (Creswell, 2009; Johnson & Onwueguzie, 2004). In this study, the online survey was aimed at identifying the skills needed and the learning approaches used within the industry, and then the data gathered from the interviews was used to provide greater clarification, depth and further empirical evidence on the skill requirements and approaches to skill development of industry professionals, as well as describe and document the role of informal learning networks.

Integral to the discussion of the research method in this chapter is the consideration and use of triangulation, which in this research study will be achieved through the collection of data using two research methods: an online survey and interviews. Triangulation is described as the process of collecting data using different methods that offer a broad view of
the issues surrounding the research problem and the practice of employing several tools or methods within the same research design (Babbie, 2004; Burns, 2000; Glesne, 2006; Sarantakos, 2005). Triangulation allows the researcher to view a particular point in research from more than one perspective, allowing them to supplement their knowledge (Babbie, 2004; Burns, 2000; Glesne, 2006; Sarantakos, 2005). According to Patton (2002), triangulation strengthens a study by using several kinds of methods of data collection, including both quantitative and qualitative approaches. Burns (2000) contends that triangulation is used “to improve the internal validity” (p.419). He adds that in the social sciences triangulation is used to map out or to explain in more depth human behaviours by studying it from more than one standpoint and by using a variety of methods. The strength in employing triangulation in this study was that by utilising different research approaches to address each research question, each research approach has the opportunity to confirm the findings of the other. Table 13 below sets out the research approach with respect to the research questions of this study.

Table 13: Research questions and research approach

<table>
<thead>
<tr>
<th>Research question</th>
<th>Research approach</th>
</tr>
</thead>
</table>
| 1. What are the key skills and professional development learning needs of digital content workers working in micro businesses? | • Survey  
• Interviews |
| 2. What approaches do they undertake in their skill and professional development? | • Survey  
• Interviews |
| 3. What is the role of the informal learning network in the digital content worker’s skill and professional development? | • Interviews |
| 4. How do these informal learning networks operate?                              | • Interviews |

A quantitative approach utilising an online survey was used to identify the skills and professional development approaches used by professionals working in micro businesses in
the digital content industry. The objective of this phase was to not only to better understand
the nature of the skills and professional development approaches within the digital content
industry but also to inform the qualitative (interview) phase of this research study.

A qualitative approach that employed semi-structured interviews was used to partially
address all four research questions. Based on the views offered from some writers such as
Creswell (2005), Gall, Gall, & Borg (2003), and Guest, Bunce, & Johnson (2006), eight
interviews were conducted with individuals from a small cross-section of micro businesses in
the digital content industry. The interview phase of this study was aimed at partially
addressing all four research questions. In so doing, the interview data further expanded and
explored the emergent themes that were identified in the survey phase, as well as identifying
the role and function of informal learning networks.

**Phase 1 – Online survey**

**Introduction**

An online survey was administered to digital content professionals to partially address
research questions one and two, which focused on the skills needed for digital content
professionals and the approaches they undertake in their ongoing skill and professional
development. A survey approach was undertaken to gather this information directly from the
professionals working in the industry on the skills needed to operate in the industry, the
approaches taken for skill and professional development, as well as drawing a picture of the
industry through some broad generalisations.

A survey is an instrument that is used to gather information through a set of specified
questions to describe the characteristics, beliefs, opinions and attitudes of a group of people
(Creswell, 2005; Sarantakos, 2005). Surveys are recognised as an appropriate method of
collecting data from a large number of respondents that is too large to directly observe
also report that surveys have a range of advantages, including accessing a large and widely dispersed population, gathering data in an unobtrusive way, reducing bias or errors of the interviewer, minimising time requirements of the respondents, and offering greater anonymity. For this present study, in order to access a wide cross-section of professionals working in the industry, an online survey that provided for no interviewer bias was launched and the survey responses were treated as anonymous; names and email addresses were not captured as part of the data collection.

A survey can be administered using many different techniques including personal interviews, telephone interviews, direct mail, self-administered and online (Babbie, 2004; Creswell, 2005). In this phase of the study, the data collection technique used was an online survey. Online surveys will be discussed in more detail later on this chapter.

Survey design and development

An online survey was developed that collected the demographic data of the respondents, and identified the skills required in their role in the digital content industry and their approaches to professional development.

Gall et al (2003) advocate a set of guidelines in survey design, which included keeping the survey short, organising questions in an easy manner, including a cover letter and avoiding double-barrelled questions. In the development of the survey for this study, these principles were utilised as guidelines through minimising the number of questions, offering a link to the survey information sheet, and the development of carefully worded questions which provided explanations if needed.

The online survey was structured into two sections. Section one was designed to collect background information known as demographic data which included the respondent’s age, gender, years of experience, their role in the industry, other qualifications, work history, and professional certification. As discussed in the literature review an individual develops
their skills and ongoing development through work practices and by informal methods through their social and business relationships. The questions in this section of the survey also highlighted the length of time in their current position, their current business and similar positions in other businesses, levels of tertiary study offered indicators of experience, gained some insight into their depth of knowledge, experience and development pathways and approaches to their skill and professional development.

Section two of the survey focused on the learning and professional development approaches taken by the respondents. This section utilised a combination of a Likert-type interval scale question to indicate the level of acceptance and attitude to several informal learning approaches, closed questions with yes/no responses, multi-choice answers, and open questions that allowed the respondent to offer their views in their own words (Babbie, 2004; Bryman, 2008; Sarantakos, 2005). The information described in this section was selected using a specific rationale to develop the questions and was directly linked to the intended outcome of partially addressing the first two research questions. Table 14 below shows the alignment of the research questions to the survey questions, and the type of survey question. The survey that was developed and administered for this phase of the study is attached at Appendix 1.
<table>
<thead>
<tr>
<th>Research question</th>
<th>Survey question</th>
<th>Survey question type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1 - What are the key skills and professional development learning needs of digital content workers working in micro businesses?</td>
<td><em>Skills and learning needs</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q13 - The most important skill and professional learning needs in the industry</td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q14 - The respondents <em>most</em> important skill and professional learning needs</td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q15 - The respondents most important <em>future</em> skill and professional learning needs</td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td><em>Professional development topics and interactions</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q19 - Number of interactions with <em>work colleagues</em> using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q20 - Skill and professional development topics discussed with <em>work colleagues</em></td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q21 - Number of interactions with <em>contacts outside their business</em> using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q22 - Skill and professional development topics discussed with <em>contacts outside their business</em></td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q23 - Number of interactions with <em>friends, relatives, etc</em> using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q24 - Skill and professional development topics discussed with <em>friends, relatives, etc</em></td>
<td>Open-ended question</td>
</tr>
<tr>
<td>Research question</td>
<td>Survey Question</td>
<td>Survey question type</td>
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<tr>
<td>RQ2 - What approaches do they undertake in their skill and professional development?</td>
<td><strong>Formal education</strong></td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q3 - Formal education and training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q16 - Formal education and training undertaken in the past 12 months</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td><strong>Informal learning</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Q17 - Attitude to the importance of Books, Blogs, Online networking sites, consulting with work colleagues, contacts outside their business, and friends, the use professional journal and magazines, and attending conferences as an informal learning approach</td>
<td>Likert (interval) scale question</td>
</tr>
<tr>
<td></td>
<td>Q18 - Other informal learning approaches used</td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q19 - Number of interactions with work colleagues using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q20 - Skill and professional development topics discussed with work colleagues</td>
<td>Open-ended question</td>
</tr>
<tr>
<td></td>
<td>Q21 - Number of interactions with contacts outside their business using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
<td>Multi-choice (with drop-down box choices)</td>
</tr>
<tr>
<td></td>
<td>Q22 - Skill and professional development topics discussed with contacts outside their business</td>
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</tr>
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<td></td>
<td>Q23 - Number of interactions with friends, relatives, etc using phone, email, SMS, blogs, online networking sites, and face-to-face discussions</td>
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<td>Research question</td>
<td>Survey Question</td>
<td>Survey question type</td>
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<tr>
<td>Demographic data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q2 - Current main occupation</td>
<td>Closed (categorical) question</td>
<td></td>
</tr>
<tr>
<td>Q4 - Years of experience in the industry</td>
<td>Closed (categorical) question</td>
<td></td>
</tr>
<tr>
<td>Q5 - Digital content industry career path</td>
<td>Multi-choice (with drop-down box choices)</td>
<td></td>
</tr>
<tr>
<td>Q6 - Have you worked in digital content roles in other industries?</td>
<td>Closed (nominal) question</td>
<td></td>
</tr>
<tr>
<td>Q7 - Specify the digital content role occupations in other industries</td>
<td>Multi-choice (with drop-down box choices)</td>
<td></td>
</tr>
<tr>
<td>Q8 - Have you worked in non-digital content occupations in other industries?</td>
<td>Closed (nominal) question</td>
<td></td>
</tr>
<tr>
<td>Q9 - Specify the non-digital content occupations in other industries</td>
<td>Multi-choice (with drop-down box choices)</td>
<td></td>
</tr>
<tr>
<td>Q10 - Professional or association membership</td>
<td>Closed (categorical) question</td>
<td></td>
</tr>
<tr>
<td>Q11 – Age</td>
<td>Closed (categorical) question</td>
<td></td>
</tr>
<tr>
<td>Q12 - Gender</td>
<td>Closed (nominal) question</td>
<td></td>
</tr>
<tr>
<td>Survey eligibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q1 - Eligibility to undertake the survey</td>
<td>Closed (nominal) question</td>
<td></td>
</tr>
</tbody>
</table>
The development of the questions in section two of the survey was informed by a number of sources as there was not one clear list of skills, competencies or taxonomy that encompassed the industry; rather, the lists tended to be generic and not industry-specific enough.

*Development of survey questions*

An important issue that should be addressed at this point is the definition and scope of skills. Many of the empirical and theoretical works that address the issue of the skills gap or the need for professionals and skilled workers include definition of skills and concepts such as problem solving and critical thinking skills, technical skills, interpersonal skills, adaptability, and job specific competencies (Handel, 2003).

In reviewing and scanning the literature for taxonomies, skill sets and competencies for professionals in the digital content industry, there was not one comprehensive list that suitably covered the various occupations. What was discovered was a variety of themes, ideas, methods of learning, professional development approaches, and generic skill sets from a number of writers. In the end, it was combination of several documents that provided the key inputs for the basis and development of the questions in the survey, and they were also used to aid in the coding of the survey responses.

The questions within the survey were developed to reflect the skills, competencies, professional development and career learning approaches described by a number of writers such as Binkley et al (2010), Cheetham & Chivers (2001), Eraut (2004), Forfas (2007), Jenkins, Clinton, Puroshotma, Robinson & Weigel (2006), ITSE (2007), Pickard (2007), Reiter-Palmon, Young, Strange, Manning & James (2006).

In researching the theoretical frameworks for understanding and investigating informal learning in the workplace, which have been developed through a series of large- and small-scale projects, Eraut (2004) developed a framework regarding what is being learned via
the workplace through informal learning, learning from experience, knowledge transfer and learning through intuitive practice. Eraut (2004) notes that “both knowledge and learning can be examined from two perspectives, namely the individual and the social” (p.263). He also identifies four key constructs that focuses on the individual’s perspective with respect to how knowledge and learning is developed: the social perspective of knowledge construction, codified knowledge from “textual material such as organisation-specific information” (p.263), cultural knowledge that is work related, and skill development in the form of personal knowledge. To this end, Eraut (2004) develops what he terms “a typology” (p.265) which describes some of the aspects of learning within an individual’s context. In his typology, Eraut (2004) identifies seven broad categories of workplace performance attributes: task and role performance, awareness and understanding, academic knowledge, personal development, decision making, teamwork, and judgement. It is these seven categories that provided the basis for the development of the questions and statements for the generic skills part of section two in the questionnaire.

Johnson (1997) argues for a need to learn technological concepts and for the development of intellectual skills. He writes “the increasing complexity of work and social life demands that people possess conceptual understanding and intellectual skills in order to gain the desired level of competence” (p.161). Johnson (1997) identifies Royer’s (1986) taxonomy for educational goals with respect to technical education and learning. Those learning goals he suggests include information development, concepts and relationship development, enhancement of problem and decision-making skills. It can be noted that arguments offered by the likes of Binkley et al (2010), Eraut (2004), Forfas (2007), Jenkins et al (2006), ITSE (2007), Eraut (2004), and Reiter-Palmon et al (2006) were also largely influential in the development of the questions and statements in section two of the online survey.
In developing the questions for section two of the survey, which focused on the learning and professional development of the respondent, two key references were accessed. Cheetham & Chivers (2001) investigates how professionals learn once they are in the workplace. They cite an empirical research study of professionals, which they state relates to the formative experiences coupled with theoretical approaches to learning in the workplace. In their study, Cheetham & Chivers (2001) discuss what they call “a taxonomy of informal professional learning methods” (p.247). In citing Eraut et al (1997), Cheetham & Chivers (2001) identify nine “learning episodes” (p.268) that help and support professionals to develop their skills and to continue their professional development: qualifications, short courses, special events, learning materials, learning support, collaboration with work colleagues, challenging work, consultation outside the work group, and life outside work. The second key reference that was accessed for the development of the questions and statements in section two of the survey was Tak (2008). In a study of how IT professionals learn in the workplace, he identifies a number of “workplace activities that helped research participants develop their skills and aid their professional development” (p.133).

In summary, the survey questions were developed as an approach for gathering empirical evidence of the skills needed to work in the digital content industry, and to provide an understanding of how professionals working in the industry undertake their ongoing skill and professional development. In particular, the survey focused on areas such as their years of experience; their formal education pathway; the most important industry skills; their future industry skill needs; their attitude to informal learning approaches such as blogs, online networking sites, conferences; and consulting with work colleagues, contacts outside their business, friends and relatives. Prior to the survey being released online, it was assessed and evaluated for its relevance, accuracy and alignment to the two research questions.
Validity and reliability

Validity and reliability are important issues to consider when designing surveys. Reliability is described as the capacity of an instrument to produce consistent results by being objective, precise, consistent and stable (Creswell, 2005; Sarantakos, 2005). Babbie (2004), for instance, calls reliability “precision and accuracy ... in research measurement” (p.141), while Bryman (2008) suggests that reliability is made up of two key factors: stability and consistency. Creswell (2005) links the issue of reliability to the instrument (which in this case was an online survey) and writes: “good research is to have measures and observations that are reliable” (p.162). He identifies two key factors: unambiguous questions in the survey, and a standard set of procedures for survey administration. For the purposes of this study, survey reliability was addressed by developing and using unambiguous survey questions that directly related to the research problem, and were clear by using simple language. Finally, a uniform survey administration procedure was applied whereby the link to the survey was emailed to individuals, and all surveys were stored in a central electronic repository. The design of the online survey and the recruitment approach will be discussed later in this chapter.

These same writers (see Babbie, 2004; Bryman, 2008; Creswell, 2005; Sarantakos, 2005) also report on the link between validity and reliability. Bryman (2008) describes validity as “whether a set of indicators that is devised to gauge a concept really measures that concept” (p.72). While Babbie (2004), Cohen, Manion & Morrison (2005) and Creswell (2005) write that validity correctly reflects the ideas and notions it is intended to measure. According to Gall et al (2003) surveys need to meet some standard of validity and reliability. They suggest that in survey type data-collection the researcher is looking at the group level as well as their individual responses. Gall et al (2003) add that validity can be achieved through evidence from responses, and they highlight that researchers can also apply relationships between other variables as a valid test of the hypothesis. Sarantakos (2005) contends that
validity in quantitative research is based on an instrument that is relevant, precise and accurate, and adheres to the research question. This complements the assertions from Cohen et al (2005), who state that the instrument (the survey) should measure what it is supposed to measure.

Issues of validity were integral in the design and development of this study and to the decisions made for the collection of the data. There are a number factors related to validity in quantitative research that need to be considered when designing surveys, including empirical validation, theoretical validation, face validity, content validity, construct validity, internal validity and external validity. In this phase of the study, two areas of validity were utilised in the instrument design: content validity and face validity.

Cohen et al (2005) note that content validity can demonstrate validity through an instrument that covers the research question it purports to cover. Cohen et al (2005) contend that validity can be ensured through several factors, such as choosing an appropriate time frame, selecting an appropriate methodology, selecting and designing an appropriate instrument to gather the data and a study that adheres to its original hypothesis. Burns (2000), Gall et al (2003) and Sarantakos (2005) all concur on the key point of content validity. They argue that content validity refers to the checks that ensure the research design, method and approach, and that the questions do not impact on the outcomes of the study, but are directly related to the research problem. This includes such factors as instrument design, instrument question structure, management of instrument changes during the study, diverse methods of data-collection over the course of the study period, and inconsistent recording techniques. Content validity is also described as covering the range of meanings within a concept and all the possible scope of the research topic (Babbie, 2004; Sarantakos, 2005). Content validity in this present phase of the study was addressed by ensuring that the items in the survey reflected the intended outcomes of the research questions. Further, the survey also ensured it
reflected the skills, competencies, taxonomies, professional development and career learning approaches, described by a number of writers (see Cheetham & Chivers, 2001; Eraut, 2004; ITSE, 2003; Jenkins et al, 2006; Pickard, 2007; Reiter-Palmon et al, 2006), through the use of open-ended questions that allow the respondents to provide their own responses.

Consequently, the survey identified the skills, as recognised by the respondents, needed to work in the industry; their own future development needs; and methods they have undertaken to promote their own professional development, which may have included both informal learning and formal education and training.

Face validity is applied to an instrument which measures what it is expected to measure, with questions that reflect the concepts related to the research problem (Babbie, 2008; Sarantakos, 2005). This form of validity was applied to this survey in the form of a pilot, and will be discussed later in the pilot stage of this chapter.

**Online surveys**

The intent of the study was to explore how informal learning via social networks contributes to skill and professional development of workers in the digital content industry. With the intended sample group of digital content professionals being widely dispersed across Australia, it was felt that an online survey would provide the best form of access to the digital content workforce population.

To illustrate the use of online surveys as a data gathering tool, Hoonakker & Carayon (2009) suggest “rapid advances in computer technology, and more specifically the internet, have spurred the use of the internet surveys for data collection” (p.348). So much so that in 2009, in an informal Google search, Hoonakker & Carayon (2009) identified more than 736,000 online or web-based surveys. Hoonakker & Carayon (2009) identify four main methods for conducting online surveys: a survey questionnaire embedded in an e-mail message, a survey questionnaire attached as a Microsoft Word document to an e-mail
message, a survey attached as a self-executing program in an e-mail, and an online-based survey.

An online survey was chosen for this phase of the study due to: (1) the nature of the work of the digital content professionals, which would typically involve regular access to computers and the internet; (2) it providing ease of access to a large population; (3) it producing high response rates compared to direct mail surveys; (4) open-ended questions that can elicit more information from the respondents (Creswell, 2005; Hoonakker & Carayon, 2009).

The intended population of this research, professionals working in the digital content industry, are well suited to the use of an online survey, as they typically work and operate at the forefront of technology, and the online survey allowed the researcher to reach thousands of people with common characteristics in a short amount of time, despite being separated by great geographic distances (Bachmann, Elfrink, & Vazzana, 1996; Creswell, 2005; Hoonakker & Carayon, 2009; Kaye & Johnson, 1999). In justifying the use of online surveys over the traditional mail survey, Guterbock, Meekins, Weaver & Fries (2000) note a “tremendous growth in web-based surveys” (p.341) and conclude that online surveys typically produce higher response rates than mail surveys.

The application and the design of online surveys is taken up by Bachmann et al (1996, 1999), Mehta & Sivadas (1995) and Schaefer & Dillman (1998), who argue that respondents are more willing to give extra information and to answer open-ended questions than in the traditional mail survey. To this end, Best & Krueger (2004) surmise that survey design, configuration, colour and appearance, relevance to the potential respondent, and length are design factors that should be taken into consideration (Hoonakker & Carayon, 2009). For this study, Key Survey was used to design and deploy the online survey, as QUT has an enterprise-wide license for the software. It is argued that the advantages to using the Key
Survey software included that it easily integrates and downloads to SPSS and Microsoft programs, there is no software to install or download, it is easily accessed from anywhere using an internet browser, and it can handle any number of respondents (Key Survey, 2011).

Hoonakker & Carayon (2009) argue that “edit control – forcing respondents to answer all questions properly is an important design issue ... can prevent non-response or inconsistent responses” (p.365). To this end, the edit control function in the online question design for this survey was enabled through the Key Survey software by setting a rule for all the questions, which forced the respondent to answer each question in the survey. It is worth noting that there were two questions in this survey that were optional. These were two opt-in questions at the end of the survey that asked the respondents for their email address, to either receive a copy of the survey findings or to enter a draw for a gift card. Hoonakker & Carayon (2009) conclude that “the same design factors apply as for the mail survey ... they include sponsorship, incentives, the targeted population, and question design” (p.367).

A combined approach utilising purposive, snowball and convenience sampling was used to access the rather large and dispersed digital content workforce.

**Sampling**

Sampling is described as a subgroup of individuals from target population that the researcher intends to study for the purpose of making some generalisation about the target population (Babbie, 2004; Creswell, 2009; Gall et al, 2003).

Sampling approaches for online surveys is discussed by a number of writers (for example Andrews, Nonnecke, & Preece, 2003; Couper, 2000; Kaye & Johnson, 1999; Swoboda, Muhlberger, Weitkunat, & Schneeweib, 1997; Tuten, 1997; Yun & Trumbo, 2000). Andrews et al (2003) and Couper (2000) identify six main approaches to developing a sampling frame for an online survey. They are the random sample, a stratified sample, email address identification, convenience sampling, purposive sampling, and snowball sampling.
For the purposes of this study three approaches to sampling were undertaken: purposive, convenience and snowball sampling.

Acknowledging the nature of the target population and that the true size of the sampling frame may not be easily identified (Couper, 2000), a purposive sampling approach was used. Purposive sampling provides a number of advantages to the researcher, which includes access to respondents who are relevant to the research topic, are relevant to the research questions, and who form part of the wider targeted population (Babbie, 2004; Bryman, 2008; Sarantakos, 2005). According to Kaye & Johnson (1999) the online environment is conducive to purposive sampling in that the subsets within the wider population can be “identified and solicited through announcements and links posted on key online sites and topic related discussion groups” (p.326). Kaye & Johnson (1999) also note, in citing Babbie (2004) and Wimmer & Dominick (1991), that purposive sampling can generate results that that may be representative of a specific subset of the population. This view is in line with the initial recruitment approach taken for this phase of the study. In the first stage, businesses were invited to participate via email and were sourced from AIMIA’s current membership database. The 440 businesses were identified in the database as being either a small to medium enterprise (SME) or a sole trader. An approach email was prepared by the researcher (see Appendix 3) asking them to participate in the survey, and provided other details, such as the link to the online survey, the focus of the study and a link to the Participant Information sheet (see Appendix 2). Contact with individuals and businesses regarding participation in the survey was managed by AIMIA’s membership coordinator; the researcher did not have direct access to the business contact details.

In the final stage of recruitment of survey respondents, the online Yellow Pages directory was used to identify and approach businesses and individuals to participate. This stage was highlighted by the use of a large-scale convenience sample. Convenience sampling
was described as a sample of individuals or groups drawn from the population that suits the purposes of the study and the researcher, and by virtue of their accessibility to the researcher (Bryman, 2008; Gall et al, 2003). Bryman (2008) argues that this type of sampling is quite common in social research situations. In the final stage of the recruitment for the survey, a large-scale convenience sample was utilised where the researcher, by searching via the online Yellow Pages, was able to identify a large number of businesses within each sector of the digital content industry. Only those businesses with listed email addresses were approached to participate in the survey, as they were available at the time to the researcher by virtue of the fact that they were sourced through the Yellow Pages and had an email address attached to their business. A summary of the recruitment approach to the survey of the study will be discussed later in this chapter.

The other form of sampling utilised in this phase of the study was snowball sampling, a form of non-probability sampling (Babbie, 2004). Snowball sampling in quantitative research is an approach where the survey is recommended to other people who meet the criteria of the research and might be willing to participate in the study (Babbie, 2004; Sarantakos, 2005). How this form of sampling was undertaken in the present study will be discussed later, in the recruitment section of the survey phase.

Prior to the survey being released and posted online, it was piloted, which is “crucial to achieving research goals” (Andrews et al, 2003, p.199). The pilot phase begins preparation and planning for the fieldwork and data analysis, and attempts to ensure that nothing has been missed or left out in the survey (Oppenheim, 1992).

Survey pilot

The format and structure of surveys should be piloted as it serves to test such factors as sequencing, language, suitability and overall design, and is typically a small-scale replica of the main study in order to help solve isolated mechanical problems (Sarantakos, 2005).
Another key facet of the pilot stage was the consideration of face validity, which was aimed at making sure the survey “adequately reflects the real meaning of the concept under consideration” (Babbie, 2004, p.143) and test at face value what the instrument was designed to test (Cohen et al, 2005).

The online survey in this study was piloted with a number of industry professionals and practitioners. The link to the online survey was sent to seven qualified practitioners from varying backgrounds within QUT from across the digital content industry. The pilot was aimed at trialling the survey and determining its relevance with respect to the intent of the research study and industry alignment. The survey was specifically reviewed for clarity, appearance, question wording, readability, ease of understanding, choices that do not make sense, and time taken to complete the survey.

The knowledge of the industry practitioners and their experience were valuable for ensuring the survey would be appropriate to the target audience in terms of questions related to the industry specifically, the respondents, wording of the questions, and that the questions represented and aligned to industry concepts. A total of five completed and one partially completed survey was submitted by the pilot group and, based on the feedback from the pilot group, no changes were suggested to the online survey.

Recruitment

The data collection for the survey phase of the study was undertaken in three stages from mid March 2011 to early May 2011. In the first stage digital content professionals who were current members of AIMIA were invited to participate via email.

An approach email was prepared by the researcher (see Appendix 3) asking potential respondents to participate in the survey and provided such details as the link to the online survey, the focus of the study and a link to the Participant Information sheet (see Appendix 2). The information sheet was designed and based on recommendations that it should
introduce the study and the survey to the respondents (Sarantakos, 2005). Sarantakos (2005) advises that provision of an information sheet will assist in neutralising any doubt or mistrust the respondents may have about the study and motivate the respondents to participate. It must ensure anonymity, confidentiality and be clear about issues related to ethics.

Hoonakker & Carayon (2009) take up the issue of sponsorship, or the From part of the email and the subject line of the email, approach to the potential respondents as further consideration in survey design and distribution that would need to have “a positive impact on participation” (p.363). Similarly, Coomber (1997), Tuten (1997) and Vehovar, Batagelj, Lozar, & Zaletel (2002) state that the e-mail subject line is extremely important for catching the attention of respondents and for encouraging their participation. However, Andrews et al (2003) argue that there may be little a researcher can do to persuade someone to participate if they prefer not to participate. In this stage of the recruitment, AIMIA’s membership coordinator agreed to email all members from their database listed as either a sole trader or an SME, as the target group of this study were micro businesses from across the digital content industry.

Ten days after the survey was launched, a reminder email was distributed by AIMIA’s membership coordinator to the same 440 sole trader and SME member businesses. After two weeks of the survey being in the field, 31 completed surveys and 12 incomplete surveys were received, with a total of 133 individuals visiting the online survey page. The second stage of data collection covered the period from late March to early April 2011. During this stage the researcher directly emailed the 440 sole trader and SME member businesses from AIMIA’s member listing. The email addresses were sourced through the online Yellow Pages listings. After this promotion campaign, 51 completed surveys and 23 incomplete surveys were received, with a total of 213 survey page visits. It was agreed at this time that a more direct promotion and participant recruitment approach was needed to significantly increase the
response rate in order to obtain meaningful data from this phase of the study. The final stage of the recruitment campaign (the period from early April to early May 2011) was approached in three ways. Firstly, emails were sent to event and conference organisers of six different upcoming conferences related to web development design, animators, games, online marketing, film/TV/audio and e-publishers. The second wave involved approaching 30 online forum organisers across the various capital cities that were focused on a number of different sectors within the digital content industry, such as animators, graphic designers, apps developers, web designers, online marketing services, and film/TV/audio production professionals. The third and final approach involved a search of the online Yellow Pages directory under the key areas within the digital content industry. The searches focused on web development and design, apps developers, graphic designers, online marketing services, games developers, film/TV/audio production studios, animation and illustration studios, and e-publishing businesses. The intent and thrust of this direct email approach was to significantly increase the take up rate, expand the awareness of the survey and increase the response rate, as well as to directly approach the various businesses, event organisers and online forum organisers to assist with promoting the study within their area. The emails also asked for the survey link be forwarded on via email, sent via a tweet or posted on professional forum pages; that is, they utilised snowball sampling. Babbie (2004), Bryman, (2008), Creswell (2005), Krathwohl (2004) and Sarantakos (2005) identify snowball sampling as being useful for expanding the sample by asking potential respondents to communicate or recommend the survey to others. A sample of the email used for this stage of the recruitment is provided at Appendix 4.

The recruitment approach described for this online survey is validated by a number of writers (see Andrews et al, 2003; Kaye & Johnson, 1999; Yun & Trumbo, 2000) who advocate the view that the use of publication and recruitment through a number of avenues,
such as internet sites, online forums, and posting announcements on message boards, assists in creating awareness across the population base.

To assist in increasing the response rate, and in recognising the respondents’ time commitment and contribution to the survey, the researcher provided respondents the opportunity to enter a draw for one of five $50 gift cards from JB Hi-Fi if they elected to participate. Giving individual email addresses was an opt-in question, but was required to enter the draw at the end of the survey for those respondents who chose to enter the gift card draw. A number of writers (Babbie, 2004; Bryman, 2008; Creswell, 2005; Downes-Le Guin, Janowitz, Stone, & Khorram, 2002; Frick, Bachtinger, & Reips, 2001; Sarantakos, 2005) note that offering rewards or monetary incentives can increase the response rate of surveys, and are seen as a having a positive effect on potential respondents in completing the survey.

Response rate

At the close of the survey period (close of business 6 May 2011), 198 completed surveys and 32 incomplete surveys were received, with a total of 546 survey page visits. This represented a total of 184 completed surveys. Of the completed surveys, 14 respondents answered No to the survey eligibility question which asked:

*The digital content industry includes commercial art, film and video, photography, electronic games, recorded media, sound recording, information storage and retrieval sectors. To be eligible to participate in this survey you must be working in the digital content industry, as either a sole trader or in a small to medium enterprise, and a member of the Australian Interactive Media Industry Association (AIMIA). Would you describe yourself as currently working in the digital content industry as either a sole trader or in a small to medium enterprise, and a member of AIMIA?*

Table 15 below summarises the direct email recruitment approach for the online survey, and gives an indicative number of completed surveys from each group.
Table 15: Direct email recruitment summary

<table>
<thead>
<tr>
<th>Business type</th>
<th>Total listing (as per Yellow Pages)</th>
<th>Total number emailed</th>
<th>Number of completed surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apps developers, web developers, and graphic designers</td>
<td>6843</td>
<td>720</td>
<td>64</td>
</tr>
<tr>
<td>Internet marketing business</td>
<td>268</td>
<td>145</td>
<td>41</td>
</tr>
<tr>
<td>Film/TV, and audio production studios</td>
<td>35</td>
<td>35</td>
<td>33</td>
</tr>
<tr>
<td>Animation and illustration studios, and games developers</td>
<td>190</td>
<td>133</td>
<td>30</td>
</tr>
<tr>
<td>e-publishers, and platform managers</td>
<td>78</td>
<td>64</td>
<td>16</td>
</tr>
<tr>
<td>Totals</td>
<td>7414</td>
<td>1097</td>
<td>184</td>
</tr>
</tbody>
</table>

A total of 184 completed surveys and 32 partially completed surveys were received out of the 1097 emails sent in stage three of the recruitment campaign. Calculating the response rate for an online survey is challenging given the email approaches described earlier and the widespread nature of the internet. Kaye & Johnson (1999) argue that the response rate of an online survey cannot be calculated because there is no real way in which to know how many individuals might have seen the survey or its links but declined to participate. What can be ascertained is the number of completed and incomplete surveys as well the number of times a site has been accessed.

The data gathered in this survey was used to highlight the characteristics and features of the digital content professionals who responded to this survey. In accordance with statistical rules about generalisability of findings from samples of populations, caution was used in this study when making population-related inferences from the statistical analysis of the sample data (Bryman, 2008, Creswell, 2005; Gall et al, 2003).
Data analysis

Statistical analysis was conducted on the survey data to partially address research question one and two. The stages of analysis were data cleaning and coding, and data analysis.

Data cleaning and coding

Data cleaning and coding is important as it prepares and organises the data collected by the survey in preparation for analysis (Babbie, Halley, Wagner, & Zaino, 2011). This step initially involved electronically downloading the data from Key Survey into Excel which allowed for some manipulation of the data, and was then downloaded into SPSS which ultimately allowed the data to be coded in preparation for data analysis.

The use of the Key Survey software allowed for the data to be collected electronically and downloaded into an Excel spreadsheet. Some manipulation of the data within Excel was required before the data was imported to SPSS. Once the data was exported into Excel, the first was step was to clean the data and examine the dataset for missing or incomplete responses (Creswell, 2005). This work was significantly reduced by the use of the online survey, which was designed to ensure that respondents answered each question, except the final two questions, related to obtaining the survey findings and entering the gift card draw, which were optional. The survey did record 32 incomplete surveys, where the respondents simply closed the web browser to exit the survey. The data from the incomplete surveys was reviewed, and it was determined that if a respondent answered up to and including either questions 13, 14 and/or 15 (the skill and professional development questions – which was the primary aim of this phase of the study) they would be included in the data analysis and reported accordingly. On examining the incomplete surveys, it can be reported that no respondent provided answers to the skill and professional development questions, therefore the data gathered from the incomplete surveys were excluded from the data analysis. It is also
worth noting that ten respondents (31%) exited the survey at question ten (which asked whether they were a member of any other industry association or professional body). Additionally, those respondents who answered No to the survey eligibility question (14) were eliminated from the data set and the data analysis.

The data was imported into SPSS, and the variables were defined and labelled ready for statistical analysis. It can also be reported that there were nine open-ended questions in the survey, which were imported into SPSS as string variables. These responses were categorised into similar groupings and were coded as numerical variables; however, the verbatim responses were retained in the Excel data file for future reference if required.

**Statistical analysis**

The first stage of analysis involved drawing descriptive statistics in relation to the various questions within both sections of the survey. Descriptive statistics are used to describe and summarise the overall trends and tendencies of a study (Creswell, 2005). Gall et al (2003) write that descriptive statistics are mathematical techniques for organising and summarising a set of numerical data. This stage of analysis allows for an initial overview of the findings and provides the researcher with an opportunity to identify trends in the data (Creswell, 2005). For the purposes of this study, the descriptive statistics provided overall trends, tendencies and patterns, and a better understanding of the results from across the group of survey respondents.

Inferential statistics, on the other hand, can assist in comparing groups within the sample or relate two or more variables (Creswell, 2005). This is based on the idea of hypothesis testing, which focuses on two methods: the null hypothesis, which states there is no difference or relationship between scores, or the research hypothesis, which is based on the fact there is a relationship between the scores. For the purposes of this study, the
inferential statistics provided both a broader understanding of, and a contrast between, the sets of groups within the wider respondent group.

Both research questions for this phase of the study were descriptive in nature and asked for the respondent’s views on the skills needed within the digital content industry and the professional development approaches they utilised. These were analysed primarily by applying descriptive statistics, while inferential statistics were used to draw broader conclusions across the respondent group and, ultimately, about the population.

**Phase 2 - Interviews**

**Introduction**

Phase one of this research study, the online survey, was aimed at exploring and identifying the skills needed and the professional development approaches undertaken by digital content professionals. Based on the literature review, a research design framework was developed which utilised an interview approach to partially address all four research questions. This was considered to be the most appropriate approach for this phase of the study.

The intent of the interview phase was to explore the notion of how informal learning networks contribute to the ongoing skill and professional development of individuals in the industry. Eight interviews were conducted with a number of professionals from a small cross-section of micro businesses in the digital content industry in the Brisbane area.

This section will outline and explain the interview phase for this phase of the study with regards to question development and the collection and analysis of the interview data.

**Interview process development**

An interview in a social research context entails the administration of a series of questions to an individual where the interviewer orally reads out a question, typically from a pre-determined schedule of questions (Bryman, 2008; Creswell, 2005; Patton, 2002). Glesne
(2006) argues that one of the key approaches to qualitative research is the use of interviews, which are typically used to gather in-depth expert knowledge and to gain a better perspective from the participants of the research topic.

There are six main types of interviews used within the qualitative research area. They are: structured, standardised, semi-structured, unstructured, intensive, and the focus group. For this phase of the study, a semi-structured interview approach was utilised for two reasons. Firstly, a semi-structured interview helped build on the themes and ideas generated from the online survey, and, secondly, it “allows the interviewer some latitude to ask further questions” (Bryman, 2008, p.113), or expand on certain themes within the interview context. In this present sense, as it related to skills requirements and approaches undertaken by professionals in the digital content industry.

It is argued that semi-structured interviews can be utilised as an effective data gathering method (Burns, 2000; Patton, 2002). A number of writers (such as Bryman, 2008; Burns, 2000; Patton, 2002) suggest that rather than having a fixed set of questions, an interview guide could be used, and the direction for the interview could be driven by the content and topics key to the study being discussed within the interview setting. The concept of semi-structured interviews is also described by Bryman (2008), who explains that questions may not necessarily follow as per the guide that has been developed, but it “picks up on the things said by the interviewees” (p.321). Burns (2000) also contends that semi structured interviews offer the researcher a number of advantages, which include: (1) greater time is spent with the interviewee; (2) the interviewee’s perspective is provided rather than that of the interviewer, the interviewee uses language that fits into the themes of the study; (3) the interviewee has equal status with the researcher. Patton (2002) supports this point when he argues that “a combined strategy offers the interviewer flexibility in probing and in determining when it is appropriate to explore certain subjects in greater depth, or pose other
questions not anticipated in the interview development” (p.347). Patton (2002) also supports the notion of an interview guide. He suggests a set of interview questions be developed to get information from the interviewees, as it provides the researcher a focus for the interview with a set of questions to be asked, while also allowing for further exploration of themes or ideas that may arise in the interview. Patton (2002) suggests that probing and follow-up questions “are used to deepen the response to a question, increase the richness and depth of responses, and give clues to the interviewee about the level of response that is desired” (p.372).

When using any form of interviewing, following a quality process is important to reliable data collection (Bryman, 2008; Glesne, 2006; Patton, 2002). The interview process should be designed to allow for time to establish rapport, gain consent from the respondent, time to conduct the interview, summarise and clarify at the end, and formally close the interview (Bryman, 2008; Creswell, 2009; Patton, 2002, Sarantakos, 2005). Bryman (2008) argues that it is important to outline the research topic at the beginning of the interview “to indicate what the research topic is about, why it is important ... and the kind of information to be collected” (p.118). At the end of the interview “care should be taken to end the interaction between the interviewer and the respondent smoothly, and in a friendly atmosphere ... so that the respondent feels that the contribution made to the research has been appreciated” (Sarantakos, 2005, p.277). Other considerations that were taken into account in the interview research design for this phase of the study included the use of unbiased questions and the use of clarifying and rephrasing techniques by the interviewer, and the interview was recorded and notes were be taken during the interview (Glesne, 2006, Patton, 2002).

For the purposes of this phase of the study the following process was developed to ensure a quality approach to the interviews:

- Ethical clearance was granted as a separate application for this phase of the study through an amended research ethics application;
The interviewee was provided with an information sheet that outlined the intent of the research study prior to the interview being conducted;

Informed consent was gained from the interviewee prior to the interview being conducted;

Verbal explicit permission was sought from the interviewee to record the interview; and

A formal interview closure process was used to summarise the interview.

Finally, it can be noted that all the interviews were digitally recorded using a voice recorder for the purposes of transcription, and interview content analysis.

**Question development**

The development of the interview questions should be strongly tied to the research questions (Glesne, 2006). There is, she suggests, a clear relationship between the research questions and the interview questions, and their development requires “creativity and insight, rather than a mechanical translation of the research questions into the interview guide” (p.81).

Significantly, Creswell (2009) notes that “research sub-questions in turn can be used as specific interview questions during the interview process” (p.130).

Patton (2002) provides sound advice in the development of interview questions. He offers three approaches to interviewing: the informal conversation, the interview guide, and the standardised open-ended interview. The fundamental principle of the qualitative interview approach is to provide a framework within which the participants can express their own understanding in their words. In this phase of the study, a combined conversation and open-ended interview approach was used to partially address all four research questions.

A semi-structured interview schedule of questions (see Appendix 5) was developed that focused on exploring all four research questions areas related to skill requirements, approaches undertaken by the interviewees, and the role and function of informal learning networks as part of their skill and professional development. The interview questions were
developed based on the key themes and responses gathered from the survey phase of this research study, and in conjunction with the skills, competencies and lists of taxonomies and frameworks, and professional development approaches, identified in the literature (such as Cheetham & Chivers, 2001; Eraut, 2004; ITSE, 2003; Jenkins et al, 2006; Reiter-Palmon et al, 2006). Additionally this phase of the study also utilised Patton’s (2002) method of a combined approach of semi-structured questioning, coupled with the collection of contextual data and information from the businesses in which the interviewee’s worked. All of these considerations provided a sound approach to interviewing, while also increasing the reliability of the data collection (Glesne, 2006; Sarantakos, 2005).

**Validity and reliability**

Validity and reliability is also applicable to a qualitative approach to research. While this phase of the study utilised a qualitative approach, there were certain aspects that were taken into account in relation to validity and reliability. Burns (2000) identifies a number of potential issues related to the qualitative research approach which include subjective bias, generalisation, reliability and validity.

Subjective bias is the first concern often raised in relation to interviews. It is claimed that this type of research has the potential to allow the personal views or presuppositions of the interviewer to influence the outcomes of the study. While this may be a valid concern, it is no less applicable to other investigation methods including those considered quantitative in nature (Burns, 2000). Nonetheless, this potential for subjectivity can be minimised through multiple interviews being conducted, as well as multiple sources being sought.

In terms of trustworthiness of this approach to data collection, Lincoln & Guba (1985) assert that it is about persuading the audience that the findings of the study are worth considering, with respect to its outcomes and the questions asked. Lincoln & Guba (1985) also suggest utilising an effective and efficient research approach through record keeping.
predetermined set of interview questions and allowing the participants direct access to the content, would avoid the potential impact of interviewer bias. Sarantakos (2005) argues for the importance of an interviewer who is actively searching for areas of subject convergence or divergence within the data that is collected, who can thus “interpret and discuss the data together and evaluate the consequences” (p.90), and, in turn, improve trustworthiness.

The second concern raised by Burns (2000) is the lack of generalisability, identifying that interview outcomes are not able to be generalised to a wider population. A number of steps were taken to enhance the trustworthiness of the data. A strong focus was placed on the recoding of interviews, and the subsequent transcription was conducted as soon as practicable following the interview, as it allowed the researcher to check and review the interview content.

Reliability is the third issue raised by Burns (2000), who notes that in using a qualitative approach “it is impossible to establish reliability in the traditional (statistical) sense” (p.475). However, in this case, reliability related to the stability and accuracy of results. Qualitative researchers often refer to trustworthiness of data (Glesne, 2006) rather than reliability. For the purposes of this phase of the study, reliability was achieved through documented procedures, the checking of transcripts and a documented set of interview questions.

The final consideration identified by Burns (2000) is that of validity. In basic terms, this means it “is based on determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers” (Creswell, 2009, p.191). It is suggested that this could be achieved through the use of pattern matching, which has been proven to strengthen the internal validity of the interview approach (Burns, 2000). Along the same line, Creswell (2009) argues for “the use of multiple strategies” (p.191) to assess the accuracy of the findings. For the interview phase of this study, validity was applied through the
triangulation of findings from the survey phase with the interview data, review of interview outcomes by the interviewees, and the presentation of negative or discrepant information and comments. It is also worth noting that in presenting the findings from qualitative studies there should be an intent to transport the reader to the setting through “rich, thick descriptions to convey the findings” (Creswell, 2009, p.191), so the reader can relate it to their own context and they can find the results applicable and relevant (Burns, 2000; Creswell, 2009). Once the interviews were conducted, they were then analysed in order to identify and gather the interview findings.

Sampling

Sampling approaches for interviews have been identified by a number of writers (for example Bryman, 2008; Gall et al, 2003; Miles & Huberman, 1994; Patton, 2002). They are purposive sample, maximum variation sample, stratified sample, snowball sample, and a theoretical sample. Patton (2002) adds “there are no rules for sample size in qualitative inquiry, sample size depends on what you want to know, the purpose of the inquiry ... and what will be useful” (p.244). For the purposes of this phase of the study, a purposive and a maximum variation sample was used because “most writers on sampling in qualitative research using interviews recommend that purposive sampling is conducted” (Bryman, 2008, p.333), but these forms of sampling also provided excellent relevance and alignment to the research questions, as well as providing a diverse range of interviewees, which offered a variation of dimensions related to the research topic (Bryman, 2008; Gall et al, 2003; Patton, 2002). This phase of the study used purposive sampling, which allowed the researcher to target the interviewees and businesses on the basis of their sector within the digital content industry and that they worked in a micro business. With respect to the application of a maximum variation sample, Gall et al (2003) and Patton (2002) argue that this type of sampling approach is applied by picking a wide range of respondents from within the
population to get a variation of experiences and characteristics, and a range of dimensions, pertaining to the research topic.

Typically, purposeful and maximum variation sampling offers the best approach for interviews, as it provides rich data from a wide-ranging, strategically and purposefully selected set of individuals (Patton, 2002). Gall et al (2003) contend that the sample size in a qualitative research design is affected by the purposeful sampling approach and contend that at least ten participants be interviewed. This is supported by Guest, Bunce & Johnson (2006), who argue that saturation of information gathered through interviews occurs within the first twelve interviews, although the basic elements of the findings could be present as early as six interviews. Along the same line, Creswell (2005) recommends that for a research study looking to identify themes, between five and twenty-five interviews would be required. Based on the views offered by Creswell (2005), Gall et al (2003), Guest et al (2006) and Patton (2002), a total of eight interviews were conducted with professionals from the digital marketing, application and digital publishing, online communications, and graphic design sectors, which represented a small cross-section of micro businesses in the digital content industry in the Brisbane area.

Recruitment

The data collection for the interview phase of the study was conducted over a two month period in April and May 2012. In sourcing the businesses and the interviewees for this phase of the study the researcher conducted an online search of AIMIA’s list of 440 SMEs and sole traders. A total of 33 micro businesses operating in the digital content industry were identified. The email addresses were sourced through the online Yellow Pages listing and an approach email was prepared by the researcher (see Appendix 6), to the business owner/manager, that outlined the aim of this phase of the study. An interviewee participant information sheet (see Appendix 7) was attached to the recruitment email. The information
sheet was designed and based on recommendations that it should provide a background to the study and the reason for the interview phase (Sarantakos, 2005). In order to neutralise any doubt or mistrust the interviewees may have had about the study, and to alleviate any concerns of anonymity, confidentiality and issues related to ethics, the information sheet also discussed the need for all interviewees who agreed to participate to sign a consent form prior to the interview being conducted. A total of twelve responses were received stating they would be prepared to participate in the interviews. However, due to time constraints and scheduling conflicts of some of the potential interviewees, and through the use of a convenience sample, eight interviews were conducted with professionals from the online marketing, applications development, digital publishing, graphic design, and games sectors only.

Data analysis

The key characteristic of qualitative data analysis is that it deals with the data presented in words and aims to interpret the data in a scholarly manner (Bryman, 2008; Sarantakos, 2005). The process of analysis is focused on the gathered data, reading it in relation to the context of the setting and the research problem, as well as applying a descriptive content analysis approach. Glesne (2006) argues that interview data analysis involves working with the data that has been collected, developing theories, categorising, synthesising, searching for patterns and interpreting the data that has been collected.

The data analysis was conducted from each individual interview transcript by identifying emerging themes, key words, and issues related to the research questions, the survey findings, and linking them back to the literature. The researcher determined that the approach of thematic analysis was best suited to this phase of the study as it was not constrained by pre-existing themes or categories. It also allowed for the management of a
large amount of transcript data in order to better understand aspects central to the research questions.

In describing the process of reducing the transcript data into meaningful groupings, Grbich (2007) suggests using a block and file approach, as this approach can keep large portions of data intact and allows the data, and indeed the interviewees, to “speak for themselves” (p.32), without any pre-designed themes being imposed. In discussing her approach to thematic analysis, Grbich (2007) describes a process by which portions of the transcript data is highlighted, grouped and placed in a table with headings to categorize the key words or themes in each column.

The first step of the analysis of the interview data was the transcription of the interviews. Transcription involved transcribing the digitally recorded interviews verbatim as well as taking into account the researcher’s interview notes for each interviewee. In qualitative research, the quality of field notes and transcripts of the recorded interviews is a crucial step (Cohen et al, 2005). Cohen et al (2005) argue for verbatim accounts of the interviewee and the context of the interview to make no attempt to adjust grammar or syntax. Following the transcription of the interviews, key words and phrases were grouped into two meta-categories aligned to the research questions in this phase of the study: the skills requirements for industry professionals, and skill and professional development approaches of the interviewees. The interview responses were categorized into similar groupings, which were developed using the definitions and descriptions from the literature review on generic skills (see Eraut, 2004; Mumford et al, 1999; NCVER, 2003) and the various 21st century skills frameworks proposed by Binkley et al (2010), EnGauge (2003), ITSE (2007), Jenkins et al (2006) and P21 (2006).

The process of identifying themes, key words and topics, and sorting them into different categories, is related to the generated data, or it may be constructed by the
researcher Burns, 2000; Grbich, 2007). In this case, this phase of the study was aimed at partially addressing all four research questions that were focused on how informal learning contributed to the skill and professional development of digital content professionals. The themes, issues, topics and responses from the interviews were related to the four research questions, and also reflected professional development and career learning approaches identified by a number of writers in the literature review, such as Billett (2001, 2002, 2004); Cheetham & Chivers (2001), Eraut (2004), Forfas (2007), Pickard (2007), Poell et al (2000), Reiter-Palmon et al (2006), Tak (2008), and Van der Krogt (1998).

Network mapping diagrams

One of the key outcomes of this phase of the study was to document and analyse the role and function of informal learning networks. In developing a valid set of network mapping variables, several network mapping approaches were accessed (see Conway & Steward, 1998; Haythornthwaite, 2000; Hogan, Carrasco & Wellman, 2007; Van der Gaag & Webber, 2008) and a combination of approaches were developed that best suited the aims and intended outcomes to best illustrate the informal learning networks of the interviewees in this study.

Conway & Steward (1998) discuss one of the most relevant and applicable set of network mapping variables. They outline various components that aid in mapping gathered data and highlight three main components of the network: “actors, links and flows” (p.231). In describing their views on the components for network mapping, Conway & Steward (1998) identify the individual (or actor) as being the most basic fundamental unit of identification, and argue that attention should be paid to the relationship of individual ties. In terms of links, or ties, between individuals, Conway & Steward (1998) discuss several factors that are crucial in better understanding the network: relationship type, intensity and reciprocity. They describe relationship type in terms of the nature of the tie, or bond, that
maintains the relationship between individuals. In citing Kanter (1972), they note three types of ties that could exist: between communities or networks, business related ties, and personal or friendship bonds.

Conway & Steward (1998) also describe the intensity of the bond or tie as being directly related to tie strength in terms of the frequency of the interaction between individuals in the network. They suggest tie strength could be illustrated by using varying thickness of lines in the network diagram to denote low, medium or high intensity ties. To aid in better visualising the strength of ties within an individual’s network, Haythornthwaite (2000) suggests weak ties as being interactions that occur monthly, or over longer periods of time; intermediate ties she denotes as being weekly interactions; and strong ties she defines as being daily communications. For the purposes of illustrating the learning networks of the interviewees in this phase of the study, a hybrid approach of the Conway & Steward (1998) tie intensity classification and Haythornthwaite’s (2000) number of interactions approach was used. Low intensity interactions were defined as being more than monthly or ad-hoc, medium intensity interactions were defined as weekly, and high intensity interactions were defined as being daily.

Conway & Steward (1998) also discuss the idea of reciprocity. They describe it as the flow of information between individuals through a given link within the network, this being either one-way or both-ways, and can be identified by arrows to denote the direction of the information flow. The final component identified by Conway & Steward (1998) in their approach to network mapping is that of transaction content. In this they refer to the content of information that flows between the individuals within a network. They describe an approach where symbols are used to identify the information shared within the network, or to identify people or organisations within the network.
It is worthwhile noting at this point that the network mapping tool developed for this phase of the study was predominantly based on the recommendations and considerations offered by Conway & Steward (1998) and Haythornthwaite (2000). One of the basic tenets raised by Conway & Steward (1998) in their process for network mapping was the notion of developing a graphic convention for representing the data collected for a given network. They offer several considerations to aid in the visual representation: (1) develop a template on one page that depicts individuals and/or information in quadrants; (2) adopt different symbols to depict people and/or information; (3) develop a set of graphics to outline elements, such as intensity of the relationship, direction of information flow, the information shared, and the people or organisations in the network. However, several other factors were also taken into account in finalising the network mapping tool, namely: identifying the people in the interviewee’s network and over what length of time measurement would be made.

In order to be able to better document the interviewee’s learning networks, it was identified that an approach called “name generators” (Hogan et al, 2007, p.118) be used as part of the data collection process. Hogan et al (2007) suggest that the method of name generation can be approached through the process of free recall, where the interviewee is asked to name people they have interacted with within a given time period. Hogan et al (2007) argue this approach in interview-based data collection for network diagrams helps to greatly reduce problems with data integrity and to reduce interviewee burden, while also using a low-technology (i.e. – paper) approach when interviewing. This approach was reinforced by Van der Gaag & Webber (2008) who suggest that name generators are the oldest measurement tool for individual social network research, which goes back to the 1970s and was the main method of social network data collection into the 1990s, and is still a “staple instrument for studies of social network structure” (p.38).
In determining over what period the interviewee’s learning network would be measured, several sources were identified, but no single time-period was identified as a standard for measurement of networks. Hogan et al (2007) and Van der Gaag & Webber (2008) both use timeframes of one week in their studies of data collection for social networks, while Skerlavaj et al (2008) used a one month timeframe for documenting the people in the learning networks in their study. Other researchers use longer timeframes in their studies in the course of documenting social networks, for instance in describing approaches to qualitative data collection, Patton (2002) suggests a six month window for measurement, which is supported by de Miguel, Luken, & Tranmer (2010) who also used a six month window for measurement of personal support networks. McCarty, Molina, Aguilar, & Rota (2007), in their personal network visualisation case studies, use a two year period for measurement of the respective networks. However, it should be noted that the study conducted by McCarty et al (2007) was conducted with interviewees in several countries in Europe and Africa. In other literature and research studies that were scanned in the course of developing an effective network mapping tool (such as Bessant & Tsekouras, 2001; Conway & Steward, 1998; Dirksen et al, 2010; Van der Gaag & Snijders, 2005), no time frames was discussed or identified. Given the intention of this phase of the study was to determine and document the informal learning networks of the interviewees, it was determined to use a one month time frame, using the free recall method in order to generate the widest possible list and names of individuals within their respective networks.

*Network mapping templates*

Given the variety of approaches and suggestions, it was determined that two network diagram templates be developed and used to best represent each of the interviewees’ learning networks. Each network mapping had a different focus in order to provide the most comprehensive visual depiction of the individual networks. The first network diagram
template focused on the information that was shared within an individual’s network, by using symbols to show who they interacted with, lines of varying thickness to depict the intensity of the relationship, and what method was used to interact with that individual or group. The second network diagram template focused on the relationship an individual had with people or groups within their network and used symbols to show the information exchanged, as well as lines of varying thickness to denote the level of intensity and the method of interaction. In developing the network mapping templates, the final element that was considered was how to depict the intensity of the relationship.

In determining how best to depict the intensity of the relationship, or strength of a tie, it was felt the descriptions offered by Conway & Steward (1998) and Haythornthwaite (2000) provided the best indication of terminology and intensity of relationship, and that a combination of the two approaches be used. To this end, the following approach was developed: low – monthly or longer interaction/s; medium – one to two times per week; and high – daily communication. Finally, it should be noted that the flow of information within the network was denoted by the use of arrows. A summary of the network mapping variables are shown below in Figures 2 and 3.

![Figure 2: Network mapping variables for information-based diagram](image)

![Figure 3: Network mapping variables for relationship-based diagram](image)
The interviewees’ network diagrams were documented based on the responses gathered from the interviews, then transferred and coded into Microsoft PowerPoint using the variables described earlier. The two network mapping templates used for this part of the study is provided below in Figures 4 and 5.

<table>
<thead>
<tr>
<th>Business management</th>
<th>Networking with others</th>
<th>Programming and software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry and future trends</td>
<td>Interviewee</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>Technology</td>
<td>Online games and production</td>
</tr>
</tbody>
</table>

*Figure 4: Information-based network template*
<table>
<thead>
<tr>
<th>Work colleague/s</th>
<th>Industry peers</th>
<th>Competitor/s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seminar and conferences</td>
<td></td>
<td>Client/s</td>
</tr>
<tr>
<td></td>
<td>Interviewee</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional association/s</td>
<td>Educational institution</td>
<td>Friends</td>
</tr>
</tbody>
</table>

**Figure 5: Relationship-based focused network template**

**Research Ethics**

Prior to collecting the data for this study, two low risk ethics applications were submitted to the Queensland University of Technology (QUT) University Human Research Ethics Committee (UHREC). Phase one (an online survey) and phase two (semi-structured interviews) were granted ethical clearance under QUT reference numbers 1100000102 (see Appendix 8) and 1200000121 (see Appendix 9) respectively.

According to the National Statement on Ethical Conduct in Research Involving Humans, which is highlighted by the use of interview, surveys, questionnaires and focus groups, or where the level of discomfort to the person can easily be managed, a research study is deemed to be low risk. Given the nature of the intended approach (mixed method), utilising an online survey and interviews to collect background information, skill
requirements and approaches to skill and professional development, the risks relating to the businesses and the individuals involved in this study were considered low.

Sarantakos (2005) provides a comprehensive framework identifying nine key ethical issues within research projects: explaining the purpose, risk assessment, confidentiality and privacy, informed consent, data access and ownership, data collection, advice, mental harm, and research approvals through ethics committees. Creswell (2005), Gall et al (2003) and Sarantakos (2005) all agree that the cover letter is a key component to the research study, one that will greatly assist in providing a positive view of the study as well covering the principles of ethics in research. A covering letter accompanied the research instruments (the online survey and interview question schedule). It provided details about the focus of the study, participation, ethics, expected benefits and confidentiality.

The purpose of the research was clearly explained to both the business owner/manager and the individuals within the study. The researcher made it clear that some identification of the participants may need to occur but that confidentiality would be ensured. Every person involved in the study was offered the opportunity to receive a copy of the final report of the study.

Invitation to participate

Participation in both phases of this study was voluntary and was managed in two ways, which aligned with the two research methods to be undertaken in this study: an online survey and interviews.

The recruitment approach for the survey phase of this study was described previously in the recruitment section of the survey phase. For the interview phase of the study, an approach email and an accompanying information sheet was sent to individuals and business owner/managers of micro businesses inviting them to participate in the study and requesting an opportunity to interview a selection of their staff.
Consent

Consent and permission was sought in different ways prior to the study being initiated and commenced. For potential survey respondents, an approach email was sent to each individual asking them to participate in the survey phase of the study. This email also included a link to the online survey as well as a link to the participant information sheet. The completion or partial completion of the online survey was accepted as an indication of their consent to participate in the survey phase of the study. Additionally, supplying an individual email address was an opt-in question at the end of the survey for those participants who chose to enter the gift card draw or to receive a copy of the survey findings; they were not attached to the survey results. The survey findings are presented in an aggregate form; no individual participant is identifiable.

Consent for the interview phase of this study was managed through informed consent. Initially, an approach email and information sheet was sent to the business owner/manager seeking their agreement and requesting an opportunity to interview a selection of their staff. The information sheet provided details about the focus of the study, ethics, expected benefits and confidentiality. Each interviewee that agreed to participate was asked to respond to the email request and was issued a consent form at the time of the interview, which they were required to sign to confirm their agreement to participate (see Appendix 10). As the interview phase of the study involved audio recording, the following arrangements were put in place and confirmed with the interviewees to ensure the proper management of information:

- the interviewee had the opportunity to verify their comments and responses prior to final inclusion;
- the audio recordings were not used for any other purpose (e.g. as an instructional aide); and
- the audio recordings were only accessible by the researcher.
Summary

The broad intent of this research study is to explore how informal learning via social networks contributes to skill and professional development of digital content workers. The overall intent of this research study is to describe the approaches undertaken by digital content workers in their skills and professional development, and to investigate how informal learning networks operate.

This chapter has provided an overview of the research approach and the methods used to enable the collection and analysis of data capable of answering the research questions. An overview, along with an explanation and description of the mixed method approach to research that is envisioned for this study was also provided. In describing and outlining the two data collection methods - an online survey and interviews - explanations were provided of online surveys, the use and development of the survey, the development and approach to conducting the semi-structured interviews, as well as the consideration of sampling. Integral to this discussion was the consideration of triangulation, through the use of various methods of data collection to improve validity and provide greater depth to the study. Finally, the ethical elements of the study, in particular consent and participation, was considered and discussed. The next chapter provides the data and the findings from the survey phase of this research study.
Chapter 4

Survey data and results

Introduction

This chapter reports on the survey data and findings. The first section provides the background information and demographics of the respondents, while the second section of this chapter focuses on formal and informal learning, the professional development approaches taken by the respondents and the skills needed in the industry as reported by the survey respondents. The intention of the survey phase of this study was to partially address two research questions: identify the key skill and professional development requirements of digital content professionals in micro businesses, and what approaches they had undertaken for their ongoing skill and professional development.

Response Rate

Calculating the response rate for an online survey is challenging given the email approaches described earlier and the widespread nature of the internet. Kaye & Johnson (1999) argue that the response rate of an online survey cannot be calculated because there is no real way in which to know how many individuals might have seen the survey or its links but declined to participate. However, what can be ascertained is the number of completed and incomplete surveys, as well the number of times a site has been accessed.

At the close of the survey period (close of business 6 May 2011), 198 completed surveys and 32 incomplete surveys were received, with a total of 546 survey page visits. A total of 184 completed surveys and 32 partially completed surveys were received out of the 1097 emails sent in stage 3 of the recruitment campaign. Of the completed surveys, 14 respondents answered No to the survey eligibility question. An indicative response rate for the survey would be approximately 17%.
Demographics

Section 1 of the survey gathered data about the background of respondents. The details are presented in this section in order to provide an overview of the individuals who responded to this survey. To gain a better understanding of the background and current work environment of the respondents, data was gathered on their current occupation within the industry (see Table 40 at Appendix 12), the purpose of the business where they are currently employed, as well as their age and gender. The largest group of respondents, 34.8% (n=64), fell within the age bracket of 30 to 39 years of age (see Table 16 below).

Table 16: Age of the respondents

<table>
<thead>
<tr>
<th>Age group</th>
<th>Percent (n=184)</th>
</tr>
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<tbody>
<tr>
<td>20 to 29</td>
<td>28.8</td>
</tr>
<tr>
<td>30 to 39</td>
<td>34.8</td>
</tr>
<tr>
<td>40 to 49</td>
<td>22.3</td>
</tr>
<tr>
<td>50 to 59</td>
<td>10.9</td>
</tr>
<tr>
<td>60+</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results also showed the largest number of respondents were from developers (n=14, 7.6%), designers (n=11, 6.0%), ICT professionals (n=11, 6.0%), and managers (n=11, 6.0%). The survey did garner responses from a cross-section of occupations working in the digital content industry. To further understand those individuals who responded to the survey, data was gathered on which sector in the digital content industry they represented. The design (n=28, 15.2%), and video (n=25, 13.6%) sectors represented the two largest groups of respondents to the survey, while the animation and communications/marketing sectors (n=21, 11.4%) were the next most represented sectors in the survey. Of particular note, the least represented sectors were audio services (n=8, 4.3%), web hosting (n=6, 3.3%) and e-
commerce (n=6, 3.3%). Figure 6 below presents a composition of the respondents from within the digital content industry sectors.

![Business purpose (n=184)](image)

**Figure 6: Respondents by digital content sector**

**Formal education and training**

The intention of this question was to provide an indication of where within the learning and education framework respondents had engaged in and completed forms of formal education during their career. From the literature it was suggested that individuals would utilise the learning affordances offered by formal learning as one approach to developing their specialist skill sets, so this data was gathered to further understand the group of respondents’ level of formal learning affordances. The literature highlights the lack of skill and capability within the digital content industry (CIE, 2005). AIMIA (2005) reports that a quarter of the digital content sector businesses have difficulty getting staff, and there is a lack of skills and experience, particularly in the creative and management areas.
Over 94% of the respondents held some form of qualification, over 17% (n=32) of respondents were at least Certificate qualified, a further 36% (n=66) were degree qualified (see Table 17 below). Of further note, 12% (n=22) of respondents held some form of post graduate qualification (either a Graduate Certificate or Graduate Diploma), and 10% (n=18) held either a Masters or PhD degree. Of particular note, almost 60% of respondents (n=110) reported that they held at least two qualifications, 5% (n=10) reported they held four qualifications, and 6% (n=11) held no formal qualification of any kind. A breakdown of formal education and training by field of study, creative industries area and digital content sector can be found in Tables 41, 42, and 43 at Appendix 12.

Data was collected on the field of study in which formal education was undertaken. The results show an overwhelming majority of respondents (88%, n=162) held some form of qualification in the creative industries area, and 35% of respondents (n=65) held some form of qualification in Information and Communications Technology (ICT) and Management and Commerce respectively. Of note, 14 respondents (4.3%) held some form of qualification in an engineering field (see Table 41 at Appendix 12). In relation to those who held a creative industries qualification, the majority of respondents (33%, n=61) were from the Film, TV and Radio area within the creative industries. Analysis of this data also showed that within the entire group of respondents 26% (n=48) and 20% (n=37) of qualifications were undertaken in the areas of Software and Interactive Content, and Arts, Crafts and Design respectively. Of particular interest to this study, 88% of respondents (n=162) held some form of qualification related to the digital content industry. Those respondents who held a qualification in the digital content industry was in the Film, and TV production sector (63%, n=57), while 16% (n=30) and 13% (n=25) industry qualified respondents held qualifications within the Content Development and Online and Interactive Games sectors respectively (see Table 43 at Appendix 12).
### Table 17: Qualifications summary

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Percent (n=184)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>6.0</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>17.3</td>
</tr>
<tr>
<td>Diploma/Advanced Diploma</td>
<td>19.0</td>
</tr>
<tr>
<td>Undergraduate/Bachelor degree</td>
<td>35.8</td>
</tr>
<tr>
<td>Postgraduate Certificate/Diploma</td>
<td>12.0</td>
</tr>
<tr>
<td>Masters degree</td>
<td>8.7</td>
</tr>
<tr>
<td>PhD</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Career path**

This question was aimed at understanding the level of experience within the digital content industry and the career path of respondents. Data was collected on the number of years they were employed at a business, the number of employees at the business, and the basis of their employment.

In the case of years of experience in the industry, the data showed that almost 50% of respondents (n=90) had between one and ten years experience in the digital content industry, which may reflect a large number of respondents who might be categorised as having substantial levels of life experience, if not in the digital content industry, in other industry sectors (see Table 18 below). This result may also reflect the way work is organised in the industry, as CIE (2005) reports: “in many of the smaller firms, teams of workers are often assembled on a project-by-project basis, such as in the production of motion pictures” (p.16). The positive skewness (0.365) result for years of experience indicates relatively few high values, which is reflected in the number of responses for less than 12 months and 20 plus years. The negative result for kurtosis in the measure of probability distribution (-0.766) for
years of experience indicates a relatively flatter distribution for this variable (Hair et al, 2006).

**Table 18: Years of experience of respondents**

<table>
<thead>
<tr>
<th>Years of experience</th>
<th>Percent (n=184)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 12 months</td>
<td>11.4</td>
</tr>
<tr>
<td>1 to 5 years</td>
<td>25.5</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>23.5</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>19.6</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>9.8</td>
</tr>
<tr>
<td>20+</td>
<td>10.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The results also show that a vast majority of respondents (76.6%, n=141) had held two positions in the industry, 46.7% (n=86) held three positions, and almost 60% of respondents (n=110) had been employed in the industry for between 3 and 4 years, principally working in either a micro business (5 or less employees) or a small business (between 6 and 25 employees). All of the respondents (100%, n=184) were currently, or had been, employed on a full-time basis. Of particular note, casual, freelance, self-employed and project-based work were the least favoured approaches to being employed in the industry, accounting for 30% (n=56) of respondents (see Tables 44, 45, and 46 at Appendix 12).

Data was gathered to understand the respondent’s level of experience in their current occupation and whether the respondents had worked in similar occupations in other industries, and what, if any, non-digital content type occupations they had held in other industries. This is shown below in Tables 19 and 20. A complete list of occupations in other industries and non-digital content type roles can be found in Tables 47 and 48 at Appendix 12.
**Table 19: Other industries and digital content industry occupations**

<table>
<thead>
<tr>
<th>Other industries</th>
<th>Percent (n=106)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building and construction</td>
<td>4.7</td>
</tr>
<tr>
<td>Education</td>
<td>12.3</td>
</tr>
<tr>
<td>Environment</td>
<td>2.8</td>
</tr>
<tr>
<td>Finance</td>
<td>1.9</td>
</tr>
<tr>
<td>Food and hospitality</td>
<td>4.7</td>
</tr>
<tr>
<td>Health</td>
<td>9.4</td>
</tr>
<tr>
<td>ICT</td>
<td>20.8</td>
</tr>
<tr>
<td>Management</td>
<td>4.7</td>
</tr>
<tr>
<td>Oil, mining and gas</td>
<td>3.8</td>
</tr>
<tr>
<td>Science</td>
<td>5.7</td>
</tr>
<tr>
<td>Society</td>
<td>16.0</td>
</tr>
<tr>
<td>Tourism</td>
<td>11.3</td>
</tr>
<tr>
<td>Other</td>
<td>1.9</td>
</tr>
<tr>
<td>Not applicable</td>
<td>73.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
Table 20: Other industries and non-digital content industry occupations

<table>
<thead>
<tr>
<th>Other industries</th>
<th>Percent (n=128)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0.8</td>
</tr>
<tr>
<td>Building and construction</td>
<td>1.6</td>
</tr>
<tr>
<td>Education</td>
<td>15.6</td>
</tr>
<tr>
<td>Environment</td>
<td>2.3</td>
</tr>
<tr>
<td>Finance</td>
<td>1.6</td>
</tr>
<tr>
<td>Food and hospitality</td>
<td>2.3</td>
</tr>
<tr>
<td>Health</td>
<td>3.9</td>
</tr>
<tr>
<td>ICT</td>
<td>14.8</td>
</tr>
<tr>
<td>Management</td>
<td>8.6</td>
</tr>
<tr>
<td>Oil, mining and gas</td>
<td>5.5</td>
</tr>
<tr>
<td>Science</td>
<td>7.0</td>
</tr>
<tr>
<td>Society</td>
<td>10.9</td>
</tr>
<tr>
<td>Tourism</td>
<td>9.4</td>
</tr>
<tr>
<td>Other</td>
<td>15.6</td>
</tr>
<tr>
<td>Not applicable</td>
<td>30.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

In summary, the previous section provided an overview and description of the respondents to the survey. It was reported that the majority of respondents were aged between 30 and 39 years of age and represented all sectors of the digital content industry, predominantly from the design and video sectors. It also reported on what, if any, forms of formal education the respondents had undertaken during their careers. The vast majority of respondents held at least one formal qualification, of which the majority were Certificate qualified and, overwhelmingly, within the creative industries area. Finally, it was identified that half the respondents had between one and ten years experience in the industry, had held several positions within the industry, predominantly on a full-time basis. The next section focuses on the respondents’ approach to skill and professional development.
Learning, Skills and Professional development

Section 2 of the survey focused on three broad themes, principles and practices that were identified and documented in the literature review surrounding formal and informal learning, skills needed in the industry, and professional development approaches. The questions in this section were focused on partially addressing research questions one and two: to identify the skill and professional development learning needs of digital content workers in micro businesses, and what approaches professionals in the industry undertake for their skill and professional development.

Skills needed in the industry

In relation to identifying the key skills needed, three questions were posed in the survey requesting information on: (1) the skills needed by professionals working in the industry; (2) the key skills the respondents saw as being important to them at the moment; and (3) the key skills they saw as being relevant to them in the next 3 to 5 years. Respondents were given the opportunity to provide up to five responses to each question. The use of the Key Survey software allowed for the data to be collected electronically and downloaded into an Excel spreadsheet. The three skills-related questions were open-ended questions that allowed the respondents to write their responses. The responses were categorised into similar groupings and were coded as numerical variables that were developed using the definitions and descriptions predominantly based on Eraut’s (2004) list of workplace skills, Mumford, Peterson & Childs’ (1999) Occupational Information Network (ONET) skill list, and the National Centre for Vocational Educational Research (NCVER, 2003) generic skills listing. The verbatim responses were retained in an Excel data file for future reference.

Several factors were taken into account in deciding to use these skill lists in coding. As was argued in the literature review, there was not one comprehensive list that suitably covered the various occupations in the industry. What was identified were a generic skill sets
and taxonomies “which require workers to have these skills in jobs which require flexibility, initiative and the ability to undertake many different tasks” (NCVER, 2003, p.16). In reviewing the generic skill sets and taxonomies offered by Eraut (2004), NCVER (2003) and Mumford et al (1999) recognise the importance of generic skills associated with an individual’s professional development and career path, possessing a broad range skills is important for an industry professional, provide a link between broad and general skills and specific occupational skills, and align the skills to the work context in terms of their skill and professional learning requirements.

Table 21 below shows that just over 56% of the total responses provided the most frequent responses for the most important skills for professionals in industry: business management, communication, technical ability, networking with others, creativity, and project management. This result would seem to indicate that in terms of skills needed by people working in the industry, the respondents felt that a mix of both business and technical acumen was important.

At this point it is worth noting how the different skill lists and taxonomies described what was coded from the survey responses for business management, communication, technical skills and creativity. Business management garnered the most responses (11.9%, N=90) and was identified as being the most important skill required by industry professionals. In terms of business management, the various taxonomies and skill lists identified the function of business management in different ways. For instance, Eraut (2004) lists elements of business management in what he calls role performance, which includes such skills as delegation, supervision, leadership and prioritisation. In their generic skills list, NCVER (2003) describe these activities as planning and organising, which includes managing time and priorities, and resource management. While Mumford et al (1999), in their skill list, categorise business management under generic and cross-functional skills,
which includes resource management, personnel management, time management and decision-making. In coding the responses, it was identified that business management type skills were indeed reported using a variety of terms in the survey. It was determined that these responses would be best coded as business management. A sample of some of the verbatim responses from the survey which were coded in this category include “time and management skills” (ID022), “business acumen” (ID047), “managing competing priorities” (ID053), “problem-solving and ability to identify solutions” (ID078), “leadership ability” (ID127), and “business courses relevant to dealing with employers ever changing business ethics” (ID152).

NCVER (2003) note that communication skills are about communicating ideas and information, reading and interpreting documents, and writing for a specific audience. Mumford et al (1999) identify communication skills, included reading, writing and oral skills, while Eraut (2004) asserts that communicating with a wide range of people is a required skill as part of a person’s task performance. Based on these definitions, the findings show that 11.0% (N=83) of responses related to the importance of communication skills for industry professionals. A sample of the verbatim responses provided by the respondents that were coded in the category of communication skills included “business communications” (ID018), “writing and presentation skills” (ID042), “effective communication processes” (ID053), whilst many others wrote “communication skills” (for example ID005, ID010, ID022, ID030, ID0041, ID058, and ID090).

In terms of technical and technological skills, NCVER (2003) describe this as the ability to use technology as part of a person’s work function, using information technology (IT) to organise data, and applying IT as a management tool. Mumford et al (1999), in their skill set, contend that technical skills typically include skills such as testing, troubleshooting, repairing equipment, and system operations. The respondents identified technical ability
(9.8%, N=68 of responses) as one of the most important skills needed in the industry. The respondents provided a variety of responses in terms of their technical or technological skills. A sample of the verbatim responses included “basic technical background e.g. - HTML and web technologies” (ID003), “ability to understand technical aspects” (ID018), “technical competency development in a specific platform” (ID030), “technical fit with client requirements” (ID107), and other respondents wrote “technical skills” (such as ID022, ID035, ID054, ID082, ID116).

Creativity was identified (see Caves, 2000; Howkins, 2001) as being a core skill requirement, and not just in the broader creative industries; it was also quite clearly identified as a core skill required for those working in the digital content industry (AIMIA, 2005; CIE, 2005). At a broader skill and competency level, the skill list and taxonomies (such as Forfas, 2007; Mumford et al, 1999; NCVER, 2003) identify elements of creativity as a skill requirement. In their summary of future skills requirements, Forfas (2007), through a consolidation and review of a number of competencies and skills frameworks from around the world, identifies, amongst other skills, the need to think creatively and to engage with innovation. NCVER (2003), in their list of generic skills, call it initiative and enterprise, which comprises such activities as being creative, developing innovative outcomes and translating ideas into action. Mumford et al (1999), in their section on generic skills, identify such elements as idea generation, solution planning and idea evaluation, which relate to creativity. In scanning and coding the responses to this skill question, it was found that 6.9% (N=52) of respondents identified elements of creativity and innovation as being an important industry skill. Given that creativity has been identified as an important skill requirement within the industry, it was decided that creativity be coded as a variable for these type of responses. In the process of coding these responses, a range of skills were reported that included the following sample of verbatim responses: “digital innovation” (ID032 and
ID063), “idea creation” (ID112), “idea development” (ID159), whilst many others simply wrote “creativity” (for example ID017, ID055, ID070, ID084, ID092, ID117, ID129, and ID168).

**Table 21: Most important industry skills**

<table>
<thead>
<tr>
<th>Most important industry skills</th>
<th>Percent (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N=754, Number of responses)</td>
<td></td>
</tr>
<tr>
<td>Business management</td>
<td>11.9</td>
</tr>
<tr>
<td>Communication</td>
<td>11.0</td>
</tr>
<tr>
<td>Technical ability</td>
<td>9.8</td>
</tr>
<tr>
<td>Networking with others</td>
<td>9.7</td>
</tr>
<tr>
<td>Creativity</td>
<td>6.9</td>
</tr>
<tr>
<td>Project management</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>56.2</td>
</tr>
</tbody>
</table>

Respondents were then asked to indicate what they saw as being their important skill and professional development requirements at the time of completing the survey. The most frequent responses were recorded in four skill areas: business management, new trends in the industry, software knowledge, and technical ability. Table 22 below shows that over 20% of the responses to this question were reflected in the four categories. For this question, some of the responses included “understanding emerging trends in social media” (ID015), “understanding of programming and web languages such as CSS3, HTML, SQL, and JQuery” (ID094), “keeping up to date with industry changes” (ID017 and ID024), and “further development and training in the field I am in, by people who are actually skilled in said field” (ID152).

It is worthwhile noting that the responses for software knowledge were coded in a way that encompassed a number of different responses related to such factors as programming languages, particular software descriptions, and web and internet development protocols. By way of defining software skills, Reiter-Palmon, Young, Strange, Manning &
James (2006) suggest that they could be described as “occupationally-specific skills” (p.358). These skills, they suggest, can be tied to an occupation or a set of occupations (such as a job family), can cut across other jobs and industries, and are the type of skills that can be utilised across jobs when jobs include similar occupationally-specific skills. A sample of the verbatim responses that were coded as software knowledge included “CSS, HTML, and image editing” (ID008), “using different software” (ID044), “software competency” (ID090), “adobe software suite skills” (ID122), “advanced software skills” (ID163), “better software language skills such as HTML and CSS etc” (ID168).

**Table 22: Most important skills for respondents**

<table>
<thead>
<tr>
<th>Most important skills for respondents</th>
<th>Percent (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software knowledge</td>
<td>5.6</td>
</tr>
<tr>
<td>Technical ability</td>
<td>5.5</td>
</tr>
<tr>
<td>New trends</td>
<td>5.1</td>
</tr>
<tr>
<td>Business management</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21.1</strong></td>
</tr>
</tbody>
</table>

In relation to the final skills-related question, the respondents were asked to identify what they saw as being their most important future skill and their professional requirements in the next 3 to 5 years. The intention of this question was to provide an indication of the type of skills and professional development requirements the respondents saw for themselves as part of their future within the industry, and in some way show whether the respondents had considered the idea of ongoing skill and professional development in relation to their occupation and in maintaining currency within the industry. The results (see Table 23 below) showed that almost 50% of the responses to this question were in five areas, significantly in business management and technical ability, which were identified by respondents as being key skill and professional development areas in the previous two questions (industry and
personal skills respectively). It can also be noted from the cross-tabulation that the most frequent number of responses to this question came from respondents with 1 to 10 years of experience (N=84) with new trends (N=29) being their most frequent response. Interestingly, the respondents with 10 or more years experience felt that business management (N=19) was their most important future skill need. Some verbatim examples of responses provided by the respondents included “understanding of new and emerging technologies in Australia such as augmented reality” (ID002, ID022, and ID024), “business planning and management” (ID003, ID104, ID108, and ID122), “creating speed to market content for new devices as and when they occur (e.g. - tablets, mobiles etc)” (ID015), and “technical and technology skills” (ID093 and ID114).

Table 23: Most important future skills for respondents

<table>
<thead>
<tr>
<th>Most important future skills</th>
<th>Percent (N) (N=366) Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>New trends</td>
<td>14.5</td>
</tr>
<tr>
<td>Business management</td>
<td>9.6</td>
</tr>
<tr>
<td>Digital and content media</td>
<td>9.3</td>
</tr>
<tr>
<td>Technical ability</td>
<td>8.2</td>
</tr>
<tr>
<td>Software knowledge</td>
<td>7.9</td>
</tr>
<tr>
<td>Total</td>
<td>49.5</td>
</tr>
</tbody>
</table>

From the results outlined above, the question could be raised as to whether there is any significance in the responses between the three skills-related questions, whether there were any significant characteristics. To further analyse these results and address this question, cross-tabulations were conducted between the most important industry skills, the individual’s most important skills, and their most important future skills, against the years of experience, gender and occupation of the respondents (see Tables 49 to 57 at Appendix 12).
In terms of the respondent’s years of experience, the cross-tabulation did not indicate any major differences for the industry skills question ($\chi^2 = 17.802$, df = 12, $p > 0.1$). However, by conducting individual chi square tests for each of the three reported skill and professional development areas, it was found that the responses for the most important industry skills, both business management ($\chi^2 = 9.453$, df = 4, $p < 0.05$) and communication ($\chi^2 = 9.962$, df = 4, $p < 0.05$), were significant. The significant difference is reflected in the results for those respondents with between one and ten years experience in the industry where communication (N=49) and business management (N=45) represented almost 13% of the total number of responses to this question. From the overall result it can be concluded that both business management and communication skills, regardless of years of experience in the industry, are seen by the respondents as being the most important skills required within the industry.

The results of the cross-tabulation with respect to gender indicated some significant differences. The chi square test of significance for industry skills ($\chi^2 = 18.914$, df = 7, $p < 0.05$) showed a difference in response pattern across male and female respondents (see Table 50 at Appendix 12). In particular, the individual chi square tests identified the difference was in two skill areas: business management ($\chi^2 = 8.070$, df = 2, $p < 0.05$) and technical ability ($\chi^2 = 8.826$, df = 2, $p < 0.05$). Males identified business management (N=52) and technical ability (N=49) as their most important industry skills, while females identified communication (N=40) and creativity (N=30) as their important industry skill areas. The results of the cross-tabulations for the other two skill questions did not indicate any major significant differences in terms of gender. To better understand this result, analysis was conducted on whether the respondents were distributed across the various occupations, or whether there was a gender split across the occupations. The analysis showed that the respondents were quite evenly distributed across the occupations, and no real gender trend
was identified by cross tabulation, shown in Table 67 at Appendix 12. For instance, one female respondent reported that she was employed as a “content writer and manager” (ID003), another identified herself as a “project director” (ID018), while several male respondents reported at the time of the survey that they were employed as a “digital artist” (ID055) and another was a “copyright officer” (ID087). The chi square test of significance ($\chi^2 = 40.435$, df = 24, $p = 0.019$) showed a significant difference between gender and occupation, but this result has been discounted as the table contained cells with counts of less than five.

Another set of cross-tabulations was conducted in terms of the respondents’ occupation and the skills needed in the industry. As shown in Table 55 at Appendix 12, the most represented occupation groups in the survey were CEO, designer, developer, director, ICT professional, manager, and producer, which corresponded to 40.1% (n=74) of respondents to the survey. The results of these cross-tabulations with respect to the three skill questions showed one significant finding in terms of skills required to work in the industry. The chi square test of significance for industry skills in terms of the respondents’ occupations ($\chi^2 = 25.079$, df = 12, $p < 0.05$) showed some differences in response patterns and is reflected in the individual chi square analysis of the six most reported industry skills. The results for communication (N=36; $\chi^2 = 12.386$, df = 4, $p < 0.05$) and business management (N=34; $\chi^2 = 15.693$, df = 4, $p < 0.05$) would suggest that, regardless of occupation, the respondents felt these two skills were two of the most important needed to operate in the industry. With respect to the cross-tabulations for the other two skills questions (personal and future skills), when compared to occupation no major differences were identified (see Tables 56 and 57 at Appendix 12).

Finally, cross-tabulations and chi-square tests were conducted in terms of the most important industry skills, the respondents’ most important skills, and their future skill needs.
with respect to business purpose. One test showed as being significant. This was in relation to the most important industry skills. As was the case in the significance tests with gender and occupation, business management (N=103; \( \chi^2 = 33.531, \text{df} = 12, p < 0.05 \)) and communication (N=93; \( \chi^2 = 19.437, \text{df} = 12, p < 0.05 \)) yielded significant results. However, the cross-tabulations and chi-square tests related to the respondents’ personal and future skills showed no major significant differences in identifying the key development areas for personal and future skills. Of further note, in analysing the responses for the personal and future skills questions, business management (N=42 and N= 45, respectively) and new trends (N=55 and N=45, respectively) were the most frequently reported responses.

**Approaches to skill and professional development**

The literature identified that individuals working in the digital content industry would typically access two approaches as part of their skill and professional development: formal learning and informal learning. It was identified that formal education and training could be undertaken through university education, vocational education and training, externally provided short courses, and internally offered training opportunities (AIMIA, 2005; CIE, 2005; Eraut & Hirsch, 2007; Haukka, 2011). Alternatively, informal learning was described as learning that could occur in the workplace through interaction with others and could be represented by a range of strategies that include casual conversations, social interactions, team work and mentoring, and related to the work function (for example Billett, 2001, 2002, 2007; Dale & Bell, 1999; Eraut, 2000; and Marsick & Watkins, 1990).

The focus of this research question was to identify the approaches professionals in the industry have undertaken for their skill and professional development. Three survey questions were posed that specifically targeted the respondents’ approach to skill and professional development: education and training undertaken in the previous 12 months, the level of importance of a set of informal learning strategies, and what other informal learning

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strategies the respondents’ accessed. As was the case in analysing the skills identified by the respondents, the data for the question was imported into SPSS and the verbatim responses were then categorised into similar groupings and were coded as numerical variables.

Formal education and training

To better understand what, if any, formal education and training was undertaken by the respondents, a question was posed about what formal education and training they had undertaken in the previous 12 months. The results showed that 72.8% (n=134) had undertaken some form of formal education and training in the previous 12 months. Almost four in ten (n=68, 37%) had undertaken two formal education and training programs, and 5.4% (n=10) had taken three formal education and training programs. One respondent (0.5%) reported taking five formal education and training programs in the previous 12 month period.

The most frequent type of education and training program was a short course, which represented 34.7% (N=74) of the total responses to this question. The next most common education and training approach undertaken were a specialised vendor/product course (N=53, 24.9%) and a special event (i.e. – a conference, and networking sessions etc; N=44, 20.7%). It can also be reported that the most common duration for the education and training programs was between 2 and 10 days (N=118, 54.9%), whilst the longer programs (2 or more years in duration) accounted for 4.7% (N=10) of responses. It can be reported that TAFE and university courses accounted for 6.1% (N=13) of responses, which would be expected as these courses would typically operate over a longer period of time. Tables 24 and 25 below provide a summary of the type and duration of the formal education and training programs. Finally, it can be reported that in a majority of cases (N=92, 68.7%) the courses were funded by the employer, while self-funded courses accounted for 44.0% (N=59) of the responses (see Table 61 at Appendix 12).
Table 24: Type of education and training

<table>
<thead>
<tr>
<th>Type of education and training</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short course</td>
<td>34.7</td>
<td></td>
</tr>
<tr>
<td>Specialised product/vendor course</td>
<td>24.9</td>
<td></td>
</tr>
<tr>
<td>Special event</td>
<td>20.7</td>
<td></td>
</tr>
<tr>
<td>Organise learning support</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td>TAFE/private college</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2.3</td>
<td></td>
</tr>
</tbody>
</table>

Table 25: Duration of formal education and training

<table>
<thead>
<tr>
<th>Duration of education and training</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 10 days</td>
<td>54.9</td>
<td></td>
</tr>
<tr>
<td>One day</td>
<td>20.5</td>
<td></td>
</tr>
<tr>
<td>One semester</td>
<td>7.9</td>
<td></td>
</tr>
<tr>
<td>One year</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>One term</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>3+ years</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>2 years</td>
<td>1.4</td>
<td></td>
</tr>
</tbody>
</table>

Data was also collected into field/s in which the education and training was undertaken. The majority of being in the creative industries field, which accounted for 39.9% (N=69) of responses. This result indicates that of those respondents who did undertake some form of formal education, it was within an area of the creative industries sector, which includes the digital content industry (see Table 62 at Appendix 12). There were two other fields which represented a large proportion of the responses: information technology (N=46, 26.6%) and management and commerce (N=39, 22.5%). The following is a sample of responses provided by respondents “content development, and digital publishing” (ID014,
ID57, ID116, ID146), “online games, and visual arts” (ID047, ID122, ID132, ID140),
“information and communication technology” (ID033, ID050, ID061), and “business
management” (ID006, ID028, ID055, ID150). Tables 26 and 27 provide a summary of which
field the formal education and training was undertaken by the respondents, and a cross-

Table 26: Field of formal education and training

<table>
<thead>
<tr>
<th>Field</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative industries</td>
<td>31.0</td>
<td></td>
</tr>
<tr>
<td>Management and commerce</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td>Information technology</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td>Humanities</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Architecture and building</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>0.0</td>
<td></td>
</tr>
</tbody>
</table>
Of those who did undertake some form of formal education and training program, a total of 213 responses were recorded for the skills that particular program had intended to address. The analysis shows the three most frequent responses (see Table 63 at Appendix 12) to this question were technical skills (N=31, 14.6%), web development (N=30, 14.0%) and networking with others (N=22, 10.3%). Some of the skills reported by the respondents included “web and internet technologies, and media uses” (ID082 and ID083), “social media

Table 27: Cross-tabulation of field and duration of formal education and training

<table>
<thead>
<tr>
<th>N=213 responses</th>
<th>1 day</th>
<th>2 – 10 days</th>
<th>One term</th>
<th>One semester</th>
<th>1 year</th>
<th>2 years</th>
<th>3+ years</th>
<th>N Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative industries</td>
<td>14</td>
<td>39</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>66</td>
</tr>
<tr>
<td>Management and commerce</td>
<td>13</td>
<td>32</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>Information technology</td>
<td>10</td>
<td>30</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>57</td>
</tr>
<tr>
<td>Education</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Humanities</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Architecture and building</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Engineering</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Health</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>118</td>
<td>10</td>
<td>17</td>
<td>16</td>
<td>3</td>
<td>7</td>
<td>213</td>
</tr>
<tr>
<td>N Percent</td>
<td>20.5</td>
<td>54.9</td>
<td>4.7</td>
<td>7.9</td>
<td>7.4</td>
<td>1.4</td>
<td>3.3</td>
<td></td>
</tr>
</tbody>
</table>
marketing, SEO, content development, IPTV” (ID014 and ID034, and ID104), “industry trends and networking” (ID057, ID069, ID072, and ID082), and “certification in advanced software knowledge” (ID010, ID011, and ID127)

A set of cross-tabulations and chi-square tests were also conducted as to whether a relationship existed between the skills addressed by the education and training undertaken by the respondents and: (1) their most important skill and professional development requirements; and (2) the topics and information shared with the respondents’ business and social relationships.

The analysis and chi square tests showed that there was strong evidence to suggest a relationship between the skills addressed by the education and training undertaken by the respondents and the respondents’ most important skills ($\chi^2 = 21.096$, df = 12, $p < 0.05$); the topics and information shared with contacts outside the business ($\chi^2 = 21.200$, df = 12, $p < 0.05$); and with the topics and information shared with their friends and relatives ($\chi^2 = 27.321$, df = 9, $p < 0.05$). These results would suggest an alignment between the skills the respondents saw as being most important for them, the information gathered through their business and social relationships, and that undertaking some form of education and training program was seen as the best way to address that particular skill need. The literature reviewed in the course of this study has some resonance with these results. For instance, Raffo, Lovett, Bank & O'Connor (2000), in their study of teaching and learning for entrepreneurs working in creative industries, conclude that pathways can be developed for professionals through a community, and social and business relationships play a vital role in the exchange of ideas through informal settings. It is through these social and business relationships that individuals develop knowledge and understanding of operating in the creative industries. While Poell et al (2000) write that activities an individual would undertake for their skill and professional development would typically include external training, Bridgstock (2009) suggests the key
approaches to career building skills involves knowledge development, skills identification and identifying learning opportunities. However, in contrast to the role of formal education in addressing the skill and professional development requirements of the survey respondents, Raffo et al (2000) found that higher education and vocational education institutions provide insufficient learning and development opportunities in terms of technical and business skills for creative entrepreneurs and are seen as being too generalist and not detailed enough for certain sectors of the creative industries.

In summarising the question of formal education and training, and in addressing the question of what approaches the respondents have undertaken in their skill and professional development, it appears that a majority of respondents did undertake some form of formal education and training, predominantly through short courses, conferences and special events; and vendor courses, primarily in the creative industries and management sectors.

Informal learning

Respondents were asked to rate the importance (through the use of a Likert-type rating scale), of eight informal learning approaches. The results of this question provide further understanding, and in conjunction with the previous question, address the research question which was to determine the approaches taken to skill and professional development. The respondents were asked to rate each of the approaches from not important (1) to very important (5). The eight strategies identified from the literature (see Cheetham & Chivers, 2001; Eraut, 2004; Forfas, 2007; IBSA, 2009; Johnson, 1997; Pickard, 2007; Reiter-Palmon et al, 2006; Tak, 2008) were: books and manuals, journals and magazines, blogs and wikis, online networking sites and forums, conferences, discussions with work colleagues, outside business contacts, and friends and relatives.

The data indicated the most important informal learning approaches were: discussions with work colleagues (n=182, 98.9%; important or very important), the use of blogs and
wikis (n=178, 96.7%; important or very important), and attending conferences (n=172, 93.5%; important or very important). More than nine in ten respondents (n=171, 92%; important or very important) also felt that consulting with contacts outside their business was either important or very important. The least important approach was consulting with friends and relatives where 50.6% (n=93) of respondents felt it was either important or very important. This result would seem to indicate that a vast majority of respondents had accessed one or more of these informal learning approaches in their skill and professional development and would also suggest that informal learning is an effective method for an individual’s professional development. Table 28 below shows the level of importance of the various informal learning approaches.

Table 28: Importance of informal learning approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Percent Important/very important (n=184)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult work colleagues</td>
<td>4.90</td>
<td>0.333</td>
<td>98.9</td>
</tr>
<tr>
<td>Blogs, wikis and online forums</td>
<td>4.78</td>
<td>0.553</td>
<td>96.7</td>
</tr>
<tr>
<td>Conferences</td>
<td>4.70</td>
<td>0.703</td>
<td>93.5</td>
</tr>
<tr>
<td>Consult contacts outside the business</td>
<td>4.65</td>
<td>0.643</td>
<td>91.8</td>
</tr>
<tr>
<td>Online networks</td>
<td>4.49</td>
<td>0.981</td>
<td>88.6</td>
</tr>
<tr>
<td>Journals and magazines</td>
<td>4.12</td>
<td>0.927</td>
<td>71.8</td>
</tr>
<tr>
<td>Books and manuals</td>
<td>3.91</td>
<td>1.093</td>
<td>67.4</td>
</tr>
<tr>
<td>Consulting with friends and relatives</td>
<td>3.65</td>
<td>1.131</td>
<td>65.8</td>
</tr>
</tbody>
</table>

Comparisons of means were conducted in terms of the respondent’s years of experience, gender and informal learning approaches. In comparing the means (M) for this question based on years of experience, the most important approaches was consulting with work colleagues, for respondents with one to ten years experience (n=90, M = 4.94).
Accessing blogs and wikis (M = 4.84) was also considered important by those with one to ten years’ experience, while attending conferences and consulting with contacts outside the business (n=21, M = 4.81 respectively) was most favoured by those with less than 12 months experience in the industry. For respondents with ten or more years experience, the results indicated that their preferred informal learning approach was consulting with work colleagues (n=73, M = 4.86). Of further note, the approach considered to be least important, consulting friends and relatives (M = 3.95), was identified by those with less than 12 months experience in the industry. Table 64 at Appendix 12 provides a comparison of means broken down by years of experience of the respondents.

In relation to how this question was answered when viewed by gender, both males and females (n=103 and n=81 respectively) identified consulting with work colleagues (M = 4.94 and M = 4.87 respectively) as being important or very important. The next most favoured informal learning approach for females and males was accessing blogs and wikis (M = 4.81 and M = 4.75 respectively). The least important informal learning approach for females and males was consulting with friends and relatives (M = 3.70 and M = 3.60 respectively). The results of these comparisons show a similar pattern with the overall importance rating as shown above in Table 28, where consulting with work colleagues, accessing blogs and wikis, and attending conferences were considered the most important or very important informal learning approaches for respondents irrespective of years of experience or gender, and that most respondents saw the value and application of the more collaborative approaches to informal learning. Table 65 at Appendix 12 provides a comparison of means with respect to gender.

To further understand and examine the means of the subgroups within the wider group of respondents, Kruskal-Wallis tests, a non-parametric test of group difference (Gall, Gall, &
Borg, 2003) to measure the analysis of variance, were conducted to determine the possible differences between groups by years of experience and gender.

The comparison of mean scores based on years of experience identified differences in one of the eight informal learning approaches. A difference was observed for books and manuals ($\chi^2 = 8.835$, df = 2, $p < 0.05$). This result would suggest a difference in the importance of books as an informal learning approach is dependent on the years of experience of the respondent. This can be seen in Table 64 at Appendix 12 where the mean score for respondents with ten or more years of experience ($M = 4.22$) is significantly higher than for those respondents with less than 12 months, and those with one to ten years of experience ($M = 3.71$).

Differences in means were also identified in one of the eight informal learning approaches when the mean scores were compared based on gender. As was the case in the comparison in terms of years of experience with books and manuals ($\chi^2 = 15.829$, df = 1, $p < 0.05$), the between-groups analysis result could be considered as significantly different. By looking at the mean scores for the two groups, the most important approach for males was books and manuals ($n=103$, $M = 4.19$), while the mean score and standard deviation (SD) for books and manuals for females ($n= 81$, $M = 3.56$, $SD = 1.118$) showed it to be their least important or very important informal learning approach, with quite a difference of opinion across the female group of respondents.

The final question related to skill and professional development approaches asked what, if any, other informal learning approaches were used by respondents. Table 29 below shows that 50.0% ($n=92$) of respondents identified having used other forms of informal learning approaches in their ongoing skill and professional development. The majority of respondents utilised broadcast and print media ($n=23$, 25.0%), self-directed learning ($n=20$, 22.0%).
21.7%), some form of networking session (n=12, 13.0%), and the use of podcasts (n=12, 13.0%).

**Table 29: Other informal learning approaches**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Percent (n=92)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcast/print media</td>
<td>25.0</td>
</tr>
<tr>
<td>Self-directed learning</td>
<td>21.7</td>
</tr>
<tr>
<td>Networking sessions</td>
<td>13.0</td>
</tr>
<tr>
<td>Podcasts</td>
<td>13.0</td>
</tr>
<tr>
<td>Write blogs</td>
<td>5.4</td>
</tr>
<tr>
<td>Creative/innovation sessions</td>
<td>7.6</td>
</tr>
<tr>
<td>Mentoring sessions</td>
<td>7.6</td>
</tr>
<tr>
<td>Working in teams</td>
<td>3.3</td>
</tr>
<tr>
<td>Workshops</td>
<td>3.3</td>
</tr>
</tbody>
</table>

In further analysing and addressing the question of the approaches taken by the respondents to their skill and professional development, it was also reported that an overwhelming majority of respondents identified consulting with their work colleagues, accessing blogs and wikis, and attending conferences as the most important or very important approach to informal learning. It was also found that consulting with work colleagues for males and females was considered their most important or very important informal learning approach, and that regardless of years of experience, consulting with work colleagues was also identified as important or very important as an informal learning approach. Finally, some respondents utilised other forms of informal learning such as the use of broadcast and print media, self-directed learning and networking sessions.

**Interactions with business and personal relationships**

To further understand the approaches respondents took in their skill and professional development, and, more importantly, what was discussed in these interactions (in the past
seven days), three questions were posed in order to gather information about whom the respondents interacted with, and the nature of the information they shared. The questions were framed around interactions with work colleagues, contacts outside the business, and friends and relatives. The three categories of relationships provided a broader understanding of the respondents’ business and personal relationships, which were evidenced in the literature and which would assist in identifying how their informal learning networks aided their ongoing skill and professional development.

The results showed that 4.3% (n=8) of respondents did not interact or have discussions with their work colleagues with respect to their skill and professional development. Of those respondents who did, 95.7% (n=176) had some form of interaction with their work colleagues in respect to their skill and professional development. The vast majority of respondents (n=175, 95.1%) preferred to interact with their work colleagues by way of face-to-face discussions, while almost 93% (n=170) reported that email was also a preferred method of interacting with their work colleagues in terms of their skill and professional development. The respondents also identified SMS (n=84, 45.7%) as their least preferred method of interaction with their work colleagues. This would seem quite appropriate and may reflect the limited amount of information that can be garnered, sent and received via an SMS (or text). Table 30 below provides an overall summary of the interactions between the respondents and their work colleagues with respect to the methods they preferred. Tables 69 to 73 at Appendix 12 provide a more detailed breakdown of the individual interaction types.
Table 30: Overall summary of interactions with work colleagues

<table>
<thead>
<tr>
<th>n=184 respondents</th>
<th>Percent</th>
<th>Modal frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>95.1</td>
<td>175</td>
</tr>
<tr>
<td>Email</td>
<td>92.4</td>
<td>170</td>
</tr>
<tr>
<td>Blogs and wikis</td>
<td>87.5</td>
<td>161</td>
</tr>
<tr>
<td>Phone</td>
<td>84.2</td>
<td>155</td>
</tr>
<tr>
<td>Online networks</td>
<td>65.2</td>
<td>120</td>
</tr>
<tr>
<td>SMS</td>
<td>45.7</td>
<td>84</td>
</tr>
</tbody>
</table>

It can be reported there were seven topics that were the most frequent responses in interactions with work colleagues (or other business relationships; see Dale & Bell, 1999; Billett, 2004; Gourlay, 2002, and 2004; Marsick & Watkins, 1990; Raffo et al, 2000). The three most frequent topics were business management (N=48), software capability (N=47), and technical skills (N=36), which also correlate to being the most frequently identified by the respondents in terms of their most important current skill and professional development requirement (see Table 74 at Appendix 12). The chi square test for significance ($\chi^2 = 72.087$, df = 28, p < 0.05) confirmed a direct relationship between the topics discussed with their work colleagues and their personal skills. The remaining topics the respondents identified when interacting with their work colleagues were project management (N=30), designs (N=25), networking with others (N=25), and web development (N=22).

The next question posed about the respondents’ interaction types and relationships related to contacts outside the business. The results showed two interaction types as being the most preferred in making connections with contacts outside the business: the use of blogs and wikis (n=158, 85.9%) and face-to-face discussions (n=155, 84.2%). Of further note, the data showed the least preferred method of interaction with contacts outside the business was the use of online networking sites (n=90, 48.9%), and that almost 8% (n=14) of respondents did not have any form of interaction with contacts outside of their business in terms of their skill
and professional development. Finally, of particular note, 9.2% (n=167) of respondents reported SMS as being the least favoured approach when dealing with other business relationships. Table 31 below provides an overall summary of the interactions between the respondents and their contacts outside their business with respect to the methods they preferred. For a more detailed breakdown of the individual interaction types between the respondents and their contacts outside the business, please see Tables 75 to 80 at Appendix 12.

**Table 31: Overall summary of interactions with contacts outside the business**

<table>
<thead>
<tr>
<th>Method</th>
<th>Percent</th>
<th>Modal frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blogs and wikis</td>
<td>85.9</td>
<td>158</td>
</tr>
<tr>
<td>Face-to-face</td>
<td>84.2</td>
<td>155</td>
</tr>
<tr>
<td>Phone</td>
<td>76.6</td>
<td>141</td>
</tr>
<tr>
<td>Email</td>
<td>76.1</td>
<td>140</td>
</tr>
<tr>
<td>Online networks</td>
<td>48.9</td>
<td>90</td>
</tr>
<tr>
<td>SMS</td>
<td>9.2</td>
<td>17</td>
</tr>
</tbody>
</table>

With respect to the topics discussed with contacts outside the business, four areas recorded the most responses: networking with others (N=44), technical skills (N=39), designs (N=28), and business management (N=20). The chi square test of significance ($\chi^2 = 16.068, df = 16, p > 0.05$) suggests that there is no direct relationship between the topics discussed with contacts outside the business and respondents’ most important personal skills. However, two skills were reported in both questions: business management and technical skills. This may indicate some alignment between what is discussed with other business relationships and the respondent’s current personal skill and professional development requirements (see Table 81 at Appendix 12).
The final category of interactions related to those with friends and relatives or social relationships (see Cross et al, 2001; Falk, 1997; Fukuyama, 1999; Granovetter, 1985; Putnam, 2007). The results for this question showed that this was the least preferred relationship type for respondents in terms of their skill and professional development. The data showed that almost 46% of respondents (n=84) did not interact with or have discussions with their friends and relatives in terms of their skill and professional development. However, of those respondents who did network with their friends and relatives to identify skill and professional development opportunities, by far the most preferred method was through face-to-face discussions (n=96, 52.2%), followed by email contact (n=38, 20.7%). Table 32 below provides an overall summary of the interactions between the respondents and their friends and relatives with respect to the methods they preferred. A more detailed breakdown of the individual interaction types between the respondents and their contacts outside the business is shown in Tables 82 to 87 at Appendix 12.

Table 32: Overall summary of interactions with friends and relatives

<table>
<thead>
<tr>
<th>n=184 respondents</th>
<th>Percent</th>
<th>Modal frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face</td>
<td>52.2</td>
<td>96</td>
</tr>
<tr>
<td>Email</td>
<td>20.7</td>
<td>38</td>
</tr>
<tr>
<td>Phone</td>
<td>17.9</td>
<td>33</td>
</tr>
<tr>
<td>Blogs and wikis</td>
<td>8.7</td>
<td>16</td>
</tr>
<tr>
<td>Online networks</td>
<td>7.6</td>
<td>14</td>
</tr>
<tr>
<td>SMS</td>
<td>4.9</td>
<td>9</td>
</tr>
</tbody>
</table>

In terms of the type of information shared and gathered in these social relationships, four areas were reported, of which designs (N=20) recorded the most frequent responses (see Table 88 at Appendix 12). The other topics included business management (N=15), web development (N=13), and getting a qualification (N=10). Finally, in comparing the total number of interactions, and the modal frequency of interactions between intra-business (with
work colleagues), and extra-business (with contacts outside the business, and friends and relatives), it can be shown that interactions in some form between one and five times per week (N=297 and N=481, respectively) was the most frequent amount, regardless of whether it was internal or external to the business. Table 33 below provides an aggregation of all forms of interaction methods; a cross tabulation of topics discussed between work colleagues and contacts outside the business is provided in Table 89 at Appendix 12.

**Table 33: Aggregation of interaction types**

<table>
<thead>
<tr>
<th></th>
<th>Intra-business interactions</th>
<th>Extra-business interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>297</td>
<td>481</td>
</tr>
<tr>
<td>6 to 10</td>
<td>136</td>
<td>123</td>
</tr>
<tr>
<td>11 to 20</td>
<td>105</td>
<td>63</td>
</tr>
<tr>
<td>21 to 100</td>
<td>61</td>
<td>22</td>
</tr>
<tr>
<td>More than 101</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>605</strong></td>
<td><strong>691</strong></td>
</tr>
</tbody>
</table>

**Discussion**

This chapter provided the findings and analysis of the quantitative phase of this study. This phase of the study was aimed at partially addressing two of the four research questions which focused on the key skills and professional development requirements and the approaches undertaken by professionals in the digital content industry to their ongoing professional currency. The survey findings showed that business, social and personal networked learning approaches are very important for the skill and professional development of digital content professionals.

Social and networked learning approaches are very important for industry professionals. Questions were posed in the survey to understand how the respondents interacted and accessed their business and social relationships to aid in their skill and
professional development. The results for these questions provided a strong indication that the respondents interacted with their business, and personal relationships. It was found that interacting with work colleagues and with contacts outside the business were important mechanisms in skill and professional development. The evidence of the importance of face-to-face discussions was evident when the respondents were asked about the types of interactions and the information that was shared. The analysis clearly showed that face-to-face interaction with their work colleagues (n=175, 95.1%), contacts outside their business (n=155, 84.2%), and with their friends and relatives (n=96, 52.2%) were their preferred methods in sourcing and/or sharing relevant skill and professional development knowledge. This finding would seem to be consistent with the literature reviewed in the course of this study (see Billett, 2004; Dale & Bell, 1999; Marsick, & Watkins, 1990; McWilliam & Haukka, 2008; Nonaka & Takeuchi, 1995; Poell et al, 2000; Skerlavaj et al, 2008; Tak, 2008), which argues that activities such as conversations based on a work and business context occurs in three ways: internal to the business with work colleagues, externally in the form of networks where the learners have a contacts within their professional field, and through personal contacts and relationships that can be used to share information and ideas, build knowledge and be accessed to contribute to an individual’s learning. So much so that social networks afford the learner engagement in a social setting where learning takes place, and that people participate in a social group where they develop common understandings and are socialised into the group. In focusing on how social networks and relationships support information sharing, the literature highlights three key areas: knowing what another person knows, gaining timely access to that person, and utilising existing and professional relationships.

The use of various online technologies was important for the survey respondents for professional development. In terms of interacting with contacts outside the business (other
industry professionals) the findings showed this as being important, particularly through the use of online tools (such as email and blogs, wikis, and online forums) and through face-to-face discussions. The difference in approaches could indicate that for some professionals, and for some skills, the opportunity and/or need to learn is affected by a need for just-in-time learning (through the use of some form of online technology/s), while for others having access to like-minded professionals either at the workplace or in a face-to-face discussion was considered more relevant. From the survey findings, the skills cited by the respondents fell into two categories: skills that are best sourced and/or shared via some online method, and those which lend themselves more to face-to-face discussions. Information and knowledge on skills such as designs, software knowledge, technical/technological and web related skills were predominantly sourced and/or shared by accessing blogs, wikis and email, while it was felt that skills such as business management, project management and being able to network with other professionals were best addressed in a face-to-face mode. These results clearly show the respondents’ need to access just-in-time information and knowledge as it related to their work and job function. This finding clearly supports the contentions of Grabinger & Dunlap (2004) when they suggest this type of on-demand information is supported and promoted by online technologies for two reasons: (1) learners expect to have access to immediate learning opportunities, and (2) their learning is seen as being directly applicable to their professional setting.

The respondents identified a range of skills they saw as being important for people working in the industry: business management, communications, technical ability, software knowledge, networking with others, creativity, project management, and keeping abreast of industry trends. These results are interesting in that they appear to align to what the literature calls generic skills, which are seen as being applicable to all workplaces and job roles, and which are also highly transferable. The importance of these skills is such that they describe
non-technical skills and competencies that play a significant part in contributing to an individual’s effective and successful participation in any workplace. It can be noted that these findings are also in line with parts of the literature that concludes that skills such as business management, marketing, and software knowledge are considered core skills for people in the digital content industry (AIMIA, 2005; CIE, 2005). Other literature reports that technology and technical skills, and people-related skills such as team-work, communication, planning and organising are important for people working in highly technological and innovative environments (Forfas, 2007; McWilliam & Haukka, 2008).

Formal education and training, mainly though short courses (typically between 2 and 10 days), was seen as an important approach in the area of skills development, as it met an immediate skill and development need for the learner and the employer. The most reported skills that were addressed by attending some form of formal education and training program included technical skills, web development, networking with others, and business management. A sample of some verbatim responses provided by the respondents of the skills these courses offered included “social media marketing, SEO, content development” (ID015), “web environments” (ID044), “2D and 3D software” (ID115), “online and digital media” (ID121), and “apps development and design” (ID181). This finding is also highlighted by the fact that in a majority of cases (N=151, 88.3%) the respondents reported the course was funded by their employer or themselves. It could be argued that as employers were paying for the courses, the professional short courses offered not only the learner but also the employer a short, sharp, focused program that provided the necessary skill development related to the employee’s work. The respondents reported that they completed short courses to address the types of skills that were identified by AIMIA (2005) and CIE (2005) as lacking in university and TAFE graduates. This result is significant in that AIMIA (2005) notes that there are capability deficits in the digital content industry, and that a number of businesses had
difficulty getting staff due to the lack of skills in creativity and management skills. Of particular note, the survey results showed TAFE and/or university courses only accounted for a small number of responses to this question. This could be attributed to the fact that university and TAFE programs (typically 12 months or more in duration) are unable to fill the immediate skill gap required by either the learner or the employer. It is argued that professionals are moving to a just-in-time (see Grabinger & Dunlap, 2004; McLoughlin & Lee, 2007) model of skill development in terms of seeking and developing the skills needed for their job through approaches such as short courses and online technologies. Of particular relevance to the outcomes of this study is the question of what is sourced from online technologies as opposed to face-to-face discussions. This question is further investigated in the analysis of the interview data from this present study.

It could be speculated that certain skill sets lend themselves to being best developed either through some form of formal education and training program or through a more informal learning approach, or even a combination of approaches. The survey results suggest that skills such as business management, marketing, design, and communications lend themselves to being addressed through a formal education and training program, while skills such as design techniques, technical, technological, and software knowledge can be best sourced and/or shared through online resources such as blogs, wikis and email, as that medium provides access to immediate and current information. The results also seem to suggest that face-to-face discussions with work colleagues and other industry professionals are mainly used to engage and interact with their various business and social relationships to stay abreast of current industry trends. A sample of some verbatim responses provided by the respondents of the skills addressed by interacting with their business and social relationships included “trends and presentation themes from the SxSW conference I attended” (ID028), “web technology, script development, and technical writing” (ID047), “designs and 3D
models” (ID100), “business direction and outsourcing technical work” (ID140), “qualifications and courses at uni and TAFE” (ID166), and “networking and industry updates” (ID184). This is further investigated in the interview phase of this present study and could also be the subject of further study.

The use and access to various online resources were identified as an important mechanism for the skill and professional development of the respondents. The survey findings clearly point to the value and use of information technologies as an important approach to informal learning. In particular, the respondents identified strongly with the importance of blogs, wikis, online forums and online networking sites as venues for informal learning. This finding would seem to support the assertions made by McWilliam & Haukka (2008) and Tak (2008) when they argue for the function of online technologies as a method of learning. The results also show that respondents interacted with their work colleagues predominantly via email, blogs and wikis, and to a lesser extent via online network sites. In terms of their online interactions with other industry professionals, this was mainly enacted via blogs and wikis, and to a lesser extent via email and online networking sites. Finally, the respondents reported their online interaction with their personal relationships was primarily via email. Whether it be topics such as the use of online technologies, technical and technological skills, keeping abreast of industry trends, the need to stay current and up-to-date with software knowledge, coupled with the use of social learning approaches, it would seem that most professionals prefer to access some form of online resource. It should be noted the questions posed in relation to respondents’ interactions focused on the skills that were addressed through these interactions and through what medium the interaction was enacted. The detail of the skills that are addressed by online technologies and other informal learning approaches is further explored in the interview analysis of this present study.
The differences in the topics discussed and shared were reflective of years of experience of the respondents. There were some differences in the survey results when looking at the importance of the various informal learning approaches in terms of years of experience and gender of the respondents. It was found that, generally, those with less than 12 months, or between one and ten years, experience would be more inclined to access some form of online resource for their professional development. Conversely, those with ten or more years experience felt that accessing books or having some form of face-to-face discussion would best serve their ongoing professional development. These findings could lead to suggestions that those with ten or more years experience could be impeding their professional currency as they are not accessing the most current skills. This result is suggestive of different learning preferences and learning styles within the respondent group, as was evidenced in the breakdown of the data by years of experience. Much has been written (such as Kolb, 1984; Honey & Mumford, 1992; Rezler & Rezmovic, 1981) about the relationships between learning styles and learning preferences, with the aim of tailoring teaching and learning methods to the ways that learners prefer to learn. Kolb (1984) argues that for some learners it is a choice of one learning situation over another, while Rezler & Rezmovic (1981) suggest for some learners it is a case of using teaching methods to suit their learning styles. Other writers (such as Gardner & Korth, 1998; Sadler-Smith, 1997) assert the view that several learning options would be helpful for learners, with respect to their learning styles and preferred learning situations. They argue that learners benefit from a range of learning approaches, such as individual versus group learning, doing presentations, case studies, team projects or writing a paper. The implication for the industry and, indeed, for educational institutions, underscores the necessity of using a variety of learning methods, the need to encourage professionals to be receptive to different learning methods, and the provision of better online support networks. Given these findings, recommendations and
implications have been developed for educational institutions, industry associations and industry professionals in terms of enabling more effective skill and professional development within micro business industry professionals. This will be discussed further in Chapter 8.

Finally, the differences in topics discussed and shared were also reflective of gender differences and roles. The gender differences were likely to be reflective of skill requirements associated with the different roles occupied by males and females within the industry. It was found that males typically worked in managerial/project manager, design, development, IT and web type roles, while females tended to be employed in administration, clerical, artistic and marketing type roles. Typically, males identified with business management, project management, technical/technological and software skill needs, while female skills centred on creativity, social and digital media, and industry trends.

Summary

The results of the survey showed that engagement in some form of formal education and training, the use of various forms of informal learning approaches, the utilisation of business and, to a lesser extent, personal relationships aid an individual’s skill and professional development and would appear to be highly valued by professionals in the industry. The survey findings, while not exhaustive, raise some further questions and considerations, such as identifying what information is sourced from online technologies as opposed to face-to-face discussions, or the apparent benefits of the work and professional relationships of professionals in terms of their ongoing skill and professional development. The findings were taken into account in the course of documenting the conclusions and recommendations of this present study, and also offer possible issues to be explored in future studies.
The next chapter outlines the first part of the findings and the themes from the interview phase of this study, which was aimed at partially addressing research questions one and two.
Chapter 5

Interview data and results

Introduction

This chapter reports on the first part of the interview data and findings of this study. This phase involved qualitative interviewing of professionals from within the digital content industry. The first section provides some background information on the interviewees and their businesses; the second section focuses on the key themes that emerged from the interviews, those that centred in the skills needed in the industry and the approaches to professional development taken by the interviewees. The intention of this part of the interview phase was to partially address two of the four research questions, namely: (1) identify the key skill and professional development requirements of digital content professionals in micro businesses; and (2) what approaches they undertake for their skill and professional development. This phase also expanded on the findings that emerged from the survey data results. The outcomes of the interviews are discussed during the analysis and synthesis of the data in this chapter.

Research process and methods

The questions developed for the interviews were aimed at drawing out as much information as possible in relation to the skills needed in the industry, the approaches taken to ongoing professional development, and how their various business, social and personal contacts and relationships contributed to their ongoing professional development. The questions are shown at Appendix 5.

Each interview was recorded, transcribed and analysed to identify key themes. In line with a semi-structured interviewing process, a set of interview questions were developed based on the key themes and topics identified in the literature review and the survey data, as
well as allowing the interviewer to further explore themes or ideas that arose in the interview (Patton, 2003).

Using purposeful and maximum variation sampling, a number of micro businesses in the Brisbane area were approached to take part in the interviews. The manager/owner/general manager was approached and invited to be part of the study, first using personal contact and then by a follow-up email with an attached information sheet, and a formal invitation to take part. Upon acceptance of the invitation, an appropriate date and time was agreed for the interview/s to be conducted.

Data analysis

The data analysis was conducted for each individual interview transcript, by identifying emerging themes, key words, issues related to the research questions, the survey findings, and linking them back to the literature. In discussing the identified themes, Grbich’s (2007) approach to thematic analysis is used, an approach which reduces the data, while also exploring key themes, words and phrases that are related to the research questions and the literature. She describes the process of reducing the transcript data into meaningful groupings by using a “block and file approach” (p.32). Grbich (2007) argues that while this approach can keep large portions of data intact, it can also allow the data to “speak for themselves” (p.32) without any predesigned themes being imposed. In discussing the approach, Grbich (2007) offers a process by which portions of the transcript data is highlighted, grouped and placed in a table with headings to categorise the key words or themes in each column.

The researcher determined that this approach was best suited to the study as it was not constrained by pre-existing themes or categories but allowed for the management of large transcript data, and this would be better for understand issues central to the research questions. Given this, 35 themes and key words were identified from the transcript data. These themes and key words were then grouped into two categories that were aligned to the
research areas of this study: skills required in the industry, skill and professional development approaches. A list of the key words and themes is provided at Appendix 11. The interview responses were categorised into similar groupings, which were developed using the definitions and descriptions used in an array of works: Eraut’s (2004) list of workplace skills, Mumford, Peterson & Childs’ (1999) Occupational Information Network (ONET) skill list, the National Centre for Vocational Educational Research’s (NCVER, 2003) generic skills listing, and various 21st century skills frameworks proposed by Binkley, Erstad, Herman, Raizen, Ripley & Rumble (2010), EnGauge (2003), International Society for Technology in Education ICT (ITSE, 2007), Jenkins, Clinton, Puroshotma, Robinson & Weigel (2006), and Partnership for 21st Century Skills (P21, 2006).

**Interviewees**

A total of eight interviews were conducted in this phase of the study with industry leaders in their respective fields. In order to understand the context and purpose of the business and the role of the interviewee information was gathered about the businesses as well as the occupation of the interviewee at the business. A summary of the interviewees and their businesses is now provided.

**Business 1**

One interview was conducted at this business. The interviewee was the owner of the business. The interviewee described the business as a digital marketing agency or a digital and interactive marketing agency. Their primary purpose was to provide digital marketing solutions, which included strategy, build, design, support, and copy. They had offices in Brisbane, Sydney and Auckland. They employed eight full-time staff and supplemented this with contractor staff on a project-by-project basis.

The interviewee was the owner and director of this business. He had had over 17 years in the industry and was, at the time, the sales and business manager, although he had
worked in other roles in the industry as a project manager, sales and marketing manager, and business development manager. His skills and expertise included social media, digital online marketing and advertising. He held a Bachelor of International Communication and Interactive Marketing.

**Business 2**

Two interviews were conducted at this IT, applications and digital publishing business. The business delivered content to tablets and other devices, with many apps available at the App Store. They provided the tools that allowed designers, developers, media agencies and content owners to create multimedia applications. They also provided consultancy services, rebates and sales collateral and joint marketing programs, multimedia apps, interactive digital magazines, event apps with maps, calendar functions, social feeds and note taking, sales decks, and corporate communications applications.

The first interviewee was the Chief Technology Officer. His role was related to anything dealing with technology, which would include product development, management and testing, project management, release management, and work prioritisation. He had over 12 years’ experience in the IT industry as a software engineer, consultant and lecturer. He began work on such projects as security infrastructure, advanced web based clients, Windows and applied web technologies. He had worked in the United States, and worked in enterprise development for many large Australian companies. He co-founded the present application development business, which became Australia's leading iPhone, iPad, Android, and tablet development house. He had experience in a diverse range of technologies and programming languages, such as Java, Ruby, Scala, C++ and Haskell, experience in front-end web development and large-scale backend systems, and played an active role in Brisbane’s local functional user groups. The second interviewee at this business had been the Development Lead at the business for the past four years. His was a technical role that involved creating
software, as well as being a team leader and setting technical direction for others in the technical team. His role was mainly centred on architecture of systems, idea development, planning, and some software development, and he specialised in Ruby on rails, iOS development, Scala, and Haskell programming languages. He had had over eight years in the IT industry as a software developer and consultant.

Business 3

The owner of this graphic design business was the only sole trader interviewed as part of this study. The business includes design, idea development, creativity, reading and interpreting briefs, art and illustrations, creation of samples thumbnails and storyboards, web and online content development, client management, and all facets of business, financial and contract management. At times she uses freelance and contractor staff on an as-needed basis for specialist skills, or if she is too busy. She had had over 13 years in the industry and chose to be a sole trader primarily as a lifestyle choice, as she had a young family.

Business 4

One interview was conducted at this online marketing and communications business. The business employed six full-time people plus contractors for specialty work such as project management, production, and creative designs. The business was focused on marketing, communication, social commerce, application development, traditional advertising, social, digital media, application building, public relations, and online marketing. The interviewee was one of the directors at the business. He had had a long history in media, entertainment and technology. He had worked with the founder of eBay and had helped build Participant Media, the production company that went on to win four Academy Awards. He had also worked with the founder of Facebook, built media and production for television, led entertainment business development for Amazon, and consulted to, and worked with, Comcast Cable & Interactive and HBO. His role at this business was in idea development,
sales, social and digital media alignment with the client’s requirements, and client management.

Business 5

Three interviews were conducted at this games development business. The studio developed Facebook games, real-time strategy, and real-game play approach games. In the studio’s early days, they created a number of downloadable casual games, including creature simulation games, brain training games and hidden object games. It then progressed to become a social media game development studio primarily focused on developing games for Facebook and social media audiences.

The first interviewee was the lead developer at the studio. He had been in the games industry since 2004. He started in Adelaide, at a local games studio, and then moved to Melbourne and started working in a company primarily responsible for a console game, mainly flight simulation type games. He moved to a larger games studio in Brisbane, which was subsequently bought out in 2007, and moved to this current business in 2011. The second interviewee was a game play programmer who had been in the industry for over three years. After gaining a qualification in games at QUT in 2009, he spent a couple of years working as a programmer at QUT, and then joined this games studio. The final interview at this business was with the general manager. He had started as an accountant in 1990 and worked for a large games company for 12 years. During this time, he moved into business management and, ultimately, set up and managed the business in the Asia-Pacific region. This was a precursor to his next job, at another games studio, where he set up and staffed the company’s Brisbane studio. In 2006, he co-founded the present games studio.
Skills required in the industry

The data presented in this section focuses on addressing research question one, which was to identify the skill and professional development requirements of digital content professionals working in micro businesses. The skills discussed in this section are divided into two areas: job-related or occupational-specific skills (Mumford et al, 1999) and meta-cognitive skills (Eraut, 2004), which are skills that emphasise the upper end of thinking (Binkley et al, 2010).

Seven job-related or occupational-specific skills were identified by the interviewees: industry trends, business management, communication, technical and technological, design, creativity, and entrepreneurship. Each of these skills was coded by using a combination of the skill frameworks and skill and competency lists that were identified in the course of the review of literature (for example Binkley et al, 2010; EnGauge, 2003; Eraut, 2004; ITSE, 2007; P21, 2006; Mumford et al, 1999). Table 34 below provides a summary description of the key skills identified by the interviewees as offered by the various frameworks and skill lists. It is worth noting that notwithstanding the relevance and importance of 21st century skills, the broader generic types of skills identified by writers such as Cheetham & Chivers (2001), Eraut (2004), Forfas (2007), NCVER (2003) and Mumford et al (1999) also have some foundation and resonance with the skills described in the 21st century skill frameworks.

Table 34: Job-related skills summary

<table>
<thead>
<tr>
<th>Skill</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry trends</td>
<td>Identify trends and forecast possibilities (ITSE, 2007)</td>
</tr>
<tr>
<td>Business management</td>
<td>• Delegation, supervision, and leadership (Eraut, 2004)</td>
</tr>
<tr>
<td></td>
<td>• Planning, and organising (NCVER, 2003)</td>
</tr>
<tr>
<td></td>
<td>• Business literacy (P21, 2006)</td>
</tr>
<tr>
<td>Communication</td>
<td>• Communication skills (Binkley et al., 2010; P21, 2006)</td>
</tr>
<tr>
<td></td>
<td>• Communicate with peers, experts, and multiple audiences (ITSE, 2007)</td>
</tr>
<tr>
<td></td>
<td>• Communicate ideas and information (NCVER, 2003)</td>
</tr>
<tr>
<td>Skill</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Technical and technological</td>
<td>• ICT literacy (Binkley et al, 2010)</td>
</tr>
<tr>
<td></td>
<td>• Possess technology and operations concepts, demonstrate sound understanding and use of technology systems (ITSE, 2007)</td>
</tr>
<tr>
<td>Design</td>
<td>• High productivity and high-quality products (EnGauge, 2003)</td>
</tr>
<tr>
<td></td>
<td>• Having knowledge about products services using specialist knowledge in the design process (Forfas, 2007)</td>
</tr>
<tr>
<td></td>
<td>• Analysis of requirements, design of items and products, drafting and specifying technical requirements and implementation and testing (Mumford et al, 1999)</td>
</tr>
<tr>
<td>Creativity</td>
<td>• Creativity and innovation (Binkley et al, 2010; P21, 2006)</td>
</tr>
<tr>
<td></td>
<td>• Inventive thinking and creativity (EnGauge, 2003)</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>Entrepreneurial literacy for 21st century content (P21, 2006)</td>
</tr>
</tbody>
</table>

**Job-related skills**

A number of skills emerged as key themes that resonated throughout many of the interview transcripts. The key words and phrases that emerged from the transcripts were distilled down to what Dede (2010) calls 21st century skills, while also having some alignment to the skills lists and taxonomies described by Eraut (2004), NCVER (2003), and Mumford et al (1999).

**Industry trends**

The interviewees raised several issues in relation to the industry and how it is impacting professionals in terms of their ongoing professional currency. A key theme that emerged in the interview analysis was the rate of change in the industry, coupled with the importance of keeping abreast of industry trends. A majority of the interviewees discussed the notion that their professional currency was directly related to what was happening in their particular sector of the industry and that staying informed was critical to their job and, indeed, how they integrated within the industry. One interviewee suggested “staying informed with international trends, that’s the be all and end all” (I01).
Another facet that was discussed by this interviewee was the issue of rate of change in the industry, which was coded as part of the broader area of keeping abreast of industry trends as highlighted by several other interviewees. The comments made in relation to the pace of change showed it directly impacted on the interviewee’s need to progress their professional currency and confirmed that professionals in the industry work at the forefront of technological advances:

Well the sheer rate of change that our industry suffers is the benefit and the curse of working in the industry. It’s a benefit because it’s exciting and its change and its opportunity. But it’s also the curse because as a business in this industry it’s really, really hard to invest time and learn things which are going to have a commercial payout of anything more than twelve months ... the rate of change is incredible. (I01)

This interviewee then added that the use of technological devices such as the ipad, the laptop and smartphones have changed how he stays in touch with what is happening in the industry:

Because like I said before, the rate of change that we suffer in this industry is just mammoth, and if we can pre-empt that by knowing what’s going on elsewhere, then it gives us opportunity ... the technology is only now just catching up where we’ve got ipads, mobile internet, we’ve got faster phones, we’ve got cameras with decent things on them and so my watching of that development over the last couple of years, and if I wasn’t listening to what was happening in the market I wouldn’t be able to go out and sell it ... it’s part of the whole ecosystem in terms of how we work. (I01)

Another interviewee pointed to the need to identify what is important in his role as a chief technological officer, given the constant change within the industry: “there's constant change, you can't deal with everything ... you've got to figure out what's important and what's not” (I02).
Several interviewees highlighted the fact that staying informed and keeping abreast of industry trends was just as important as progressing their professional currency. This is also supported by the survey findings where keeping up with industry trends was identified as an important requirement for the industry professionals. To highlight the importance placed on industry currency, some verbatim responses cited by the survey respondents include “keeping up to date with cultural / society trends” (ID024), “look at emerging trends” (ID109), “keep up with relevant and current industry trends” (ID152), and “exposure to new trends” (ID169). The importance of keeping up with industry trends is taken up by ITSE (2007) in their 21st century skills framework for ICT education. They argue that learners and workers should interact and collaborate with peers and experts in order to identify trends within their industry. The relevance of the rate of change within the industry and keeping abreast of industry trends is also discussed by the Australian Interactive Media Industry Association (AIMIA, 2010) and Innovation and Business Skills Australia (IBSA, 2009) as playing an important role in the ongoing professional development of workers in the digital content industry. In outlining the role that professional development courses play, AIMIA (2010) and IBSA (2009) argue that the rate of change within the industry, and indeed keeping abreast of those changes, is an important avenue for industry professionals to stay current in terms of practices, trends, skills, and techniques within the industry.

The comments offered by the interviewees and the survey respondents clearly show a link exists between the pace of technological change in the industry, their need to maintain and progress their skill and professional development, and in identifying and prioritising what is important and relevant in terms of their job.

Business management

A number of the interviewees in this study identified a range of business management skills they felt was important.
One interviewee commented:

Well, there's definitely elements of management you need to be able to communicate and work with other team members but there is obviously a guy that manages the small team here ... other games studios might have been a team of fourteen or so, but here we've only got two guys - it still requires a management. (I06)

When asked to identify the key skills needed in the industry, two interviewees identified the broader themes of human resource management and leadership as being particularly relevant. One interviewee noted “at my level it’s not so important to have business management skills ... I'm not really responsible for hiring anyone ... certainly if you get towards the top end jobs you also have good human resource skills” (I07). Another interviewee identified skills such as teamwork and leadership as being important in his role as a general manager: “things like leadership, developing a team, all those soft skills are things that typically engineers don't come inbuilt with” (I08). It is worthwhile noting that business management skills was consistently reported in the survey findings as being one of the most important skills needed by industry professionals. These findings are further supported by the survey results, where it was shown that business management related topics garnered the majority of responses to the skills related questions. This suggests that the survey respondents felt that business management was not only one of the key skills needed to work in industry, but was also one of their most important current skill requirements, and one of their most important future skill needs. NCVER (2003) were quite clear on the value and importance of business management skills. They contend “it is almost impossible to think of a job role where planning and organising is not a critical function” (p.28). In terms of 21st century skills, the various frameworks are not as specific in the requirement of business skills. P21 (2006) identify business skills in their framework and state that business, financial and economic skills are a key requirement for 21st century workers.
Communication

There were a small number of comments made in relation to communication skills. The lead games developer suggested that communication skills play an important part in planning and working with others in project teams:

*It's a challenging thing but that's where the communication skills are very important, you're taking creative elements and turning them into a technical outcome. At the end of the day, you have to be able to communicate this idea to a programmer and he's going to actually write the nuts and bolts code. So you definitely are a bridge between the different disciplines ... there's obviously the ability to write, you need good documentation and writing skills.* (I06)

The small number of comments offered by the interviewees could be due to the fact that in the semi-structured interviews the interviewees were permitted to identify whatever skills they wished, and that communication skills were possibly, for some, not as top-of-mind as other skills. It could be argued that this is due to the fact that in some of the skill sets (for example Mumford et al, 1999; NCVER, 2003) communication as a skill is identified in terms of simple oral and written communication rather than the capacity to engage in richly structured and complex interactions due to the changing nature of work and jobs and the emergence and capabilities of ICT in the 21st century (Dede, 2010). As such, the interviewees may have considered communication as an inherent or generic skill. However, a number of interviewees did in fact identify communication skills in relation to meeting clients’ needs, and this will be discussed later in this chapter.

This comment, and indeed this finding, is further supported by the survey findings, which showed that communication skills was an important skill to possess in the industry, and the respondents also felt it was an important focus for the development requirements for an individual’s future skill set. It was reported in the survey findings, and in parts of the
literature (see EnGauge, 2003; ITSE, 2007; P21, 2006; Mumford et al, 1999; NCVER, 2003), that communication skills (both written and verbal) were important skills needed for individuals working in the broader creative industries. For example, in the survey results many respondents cited communication type skills as an important skill requirement to work in the industry. This was illustrated by the number of respondents who cited “communication skills” (for example ID004, 008, 035, 036 111,122) as an important skill requirement for industry professionals. Communication skills is also at the core of a number of 21st century skills frameworks (such as EnGauge, 2003; ITSE, 2007; Jenkins et al, 2006; P21, 2006) where the various frameworks contend that communication skills such as interactive communication, the use of various media and teamwork are key in a worker’s skill set. This result also confirms suggestions by Cheetham & Chivers (2001), ITSE (2007), P21 (2006) and NCVER (2003) that communication skills is not only a key requirement for individuals working in highly technical and technologically based roles, as is the case for those working in the digital content industry, but is also an important generic skill (Forfas, 2007).

Creativity

Three interviewees recognised the importance of creativity as part of the skill set for working in the digital content industry. Their comments centred mainly on idea creation and generation. The sole trader/owner of the graphic design business, in describing her role as a graphic designer pointed to the importance of the creative idea development as a key facet of her work:

Obviously coming up with an idea, a creative idea whether that be just a brief which is based on words ... there’s a lot of trying to portray in picture and to create a graphical representation of what they are after ... so that would be obviously sometimes picture form or text form ... because it’s a creative thing if you start something on a computer the job becomes too restricted because straight away you
just say choose a certain approach or design or something, it restricts your creative thought because you can’t just then turn the page and go I’m going to do something else. (I04)

The director of the online marketing and communications business added further weight to the notion that creative skills were important, and suggested that imagination is also relevant: “you’ve got to be really creative, really imaginative but also really commercial” (I05). He went on to add that as part of having a commercial focus “you can come up with the best idea in the world but you have to do it right ... you have to be highly organised, and process driven” (I05). The lead games developer also discussed the role of creativity with respect to games development, in particular where people working in the games industry work on projects out of hours and outside of their normal work function, and it is in this environment he suggested they can be creative in their ideas:

When you get to do outside projects one thing that you don’t get to do working in a professional gamers' industry is do cool ideas ... you have to play it safe to a certain extent because you are dealing with a mass market ... your game is only successful if you sell to a certain number of people and you can only sell to a certain number of people if the ideas are accessible ... in order to try out the more unusual stranger ideas I do my own projects now. (I06)

These statements would seem to suggest a tension exists for professionals between being creative and having a commercial focus as part of the creative process. In contrast with the survey results, where creativity was not cited as much as in the interviews, these comments were just as poignant, and highlighted the importance of creative skills within the industry. The survey data showed that respondents felt that creativity was an important skill requirement for industry professionals in the 55 responses that were coded from across all three skills-related questions. The interview findings clearly support the survey findings and
the assertions of some writers that creativity is at the core of the digital content industry’s activities, along with technical and business capabilities and skills (see Caves, 2000; Cunningham, 2002; Hartley, 2007; Potts, Cunningham, Hartley & Ormerod, 2008). Creativity is also very prominent in the 21st century skills frameworks (see Binkley et al, 2010; EnGauge, 2003; ITSE, 2007; P21, 2006) that were discussed in the review of literature. The various 21st century skills frameworks identify that creativity is a core skill requirement needed for people working in innovative type roles and also links the notion of creative skills to innovation. For example, P21 (2006) contend that learning and thinking did indeed include skills such as creativity and innovation.

Entrepreneurship

Entrepreneurship skills was discussed by one interviewee. The director of the online marketing and communications business highlighted the fact that entrepreneurship is key to people in start-up and micro businesses:

-On the front end you know there’s the entrepreneur, there’s always the entrepreneur and/or the CEO and they are often the same person. But a lot of people start companies, if they’re lucky they get very big but they’re not the person to run the company. I think your path to running a company is to start as an entrepreneur ... the biggest companies in the world, from Google to Facebook to eBay have all been started by hard core entrepreneurs who ran their companies and then brought in the corporate CEO to run it for them. (I05)

Entrepreneurship was identified by only one survey respondent, who wrote: “I need to develop my entrepreneurial skills” (ID192). A theme that became evident through the course of the literature review is that micro businesses are considered entrepreneurial and innovative type businesses (see Devins, Gold, Johnson, & Holden, 2005; Raffo, Lovett, Bank, & O'Connor, 2000). Given that entrepreneurial skills was identified by the survey respondents
and interviewees, it supports what Raffo et al (2000) suggest includes businesses in “highly
technical, new media and ICTs emergent sector” (p.357), which would typically encompass
digital content businesses such as apps developers, web developers and games developers. It
would seem, however, that despite what has been argued by the literature, respondents and
interviewees in this present study were focused more on business and technical type skills for
their ongoing professional currency.

Technical and technological

In discussing their views on the key skills needed in the industry, four interviewees
commented that currency in technical or technological skills were relevant due to the nature
of the industry. The chief technological officer at the apps development business linked the
need for a strong technical background related to the job, and also believed that people
working in the industry should have a general skill set as opposed to a specialist focus of
skills:

*Strong technical background ... you could certainly come into this role from a more
product focussed area ... all these guys have got skills in different areas and a lot of
them have worked on different areas ... if you wanted to split it we’ve got IOS staff
and we’ve got back end service staff and almost everyone of these guys has worked on
both components. They’re generalists and that gives a lot of flexibility like if we
decide we need to do this next week then we can pull someone off the server and put
them on the client’s.* (I02)

The development lead at the apps development business highlighted the need for a
better understanding of a range of technological skills to ensure they integrate into their
infrastructure:

*The other thing would be the infrastructure in terms of the architecture and
understanding all the different pieces we have in place. We’ve got the iPhone apps,
we’ve got the Android apps, we’ve got our back end system then we’ve got six, eight
different services we talk to and all of them interconnect in different ways. (I03)

An interviewee from the games development studio reinforced the idea of needing a
strong technical background, but also identified the need to possess a variety of skills to work
in the games industry:

There’s also a technical aspect, we use a particular software and expect to code like a
programmer but it’s very useful to be able to do that because we need to be able to
prototype and have an understanding of how the technologies are going to go
together. (I06)

These results are also compatible with those of the survey findings. Like business
management, technical and technological skills figured very heavily as being an important
skill needed to work in the industry. The survey respondents felt that having technical ability
was not only important to work in the industry, but was also a key component of an
individual’s ongoing skill and professional currency. The survey findings, and indeed these
comments, are also supported by the claims made by a number of the 21st century skills
frameworks regarding the importance of technological skills and currency (see Binkley et al,
2010; EnGauge, 2003; ITSE, 2007; Jenkins et al, 2006). The 21st century skills literature
emphasises the need for greater fluency, competency and skill in technological and digital
literacies (Dede, 2010). The comments offered by the interviewees in relation to technical
and technological skills would seem to highlight a tension between having a general set of
skills and being a specialist. It could be concluded that this is due to the constant pace of
change and advancements of technology in the 21st century and is affecting the way people
work and learn (Voogt & Roblin, 2013). This will be discussed further in the discussion
chapter.
Software capability and knowledge

The need to develop their software and programming languages skills was identified by five interviewees. When asked to describe in general terms their views on the key skills needed to working the industry, software and programming currency featured strongly in the interview transcripts. The owner of the digital marketing business talked about his need to keep up with software changes and ongoing learning, and noted:

*The software changes dramatically every time a new iPhone is released, that’s only twelve months ... you can’t exist knowing the development skills from when you started on iPhone development, you have to skill up. We needed to get skilled up to be able to make the change, re-release the app plus include a version of the app for old iPhone users.* (I01)

Another interviewee suggested that his programming skills had changed in recent years and noted he now used what he called functional programming:

*The way I approach programming these days is completely different to what I would have done five or six, five years ago say ... I mean I haven’t been writing code for that long and it was almost a chance encounter that led to me getting interested in certain programming streams and this functional programming idea that’s completely changed the way that I now approach programming.* (I03)

In the games development sector, software skills were identified as being important. Both the lead developer and the game play programmer from the games studio commented on the importance of having strong software skills in working the games industry. The lead developer suggested that “most studios will have custom software” (I06) to use in the development process. While the games developer noted that in his role it was important to be able to use a variety of programming languages and the need to constantly to stay up-to-date:
I guess being able to program is certainly one of them. Being able to carry that across multiple languages too because I’ve found that you know quite often I’ll be hitting something new just about every time I start a new job ... well I started mainly with C plus plus and C sharp at university and then I had to learn Java and ActionScript 3, and also multiple development environments as well, like using Visual studio is different to using Eclipse. (107)

It was reported by the survey respondents that software skills and knowledge was an important future skill requirement and should be a key component of a person’s ongoing professional development plans. The survey findings and the comments offered by the interviewees are supported by contentions made in the various skills frameworks – that workers and learners need to possess and develop their software skills. P21 (2006) indicates that software literacy is relevant in the context of learning to develop 21st century content knowledge and skills, while ITSE (2007) are very specific and note that ICT skills are central to the 21st century. From these comments, it is clear that software skills and knowledge in areas such as iphone and smartphone software, Java, C++, and functional programming are crucial skill requirements, as they are constantly changing and impact on the professional’s development and currency. This result is supported by the results of a study by Zhao (2002), which focused on software and computer skills for business professionals. From his study, Zhao (2002) found that specific hardware and software related programming, and a number of internet and web related skills, were crucial for all business professionals. These include skills such as Windows operating systems, databases, Adobe applications, HTML, Visual BASIC, C++, and JavaScript.

Design

Given the highly technical and technological environment of the digital content industry, design skills also featured as a skill requirement identified by the interviewees of
Design skills were highlighted by the sole trader and owner of the graphic design business, the director from the online marketing business, and the lead developer from the games studio. The sole trader/owner of the graphic design business felt quite strongly about the need to have a holistic view of the graphic design process:

*Well obviously you’ve got to really understand the whole idea of graphic design and what it is and how to produce something from a design concept to a needed and used piece ... different than a commercial artist who would be an illustrator as well as what have you, it needs to be graphic design.* (I04)

In discussing the development process and building and delivering products for clients, the director at the online marketing business focused on engineering design aspects:

*There’s the engineering development design, which is building the products, which is taking the idea and actually making something physical out of it. Whether it’s an online product or an iPad or a TV commercial or whatever ... so there’s the production side, which is engineering, design, development, editorial all that stuff.* (I05)

For the lead games developer, from the games studio, his views centred on two types of design based on the look, feel and functionality of the game itself. He suggested that:

*Certainly for designers, in all the roles where I’ve been a lead, design mechanics, that’s your first and foremost skill. The ability to understand game mechanics and break that down into steps to producing it so it’s challenging ... but it’s not necessarily something you can write down in a set of dot points, for instance if you do industrial design there is a very, very strong design element, like literally the process of designing a functional piece of mechanical or whatever whereas in design it's typically more about coming up with ideas.* (I06)
These results are in contrast with the survey findings, where design skills were not mentioned by the respondents. In the survey findings, it was reported that designs were a feature of discussions or interactions with work colleagues, other industry professionals and within their personal relationships (their friends and relatives). However, the interview analysis showed that a variety of design skills were needed, exactly dependent on the person’s role within the industry. In particular, skills such as graphic and illustrative design, product development, as well as factors such as industrial design, mechanical and human design considerations were part of the game development sector and are crucial skill requirements for professionals working in a design-related business. The value and importance of design skills is highlighted in a study of 66 professionals by Lewis & Bonollo (2002). It found that design skills were highly valued by clients and fellow professionals. From their study, Lewis & Bonollo (2002) contend that design skills, which includes the design brief and specification, concept sketches and illustrations, refinement and, ultimately, production, are critical throughout the development process.

In summary, the previous section focused on addressing the research question aimed at identifying the key skills needed for professionals in the digital content industry. It was found that the majority of the interviewees felt that keeping abreast of industry trends and having an awareness of the rate of change within the industry was crucial to their professional currency. The key job-related skills identified and discussed by the interviewees were: staying abreast of industry trends, business management, communications, creativity, entrepreneurship, technical and technological skills, software knowledge, and design skills.

Skills such as business management and communications, which featured quite prominently in responses in the online survey, did not feature as much in the interviews, while other skills, such as creativity and entrepreneurship, were not mentioned as often in the survey or the interviews, but were identified in the literature as being crucial for professionals.
in the industry, particularly for those working in micro businesses. However, it was clearly identified that several 21st century skills frameworks saw the need for workers and learners to possess and develop such critical skills as communication, creativity and ICT related skills. The next section of this chapter focuses on the meta-cognitive, or higher order thinking, skills that emerged from the interview transcripts.

**Meta-cognitive skills**

The data presented in this section also focuses on the key skill requirements for digital content professionals working in micro businesses. In the course of the interview analysis it became apparent that the interviewees had identified not only the manifest job-related skills but also a set of higher-order, or meta-cognitive, skills that related to their ability in learning to learn and being able to identify the necessary skills needed to do their job. It is also worth reviewing how metacognition and learning to learn was described in the literature. Several descriptions were provided for learning to learn and metacognition from a range of sources such as researchers, skill lists and skill frameworks (for example Binkley et al, 2010; Entwistle & Ramsden, 1983; Flavell, 1979; Mumford et al, 1999; Saljo, 1979). Despite the diverse sets of descriptions, they all conclude that workers and learners should consciously think about how they learn and can develop their learning skills (metacognition); the ability to make choices about what and how to learn (learning to learn) are important and ongoing skill requirement for workers.

Five meta-cognitive skills were identified as part of the interview transcript analysis: adaptability, transdisciplinarity, translation of information, problem solving, and curiosity to learn. Each of these skills was coded and described by using a combination of the skill frameworks and skill and competency lists that were identified in the course of the review of literature (for example Binkley et al, 2010; EnGauge, 2003; Eraut, 2004; ITSE, 2007; P21, 2006; Mumford et al, 1999; NCVER, 2003). Table 35 below provides a summary description
of how the various writers, skill frameworks and skill lists described the various skills that were discussed by the interviewees as part of their metacognition, or their approach to learning to learn.

*Table 35: Meta-cognitive skills summary*

<table>
<thead>
<tr>
<th>Skill</th>
<th>Definition</th>
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| Adaptability               | • Inventive thinking and adaptability (EnGauge, 2003)  
• Life skills which includes adaptability (P21, 2006)  
• Adapting to new situations such as changed work conditions (NCVER 2003)                                                                                                                                   |
| Transdisciplinarity        | • Knowledge production related to beyond the traditional disciplines (Emmelin, 1993)  
• The interaction, translation, and synthesis of knowledge between and among scientific/technical, creative/cultural, and business/entrepreneurial disciplines, and between different sub-disciplines (Hearn & Bridgstock, 2010)  
• The activity that produces, integrates, and manages knowledge by incorporating science, industry and politics (Scholz, Mieg & Oswald, 1999)                                                                 |
| Problem-solving            | • Ways of thinking includes higher-order skills such as critical thinking, problem-solving, decision-making, which are linked to creativity and innovation (Binkley et al, 2010)  
• Problem-solving, decision-making, and the use of critical-thinking skills to manage projects, solve problems, and make informed decisions (EnGauge, 2003)  
• Problem analysis, decision-making, and generating, formulating, and evaluating options (Eraut, 2004; NCVER, 2003)  
• Learning and thinking skill which includes problem-solving and critical-thinking (P21, 2006)                                                                                                                   |
| Communication capabilities | • Interactive and effective communication (EnGauge, 2003)  
• Awareness and understanding of contexts, situations, colleagues, and customers (Eraut, 2004)  
• Interpreting information, and generating a range of options (NCVER, 2003)                                                                                                                                   |
| Knowing how to learn       | • Inventive thinking is linked to curiosity (EnGauge, 2003)  
• The ability to search for, and synthesise information (Jenkins et al, 2006)  
• Being open to new ideas and change (NCVER, 2003)                                                                                                             |
Adaptability

The notion of being adaptable was discussed by three interviewees in relation to being flexible, responsive, and being able to offer a diverse range of services. In discussing his views on the key skills needed for professionals in the industry, one interviewee argued for the need to be flexible and the changing needs of the market:

*The guys and girls that come through the industry need to be able to change their skill set on a daily basis. They have to react to the change in the market’s needs, the change in the perception of the market’s needs ... given the changes in we can be flexible and other companies lose the business because they’re inflexible. ... from an employees or a worker’s perspective, they can simply not just exist and make do.* (I01)

He went on to highlight the ever-changing nature of the marketplace and the digital content industry by giving an example of how iPhone software development impacted his employee’s need for keeping skills current:

*So as an iPhone developer the software changes dramatically every time a new iPhone is released ... you can’t exist knowing the development skills from when you started on iPhone development, you have to skill up. And the flow down effect of that is if we develop an app, here’s an example. So we developed an app for Nestle that had a menu structure built a certain way. IOS5 comes out, Apple completely changed the way that menu structures were developed so we had to tell our client, Apple has changed their software. We needed to get skilled up to be able to make the change, we needed to make the change, bill them for the change, bill them for our learning, re-release the app plus include a version of the app for old iPhone users .. if there was a reticence to learn from an employee then they’re not going to get anywhere ... the flexibility of the want and the need to be able to learn is the main reason that a) you lose people from the industry and b) people stay enamoured with it.* (I01)
A different view was taken by another interviewee when discussing adaptability and flexibility. He suggested a need for responsiveness and adaptability in project management in digital content projects:

*And then not involving people and then not, a lot of them will look at a spreadsheet or a Gantt chart or something and go ‘oh this thing needs to be built by this date’ ... it’s completely imaginary ... you do this plan at the start which is kind of how you imagine it will work out and within one day it’s going to change, and it’s never reflected to update reality and it’s just, I just think it’s a bit of a joke ... I don’t see project management being as important the product ... I don’t know my opinion of project managers is fairly dim in the industry.* (I02)

The skill of a person in being adaptable and flexible in any role within the industry was highlighted by two interviewees when discussing the need to offer a diversified set of services. In his role as the chief technological officer of the IT, applications digital publishing business, this interviewee argued that as a business they need to offer a diverse set of services to their clients on multiple platforms:

*We enable publishers, anyone who produces content to get their content onto iPad and to a lesser extent android devices and also iPhones ... so any IOS platform which is the only two really.* (I02)

These statements would seem to add weight to the meta-cognitive skills identified in the literature that points to the need of professionals to be adaptable, flexible able to offer a diverse set of services given the changing nature of the technology and the digital content industry (for example ITSE, 2007). These findings are further supported by the survey data, which showed that some respondents identified adaptability and flexibility as skills needed in the industry. An example of some of the verbatim responses offered by the survey respondents include “being adaptable” (ID006), “flexibility” (ID148, ID177, ID183).
survey results and the interview findings also clearly support the claims made by a range of writers when they argue that workers need to adapt to new situations, and when determining how to best achieve work-related outcomes (such as EnGauge, 2003; P21, 2006; NCVER, 2003).

Transdisciplinarity

In the course of analysing the interviews, transdisciplinarity skills were identified as another higher-order skill by several interviewees. The ability, and need, to bridge disciplines was highlighted by comments offered by the lead games developer. His first comment was related to communicating between, and among, different stakeholders:

"Technical outcomes at the end of the day, you have to be able to communicate this idea to a programmer and he’s going to actually write the nuts and bolts code. So you definitely are a bridge between the different disciplines." (I06)

His next comment added weight to the importance of transdisciplinarity skills for industry professionals, suggesting that his role encompasses a mixture of disciplines:

"You’re typically having to have a broad understanding. Just because I’m working on RTS (real time strategy) games, a solution might not come from that space it might actually come from a completely unrelated game type. So there are two or three different ways I deal with that. One is working my own project’s where I’m writing, designing, doing art all that kind of stuff for a game on my own. Two would be to obviously read a lot so cover a lot of titles so it’d be game design but also industrial design, graphic design, psychology, all that kind of stuff." (I06)

These comments are in line with Hearn & Bridgstock (2010) who contend that transdisciplinarity involves the interaction, translation and synthesis of knowledge between several disciplines. This was highlighted by one interviewee who suggested that gaining and developing new knowledge from several sources was important in his role. The lead games
developer suggested that as part of the games development process he regularly incorporated elements of different disciplines, such as psychology, industrial and graphic design, and human movement. Hearn & Bridgstock (2010) agree, and state that transdisciplinariness skills involve integrating new knowledge into a new product, design or marketing campaign. In scanning the survey responses, it is worthwhile noting that transdisciplinariness skills were not mentioned as such; however, several survey respondents identified the need to possess and work across disciplines in the identification of key industry skills: “understanding how the product will be used and the user experience” (ID002); “craft skills in areas of expertise either technical or non-technical, and the ability to understand and integrate the technical aspects into implementation” (ID024); and “bring in alternative disciplines into development to supplement your skills” (ID152).

Problem-solving

Two interviewees specifically discussed problem-solving as part of their respective roles. The development lead at the IT, applications, and digital publishing business in discussing his views on skill requirements suggested in his role it primarily involved problem-solving and critical thinking:

*I guess at its core its problem-solving. We get, our requirements, they’re really problems that have to be solved ... we have to make the application work in a certain way which means we have to work out how all the different pieces fit into the solution and what the solution is going to be. So it’s that ability I guess to decompose a little feature into its components and solve the problems from that.* (I03)

In his role as the lead games developer, this interviewee suggested that in every project problem-solving was important as every game and its components are different:

*You need the ability to, I guess you call it problem-solving but it’s specific to games ... it’s the way to come up with game mechanics for a game. And that’s where the
trickiest part is because obviously every game, or most games, there are differences between them. So you might be doing an RTS (real time strategy) this week and a year ago I might be doing a car game so the requirements are completely different ... in that one I needed to understand about car physics, this one I need to understand statistics. Then there’s also a technical aspect, and being able to code like a programmer but it’s very useful to be able to do that because we need to be able to prototype and have an understanding of how the technologies are going to go together. (I06)

He also added that problem-solving was not just an individual exercise, and mentioned that some problem-solving is done within a team environment: “I’m usually able to get the answer within your own sphere so it will be like the guys like in the design team ... we’ll usually nut out a problem like that” (I06).

In discussing his views on the skill requirements of other professionals in the industry, one interviewee linked critical thinking to his ability to learn and solve problems:

The best thing that uni did for me was teaching me how to learn and a method of thinking and that was my Honours year that I learned that ... like I learnt PDP 11 assembler. I’ve never ever done PDP 11 assembler in my life, but the things that I learnt in that are relevant and it teaches you certain ways of thinking ... and you know I’ve got a Maths degree and I couldn’t solve a lot of differential equation to save myself now but I'm positive that the stuff that I did in that Maths degree is critical to what I do now and the methods of thinking, solving problems and coming up with solutions. (I02)

The comments from these interviewees would seem to support the arguments made in the literature, and in the various skill sets and frameworks, that problem-solving and critical thinking are not only an important skill to possess but they are also important as part of a
worker’s 21st century skill set. The interviewees clearly link problem-solving and critical-thinking skills, but also highlight their importance in terms of problem solving within the team, solving issues within project teams, and identifying programming and applications solutions. The skills set and frameworks were not silent on this, and link problem-solving with critical thinking and decision making (such as Binkley et al, 2010; Cheetham & Chivers, 2001; EnGauge, 2003; NCVER, 2003). For example, Binkley et al (2010) argue that these skills emphasise the upper end of thinking skills, and require a greater focus on review, reflection, analysis, discussion, and reaching a solution. The interview results would also seem to support the contention of some of the survey respondents who also felt that problem-solving, critical thinking and decision making were important skills needed by industry professionals. An example of their verbatim comments include “problem solving” (ID002, ID078, ID176), “critical thinking” (ID009, ID025, ID039, ID078, ID108), and “decision making skills” (ID031).

**Communication capabilities**

In analysing the interview transcripts, it became clear that most of the interviewees utilised some form of information translation skills in the process of communicating with clients, team members or management. As one interviewee suggested, in his role as director of the business, “my role is that of a translator so I talk to a client and go what do you want, they say this, and I go to the geeks and say that’s what they want” (I01). This comment would suggest an importance for the fundamental element of information translation into some form of outcome for either the business or the client. This interviewee went on to add that the skill of translating information was not just related to project work but also affected other people in the business:

*If you’re putting together an email, a newsletter for a client, it touches the account director, the account manager, the copy writer, the designer, the HTML creator, the*
proof reader ... you’ve touched ten people on one particular job ... it’s harder than what it used to be because you need to follow through otherwise you’ll find yourself out in the cold. (I01)

Three interviewees identified client communications as being an important part of their broader communication skill set when it came to transforming the client’s need into a solution. One interviewee suggested it was about managing the client expectations in their projects:

The project manager would talk to the client, manage their expectations ... if something needed to be done, like if they said I want this done, he’d push back on them and say well that’s not in this thing we agreed to do. (I02)

The graphic designer on the other hand, would offer the client a range of solutions, in her case a set of designs, based on the client’s verbal and/or written brief:

I need go to someone and get out of their head exactly what you need to come up with the job in the first single attempt because you might offer three solutions in the first briefings. I can’t just come and say ‘I'm going to draw one picture for you and you’ve got to buy this from me’ ... so you come up with three concepts and you hope and know what the brief’s about ... you need to know how to sit down and get stuff out of people ... you’ve got to know how to get that design and get what the client wants and change that to what they want ... that’s a skill set that you need to design it for them, I need to do what they want me to do. (I04)

Another interviewee suggested that idea creation was about balancing the client’s requirements with their offerings and solutions and collaboration skills:

You can come up with the best idea in the world but you’ve got to do it right ... I think a lot of the skills that I’ve exploited are professional speaking ... I’ve done years of key note speaking and panel speaking and professional speaking because sales is just
pitching ... you’ve got to know how to pitch and you also have to know how to manage people ... I’ve been doing that and worked well with people ... I mean it’s about collaboration. (I05)

In the games development sector, the idea of translating information was identified in terms of transforming a game from concept into reality. The lead games developer noted that his role in a project was to provide an overview and an objective of the game to the team of developers and programmers:

I’m the lead game designer, my role is primarily - this is an interesting one – is herding cats ... well primarily I set the tone for what the game is going to be. So that’s working out what features we need to deliver to deliver a particular experience to the end user. So as an example, we might be given a high level concept which is no more than a paragraph, then I need to figure out what features we need to actually develop to deliver on that and exactly how that is presented ... and then from there it’s communicating that to the rest of the team and then make sure the rest of the team is delivering on those. (I06)

Finally, the game play programmer mentioned that documentation was critical, not only in his role but also more widely in the games sector. He suggested that written skills and good documentation were important in the design and programming of games:

We go through quite a lot of documentation and I think no matter where you go you’re going to find there is a lot of documentation and you have to get that all straight to make sure you’re developing what you’re supposed to. (I07)

The importance of communication skills was identified and argued earlier in this section and in the survey findings. From these comments it would also seem that a number of interviewees utilise communication skills in a more meta-cognitive application, as part of the process of assessing clients and the situation, thought, activity planning, analysis, and actions.
It is apparent that industry professionals need to possess and develop what the Organisation for Economic Cooperation and Development (OECD, 2005) call relating well to others. The interviewees discussed this skill in terms of translating concept to reality, meeting client needs, managing client communication and client expectations, and aligning requirements between clients and programmers. In other parts of the literature (for example Cheetham & Chivers, 2001; Eraut, 2004), the idea of translating information is closely linked to the broader skill set of written and oral communications. These comments very clearly support the claims of a number of writers (for example Binkley et al, 2010; Cheetham & Chivers, 2001; NCVER, 2003) for the need of professionals to be able to communicate information either orally or in writing, working and collaborating in teams and being able to communicate ideas and information.

Knowing how to learn

In discussing their approaches to ongoing professional currency, three interviewees mentioned curiosity as a factor that affected their learning. One interviewee noted that his learning was driven by his curiosity in different tangential areas, not necessarily those related to the core business of the company:

You know look it’s different with every person ... I mean [names deleted] and myself talk a lot about science, a lot about futurism, a lot about the singularity, I'm kind of a geek on that stuff, physics. [Name deleted] and I tend to talk about government a lot. [Names deleted] and I talk a lot about the media, all forms of media. (I05)

The lead games developer suggested that learning, and having an understanding of other disciplines, adds to the enjoyment of the games for the user:

I read lot so cover a lot of titles so it’d be game design but also industrial design, graphic design, psychology, all that kind of stuff ... because a lot of what you do as a game designer is just tweaking other people’s understanding of what’s going on in
Quite clearly it would seem that for some professionals, curiosity is a key determinant of what they want to learn as part of their ongoing skill and professional strategy. In their ability to know how to learn, the interviewees suggested that factors such as motivation for ongoing learning and having a broad curiosity in other areas helped with new ideas. Having an interest in tangential and diverse fields may have some impact on their job and work functions. These comments seem to clearly support claims made in parts of the literature for the importance of workers in the 21st century to search for and synthesise information from a variety of sources, to identify new ideas, to be curious, to have knowledge of human cultures and the physical and natural world (see American Association of Colleges and Universities, 2007; EnGauge, 2003; Jenkins et al, 2006). It should also be noted that no survey respondents identified curiosity, or accessing other disciplines, as part of their learning or skill requirements. It could be speculated that the survey respondents felt these specific skills were not important or they did not think of them as being skills.

The previous section focused on expanding the key skills needed for professionals in the digital content industry. In analysing the interviews, five distinct meta-cognitive skills were reported: adaptability; transdisciplinarity; problem-solving, which included critical thinking and decision making; communication capabilities, which was a broader application of communication skills and being able to interpret information; and knowing how to learn. The meta-cognitive skills findings supported the arguments made in the literature that workers and learners need to consciously think about how they learn (learning to learn) and better develop their learning strategies and skills (metacognition) to engage in effective workplace learning, the types of skills that are critical for workers in the 21st century.
The next section focuses on the approaches discussed by the interviewees to their ongoing skill and professional development.

**Approaches to skill and professional development**

The responses and views offered in this section are aimed at addressing research question two of this study that is focused on the approaches to skill and professional development of workers in micro businesses in the digital content industry. In the course of conducting the literature review for this present study (see Billett, 2004; Cheetham & Chivers, 2001; McWilliam & Haukka, 2008; Pickard, 2007; Tak, 2008), a number of informal learning approaches were identified: books and manuals, blogs and wikis, online networking sites and forums, attending conferences, discussions with work colleagues, outside business contacts, and consulting with friends and relatives. Professionals in the digital content industry, it was found, also complete formal education and training as part of their ongoing skill and professional development.

From the interviews, a range of strategies and approaches were identified by the interviewees: face-to-face discussions, the use of various online technologies, self-directed learning, networking with others, social and personal relationships, mentoring programs, attending conferences, the use of books. Formal education and training was identified by survey respondents as a relevant approach to an individual’s skill and professional development, and this was also discussed by the interviewees.

**Formal education and training**

The interviewee’s referred heavily to formal education and training as an approach to their ongoing skill and professional development. In discussing their views of the role and application of formal education and training, three broad themes emerged: one set of comments suggested a qualification is a requirement for the job, another tract suggested that formal education and training did not actually meet the needs for the interviewee’s skill and
professional requirements, while a third set of comments indicated that it promoted their skill and professional development.

**Qualification is a requirement for the job**

The majority of interviewees felt that “having a qualification is important in the job ... it mightn’t be the creative brain qualification but the skill set to do it because if you don't have that technical learning, you would never know how to” (I04).

Three interviewees discussed the need to possess a formal qualification to be able to work in the industry. The general manager of the games studio was very positive, not only about the role of formal education and training in relation to skill currency but also about how having a qualification shows discipline. He summed up his views by saying:

*I think having a qualification is really important. Not so much from an information point of view but there's a strong correlation between people that have finished a course and the discipline and application ... completing a course shows me that they have a level of discipline to actually see something through.* (I08)

However, the development lead suggested that while a qualification is not necessarily needed in the job, having a qualification aided the recruitment process. He used qualifications as a way of filtering job applicants:

*When we’re filtering job applicants, a degree is a really easy way to filter someone.*

*While I don’t think the course work was appropriate to me or was going to help me get employed, I needed the qualification.* (I03)

These comments seem to support the contention of the survey results that suggested it was important to possess a formal qualification to work in the industry. It was reported in the survey findings that over nine in ten survey respondents held some form of formal qualification. In summary, then, some interviewees felt that having some form of
qualification was important for working in the industry as it also showed a discipline and application in completing the program.

*Does not meet their needs*

There were some interviewees who felt that formal education and training was not responsive enough to meet the changing nature of the industry, the material in the courses was considered dated and at times not relevant to the work or the job, and not responsive enough. As was suggested by this interviewee who felt that learning on-the-job would better serve a person’s skill and professional development:

*Pretty much every single person in there has dropped out of education to come and work because they’ve been that far advanced of what the tutor or what the course material is. I think [name deleted] is the only one who has got a degree in Economics and he’s working as a project manager but all the rest of them in there, they started on a design course or they’ve started on a either a Diploma or a Degree and have gone no, this just isn’t working. Also, the course materials, it takes a year to develop and it takes a year to roll out whereas things are changing on a daily basis. It's about on the job, certification doesn't have as much of a role in our industry as it used to.*

(I01)

Another interviewee added that he needed work experience rather than a qualification to ensure he worked in the industry:

*I did have trouble finishing my degree ... it was a science degree majoring in maths and computer science ...part of that was I didn’t see how it was going to help me be employed afterwards. After about two years I started working almost full time and finished the last year over a year and a half or so. I got the job without having the degree and I actively sought the job because I thought that was going to be more important than having the degree ... I needed the experience.* (I03)
However, the general manager of the games studio felt very differently when talking about the currency on course information and the relevance of completing a formal education and training program:

*The common complaint that students have is that the information is not current. But it doesn’t matter from my point of view you know the principles are always current and they’re really learning how to learn. You know I’ve never placed much credence in any of those arguments and I’ve proved to myself that people who graduate are usually better, and make better employees.* (I08)

He also suggested the relevance of course information was related to the deficiency in the curriculum renewal processes at tertiary institutions:

*One of the disadvantages that the universities have is it’s a very slow process as you know changing curriculum ... so it’s pretty much three years to actually go through the approval process and changing the curriculum and working it through the system itself.* (I08)

From these comments, it would seem that some form of qualification, or completing a formal education and training program, is useful and relevant, as some interviewees felt that having a qualification was critical to working in the industry; it signalled a discipline and commitment to the field of study, as well as aiding their ongoing professional development. Other interviewees also felt that formal education and training did not sufficiently meet the changing nature of the industry, that the courses were not reflective of the role and that workplace learning was a more applicable approach to their skill and professional development.

In discussing the relevance of having, or gaining, a formal qualification, several interviewees suggested that workplace experience was just as important. This was highlighted
by several comments about either the interviewee or their employees giving up on completing degrees and going straight into the workplace to gain valuable job experience.

Promotes skill and professional development

The interview analysis showed two interviewees had completed some form of formal education and training program in the previous month as part of their ongoing skill and professional development. In espousing her views on the relevance of completing a formal education and training program, the sole trader/owner of the graphic design business noted that she completed a professional short course to further develop her skills:

But there are lots of other web things I could have learnt but I chose Adobe Dreamweaver which is part of the creative suite obviously because I already know it. I did a course last year at Design College of Australia ... that’s why I did the course, I need to know that knowledge ... the Dreamweaver course was really about building my technical and software skills and better understanding of the web. (I04)

For the general manager of the games studio, completing a formal education and training course was aimed at better understanding the wider implications of talent management and production, as well as staying current in the games and entertainment sectors:

For instance I enrolled in a executive production course certificate course at Victoria University ... it was for film and television and I was very interested to see contractually how executive production varies between entertainment media ...I’ve done other courses around the digital media, using social media for marketing, and a variety of marketing related courses too ... I found that usually the best way to keep current is to do these courses and they are they tend to be very, very current in their information. (I08)
These results are inconsistent with the survey findings, where three out of four respondents had completed some form of formal education and training in the previous 12 month period.

**Online technologies**

The interviewees identified a number of online technologies that aided and assisted in their skill and professional development: social networking sites forums; news and aggregation sites; blogs; and other online approaches, which included email, web tutorials and podcasts.

**Networking sites**

The most discussed and mentioned approach used by the interviewees was the use of various types of online networking sites such as Facebook, twitter and LinkedIn. As the interviews progressed, it became quite evident that various online networking sites were used as part of their professional development, as was suggested by one interviewee:

> *Things like twitter and blogs, are indispensable for you ... I'm always looking for the next thing as well, whenever I read something interesting or relevant to my role or the business I tweet it.* (I01)

This statement points to what could be seen as a key approach to skill and professional development within the industry. The same interviewee suggested that the use of various forms of online networking sites was quite normal within the industry. He noted that “socially it’s more about actually following people and listening to what they’re saying” (I01). While another suggested that keeping tabs on certain people within an online networking site was a way of maintaining his industry and professional currency:

> *In particular twitter just for following people and keeping up to date with things, or even meet up where user groups are organised ... anyone who is in technology will use twitter over Facebook, but anyone who is not technical will probably use*
Facebook. Also for me personally, it's why I like something like twitter because you can just follow it passively. (I02)

The previous comment would suggest some form of passive learning, where the learner is selecting and sourcing information on a just-in-time basis. This will be further explored and discussed in a later chapter, but it adds further weight to the argument that professionals in micro businesses need to engage in some form of just-in-time mode of informal learning in order to promote their professional currency.

This response from one interviewee indicates a level of acceptance and use of networking sites as an approach to learning and skill and professional development within the various sectors of the industry, and that the various social networking sites are good for some types of information and knowledge but not for others:

*I'm just a voracious learner ... I post voraciously on all the platforms but it's not because you know I just want to show off, it's because I read everything. I want to know what's going on and I want to hear what other experts in my field think. So there's probably a dozen people that I will immediately go to every morning and see what they're saying. And I learn from them, I don't see these guys all the time and it's a way for me to stay current or stay ahead you know.* (I05)

In contrast, there were several interviewees who felt that the use of online networking sites were not particularly helpful for them. The comment offered by the sole trader/owner of the graphic design business suggested that she did not use them, nor did she see any value in them as a professional development tool:

*No I don't find twitter or Facebook helpful. What's beginning to annoy me is there are some people I work with or have dealing with you know I'm in their email database and they want me on their Facebook list ...and much as Facebook it's...*
becoming a brilliant thing, I don’t think it’s really that brilliant when it comes to the workings of a company. (I04)

These particular comments would seem to be in contrast to what was reported in the survey findings, and also to the suggestions made within the literature on the value of online technologies in terms of learning and education. The use and access of various online technologies for the purposes of collaboration, learning and knowledge sharing is argued by a number of writers (for example Dabbagh & Kitsantas, 2012; Dabbagh & Rea, 2011b; Dutton, 2008; McWilliam & Haukka, 2008). They argue that various online technologies are reshaping learning as a two-way process, where learners can access and use an array of tools and information sources to create their own learning pathways. In fact the view offered by the chief technological officer is supported by Deng & Yuen (2011), who argue that people can learn just from reading and commenting on blogs, while also supporting the notion of collaborative learning. This was shown to be the case based on the responses from the interviews conducted where, like the survey respondents, the interviewees identified quite strongly with the use of, and access to, online technologies. In particular, accessing online networking sites such as Facebook, LinkedIn and twitter would seem to support the assertions made by writers in this field. Based on the interview data and sections of the survey findings, it could be inferred that the use of online networking sites is an important approach for many industry professional’s skill and professional development, and it adds further weight to the argument that professionals operate in a just-in-time mode of skill development, and it would appear to be quite widely used by industry professionals in the various sectors.

Forums and news aggregation sites

Another approach that figured prominently in the interview responses was the use of forums and news aggregation sites for their ongoing professional currency. Several news and aggregation sites were mentioned in the course of conducting the interviews, and,
overwhelmingly, a majority of interviewees saw it as an essential tool in their ongoing skill and professional development. Typically, aggregation sites serve as a central resource and media outlet for a particular sector within the industry, with particular regards to professionals. The sites typically feature news, articles, forums, job listings, product reviews, book reviews and regular columns. They might also contain tutorials for hobbyists and professionals.

The director of the digital marketing business reflected on his extensive use and daily access to news, magazine and aggregation sites:

*I read a lot online. I have technology sites which I check out and subscribe to globally. So every day I’ll go through and have a look and see what Wired is saying. I go through every day and see what the Gadget is saying. I was on Gadget this morning and there was an article that Google had just released a brand new way of tracking ads which is more closely related to the way television is tracked ... even locally I look at Delimiter that’s a local technology magazine and website. (I01)*

While the development lead at the apps development business suggested he used these types of sites to filter news relevant to his work:

*I’m kind of filtering news that’s happened over the last month. So the places I go for, links get posted there and I see that. Others are sites like Readit, it’s a bit like forums but very different sort of sub-forums where they have for difficult technologies they have different sub-forums. I know people who are quite active in trying to teach people better ways of doing programming they introduced me to a lot of things. One guy publishes exercises and interesting articles and posts, so working through that has been useful so making personal contact with people who are better at stuff than I am. (I03)*
The responses given by the interviewees show the breadth and range of online forums, news and aggregation sites, and demonstrate the varied use and application of these sites in relation to the individual’s particular skill and professional requirements, being used for updated news, articles and to filter relevant information. Interviewees pointed to the value of online forums and news sites in terms of being able to filter news and current information, and access to quick information from online forums and news aggregators was crucial in staying current. Online forums and, to a lesser extent, news and information sites were identified in the literature as an avenue for informal learning and, indeed, as part of an individual’s online personal learning network (McWilliam & Haukka, 2008; Dabbagh & Kitsantas, 2012). It can also be noted that in the survey question designed to identify the importance of various informal learning approaches, blogs, wikis and online forums were rated by the respondents as being the second most important/important informal learning approach. However, some caution should be read into the survey result as it is unclear, without the opportunity to expand on this particular finding, which of the three approaches the survey respondents were rating as important or very important. This may become apparent in the next section, which deals with blogs and wikis.

**Blogs and wikis**

It was reported in the survey findings that blogs and wikis were a source of learning for a majority of respondents. However, in contrast to the survey findings where more than nine in ten respondents identified blogs, wikis and online forums as being important or very important, blogs were discussed by only three interviewees. One interviewee suggested that blogs were not used widely:

*Back when I was still a developer blogs were the big thing, I mean nobody writes blogs anymore but they were the big thing and you’d follow someone’s RSS feed and you’d aggregate it and you’d read stuff and you’d go to a few sites.* (I02)
However, two other interviewees did use blogs as an approach to their skill and professional development. In conjunction with other online resources, one interviewee noted “I have technology blogs which I check out globally they’re indispensable” (I01). Of further note, no interviewees mentioned or discussed wikis as an approach to their skill and professional development. This finding would seem to be inconsistent with the survey findings where it was reported that blogs, wikis and online forums were the second most important informal learning approach. This could lead to the suggestion that advances in technology and online media, and the large scale use, particularly of online networking sites, have made other online technologies, such as RSS feeds and, to a lesser extent, blogs and wikis, redundant. As the chief technological officer from the apps development business suggested, there are not many developer-related blogs, and he would rather source the information through some other online resource. However, some writers (for example Beck & Wade, 2006; Dabbagh & Kitsantas, 2012; Dziuban, Moskal, & Hartman, 2005; Robertson, 2011) suggest that using online technologies and communicating through them via online forums is, for some people, simply living, and as forums are quite heavily used in today’s online technologies, they could be considered to be a vital resource for a person’s ongoing skill and professional development. In light of this, writers such as Dabbagh & Kitsantas (2012) and Siemens (2005) argue that educators need to value and understand the extent to which these new forms of online and communication technologies are changing when and how people learn, as well as who they learn from. Deng & Yuen (2011) and Robertson (2011) add that blogs offer the learner a convenient way to produce and share reflective learning as well as offering collaborative learning opportunities through the wider learning community. Robertson (2011) suggests that blogs greatly assist self-directed learning goals of the learner, provide new opportunities for them to manage their own learning and facilitate collaborative ways of active learning.
Other online approaches

Several other online/digital approaches were discussed by some interviewees. These included the use of email, online/on-demand video, podcasts and audio books, and online tutorials.

The use of email was reported in the survey findings to be used mainly in interacting with work colleagues, and with friends and relatives. Generally speaking the interviewees did not see it as a very useful tool in terms of their skill and professional development, as one interviewee commented:

email is not at all useful for PD. The only thing I’d use email for is for business when other people are contacting me usually, or if I need to send out a broadcast to the organisation. We use email to coordinate, but I see it a business toll mainly. (I03)

Another interviewee added weight to the argument that email was used to a lesser extent as a tool in his professional development and suggested other approaches that best served his needs:

I use email lists to a lesser extent mainly because they’ve been superseded by other things. But if you had of asked me that question five or even ten years ago I would have said email as a number one. (I02)

However, one interviewee suggested that for him email was a useful tool for sharing ideas and that it was quite generally used within the games sector:

I use Gmail a lot. It seems to be pretty useful for sharing ideas, like creating a document and sharing it with someone to have a look at, although we actually use it internally here as well, so it's good technology. But for sharing documents as much as I hate documents they're kind of our tool to the trade for design. (I06)

These findings seem inconsistent with the survey findings, where it was found that email was widely used as a tool for skill and professional development. It was reported in the
survey results that email was used mainly to share information and knowledge with respect to business, software knowledge, technical skills development, and web designs and development. It could be speculated that the survey respondents felt that email afforded them quicker access to their business and personal contacts, or that email was indeed an important tool for their ongoing professional currency. The survey results were highlighted by the fact that email was the second most utilised approach for interacting with work colleagues, and friends and relatives (n=170, 92.4% and n=38, 20.7% respectively), while email was the fourth most used approach (n=140, 76.1%) for interacting with other industry professionals. However, the interview findings suggest that despite the heavy and frequent use of email reported by the survey respondents, it could, as was suggested by one interviewee, be seen mainly as a business tool, or that sharing ideas through email has been superseded by advances in, and access to, other forms of online technology, such as news aggregation sites, forums and networking sites. This finding is contrasted by Dabbagh & Kitsantas (2012), who argues that email is an essential tool connecting individuals. In describing how online media can connect individuals and aid learning, Dabbagh & Kitsantas (2012) claim that email is very useful for managing and supporting the exchange of information and knowledge, as well as for fostering informal learning, cooperation and interaction. From this, it would appear that email plays some role in what could be termed as ‘situational’, where the individual utilises email on a needs basis, as it relates to their skill professional development requirements. This can be seen from the findings of this study and parts of the literature. According to the interviewees, email is best used for sharing documents within the business and for the purposes of business communication. However, the survey respondents felt that it was an important tool for enabling them to interact with their business and personal contacts. Dabbagh & Kitsantas (2012) and Haythornthwaite (2000) suggest that email is an important tool for frequent and multiple interactions.
In discussing their approaches to skill and professional development, two interviewees reflected on the use of podcasts and audio books:

*Every day on my drive to work I listen to podcasts, that’s my daily routine as like I say, checking the news, listening to podcasts, recording news on my DVR ... because I only want to listen to certain things, and it’s more pooling for us, such as information download for want of a better word.* (I01)

*I use audio books because I drive up from the Gold Coast each day ... that’s an hour in the car and I can listen to the books, on business management and development. I probably subscribe to you know at least a dozen different podcasts they're an incredibly useful source of information ... all kinds of personal development and business stuff, the Harvard Business Review does a fantastic series, also psychology, a lot of what we do now in games involves a lot of consumer behaviour analysis as well.* (I08)

Online tutorials, which was identified as a feature of some forums and news aggregation sites was discussed by one interviewee, who suggested it related directly to learning as part of his job:

*Quite often I look for tutorials specific to learning a new language ...like one of the ones we've identified as possibilities is Scala so I'll look online and see how that works. The tutorials try to fill in those gaps particularly for learning new languages and environments it’s like a good constant source. If you can find a good tutorial or a good set of tutorials, you can work through them, you can pick things up quite easily, you can like sometimes people post back questions they had about the tutorials that might be relevant.* (I07)
Finally, on-demand video and online videos were identified by the sole trader/owner of the graphic design business. She found them as being particularly helpful in her learning:

*On demand video which is what Adobe will offer like CS6 suite ... they'll have things to watch, what's new and newly available ... and on YouTube it comes up with a video and I use the on-demand from Adobe all the time ... different people will do their own little, here’s how you do this with the form. But then they’ll offer one hour classes and it might be how you will convert your design to a web page in one hour. So you’ll look...click on it, link...yeah I love it. It’s fantastic. (I04)*

The responses and comments provided by these interviewees would suggest that accessing and utilising various forms of online technology or other digital forms, such as online networking sites, news and aggregation sites, forums, online tutorials, and email, as an approach to improving skill and professional development are important tools for learning. As Dabbagh & Reo (2011b), Dabbagh & Kitsantas (2012), Robertson (2011), and Siemens (2005) argue that email, blogs, wikis and other online technologies provide the learner with a wide selection of tools and information sources for creating their own learning pathways. Quite clearly, then, it could be suggested that industry professionals prefer to access some form of online resource as part of their ongoing skill and professional development.

**Face-to-face discussions**

When asked about the approaches undertaken to their skill and professional development in the past month, several interviewees reflected on the fact that they had engaged in face-to-face meetings, discussions and planned group meetings of like minded individuals within their sector of the industry.

The development lead from the apps development business reflected on how informal face-to-face meetings and user group meetings had aided his professional development in terms of knowledge transfer:
I involve myself quite heavily in a number of local user groups as a co-organiser and I run a bit of a session there where I talk about the current happenings in that particular community. That's good for me because I spend time doing research into what's happening but also I sort of facilitate the session and other people talk about what's going on as well so it helps me to sort of pick up and learn those kinds of things. So without having those, without being involved in those groups or those things I would never have seen that ... the knowledge transfer that happens through those groups is really good. (103)

A significant response was offered by the director of the online marketing and communications business who suggested that despite having access to all types of digital communications and media, he felt that having a face-to-face conversation was critical to maintaining connections:

I'll still get on planes I'm going to London next week and I'm in Sydney twice a month and I'm in Melbourne once a month and I'm in LA three times a year. You have to do that I don't care how sophisticated social digital media technology becomes you don't get your true connection with somebody unless you're there with them. (105)

Further into the interview, when discussing approaches that had not worked for him, the director of the online communications business indicated that he understood the value of technologies such as Skype and video chat as a form of face-to-face communication, but disliked them, and, in fact, suggested that this type of technology may have contributed to notions of being less connected:

I hate Skype, I get it I think it's really important because you save money and international and all that stuff but I just can't stand it ... people always say you know we'll do a Skype call I'm like what's wrong with the phone or a face-to-face meeting ... I understand a lot of guys just spend their whole day at their computer, blogging and
all that stuff and it’s easier for them ... for me the more technology grows the more
connected we feel the less connected we actually are. (I05)

Quite clearly the idea of face-to-face discussions emerged as a common theme in
many of the interviews. It is argued that at the heart of informal learning is face-to-face
meetings, discussions and casual conversation (see Dale & Bell, 1999; Eraut & Hirsch, 2007;
learning can be promoted by such everyday activities as conversations and discussions related
to a person’s work function. For many of the interviewees in this study, face-to-face
discussion with work colleagues and other industry professionals was considered an
important approach in maintaining their skill and professional currency, in terms of sharing
and/or sourcing information and knowledge with like-minded people who are directly related
to their sector of the industry. Similarly, the survey respondents felt that face-to-face
meetings were an important approach to their informal learning. The survey findings reported
quite clearly that regardless of type of information sourced or shared, face-to-face
interactions with work colleagues, other industry professionals, or with friends and relatives,
further reinforced the views offered in the literature that it is an important part of informal
learning.

Relationships and networking

In the broader field of workplace related learning it has been suggested that learning
occurs in three broad areas: internally in the business, external to the business where
employees have a strong orientation to their professional field, and in social and personal
relationships (Billett, 2001; Nonaka & Takeuchi, 1995; Poell et al, 2000; Raffo et al, 2000;
Skerlavaj et al, 2008). The literature review identifies various approaches as to how adult
learners may undertake some form of informal learning, and three key approaches emerge:
the social network, communities of practice, and learning networks (see Cross, Parker, Prusak, & Borgatti, 2001; Dawson, 2008; Lave & Wenger 1991; Van der Krogt, 1998).

Business relationships

Several interviewees identified the role of business relationships in their ongoing skill and professional development. They referred to the value of staying connected with people in the industry. In analysing the interview transcripts, responses from two interviewees stood out as being the most representative of how and why their business relationships contributed to their ongoing professional currency:

*The business relationships I think is the only way, maybe it’s the most effective way to learn things. I think in technology you’ve got to be always keeping up with things and what’s going on and you don’t want to spend ten hours a day trawling stuff and nobody has time to do that ... so keeping up with things is important.* (I02)

The other interviewee was quite adamant on the role that business relationships, collaboration and networking play in an individual’s skill and professional development:

*I call myself a connector, a networker if you will. I’ll still get on planes you know I mean you don’t get your true connection with somebody unless you’re there with them ... so it’s nice to have that relationship and on the networking side you have to, you have to be out there ... it’s about collaboration.* (I05)

An interviewee from the games studio discussed how the business relationships and the contacts he has made within the industry has helped in his learning and developing his networks in the industry:

*I’d say my various contacts and relationships have helped my learning quite a lot. I mean when it came to my studies at QUT I got to know a lot of the lecturers well and building that relationship helped a lot. I could very easily approach people and in the end it turned around that they were able to start recommending me for things as well.*
And coming through those recommendations I got to know some of the people in the industry ... it certainly does not hurt to have built some kind of relationship. (I07)

Social and personal relationships

The analysis of the interview transcripts shows that social and personal relationships play a large role in ongoing skill and professional development. The majority of interviewees identified that their social and personal relationships were an important source for their ongoing professional currency. The comments offered by the interviewees centred on learning, sharing knowledge, problem solving with like minded professionals, and, more broadly, maintaining their currency within their sector of the industry. One interviewee talked about the role of his business and personal relationships in terms of their shared common interest in his professional life:

Social relationships are very important, very important. But having said that it started with me being friends with a lot of like minded people that I worked with. I have a very interesting career in that a lot of the guys that I grew up with are now leading lights just and that was working with them whatever, but we became good friends, real friends. So there is social to me is different than friendship and my friends and I and my social network and I share a lot. (I05)

Another interviewee suggested that social relationships were an excellent source of information for him:

Social relationships are extremely important I mean by far, well there’s two areas really. Information, information about trends and fashions and new technologies you know ... our industry is really at the convergence of technology on the one hand and entertainment on the other ... so both of those are incredibly volatile ... so I definitely want to keep current with trends. (I08)
These comments appear to be in contrast to the survey findings, which showed that personal relationships were not as relevant or important as business relationships as an approach to informal learning. The importance and relevance of business relationships, and social and personal relationships, were very clear during the interviews, as the above quotes would indicate. The interviewees pointed strongly to the fact that their various business and/or social and personal relationships yielded knowledge, an excellent source of information that built up their understanding of their sector of the industry as well as enhancing and furthering the development of their skills and professional currency. The interview findings add further weight to the claims made in the literature of the value of engaging in business and social relationships. Cheetham & Chivers (2001) and Tak (2008) contend that professionals resort to interacting with their professionally-based support networks in order to keep abreast of new technologies and work practices, and network and collaborate with others as part of their learning, while Lave & Wenger (1991) argue that learning can be enacted through a person’s broader social relationships to update and refresh their industry and professional skills.

**Self-directed learning**

Another theme that emerged from the interviews as an approach to informal learning was the idea of workplace and self-directed learning. The interviewees referred heavily to their individual approaches and reasons for self-directed learning. A quote offered by one interviewee showed the alignment between self-directed learning and his ongoing learning, which was a common thread in several interviews: “for me to be able to just in my down time be learning and be exposed to current events in our industry is so important” (I01).

When considering the approaches undertaken to their skill and professional development, several interviewees reflected more broadly on the need to undertake some form of self-directed learning or to engage in workplace learning. A number of interviewees
discussed their need for ongoing learning as being linked to their job and work requirements. A comment offered by one interviewee pointed to the fact that his skill development was about his need for continual learning:

But it’s essential that you’re doing continual learning and improving of your own skills ... I mean being in a small company at the moment and being so close to everything that’s going on is a good environment to learn from already ... there are certainly things we all learn from each other. (I03)

Another area of self-directed and workplace learning that was identified during the analysis of the interviews was the different reasons and outcomes that self-directed learning presented, such as personal interests, for this interviewee:

But in an ideal world I suppose, I would personally like to read more about leadership and how to lead teams and to learn more business stuff ... it may also be personal interest, like I have a personal interest in functional programming and in particular using JVM and I will read articles. (I02)

An interviewee from the games studio reflected on how actually playing other games was an approach that helped him develop a better understanding of game design:

But playing games is another really important one ... because you're understanding of what's come before will help to inform what's coming up ... you really need to understand how mechanics work and it's one thing to read it on paper, it's another thing to actually experience it and see why those numbers are actually triggering certain emotional responses in the end. (I06)

Another interviewee from the games studio identified that, for him, self-directed learning was about indentifying gaps and finding ways to fill those gaps to further develop his knowledge:
Well one of the things I have often done is think about the areas you need to develop in and you identify gaps in that knowledge and so I'll often you know do some research on line, look for tutorials online that sort of thing. (I07)

The idea of self-directed learning was best articulated by the general manager of the games studio. He suggested that an individual’s learning (in his studio) was more about the development of generic skills (as was identified in the literature and the survey findings) as opposed to the technical skills required by his staff:

So typically their continuing education is not technical in nature, they look after their own technical development, but typically it's more about management development.

So things like leadership, communication skills, developing a team, all those soft skills are things that typically engineers don't come inbuilt with. (I08)

The area of self-directed learning was identified by the survey respondents as another approach to informal learning. The survey findings showed that 21.7% (n=20) of respondents engaged in self-directed and workplace learning. Like other workplace learning studies (such as Boud & Middleton 2003; Cheetham & Chivers 2001; Daley 1999; Fuller, Hodkinson, Hodkinson, & Unwin, 2005), this phase, and indeed the survey phase, of the study found that industry professionals engaged in some form of self-directed and/or workplace learning. All the studies show that informal learning is often self-directed and involves learning along the way. They conclude that learning at work is a significant part of learning undertaken by adults. For example, some of the interviewees from this study cited reasons for undertaking some form of self-directed learning, such as the importance of self-determined learning and taking charge of their own learning, the lack of time to engage in a formal education and training program, and the ability to learn on the job. The interview findings add to the suggestion that self-directed learning afforded professionals with the flexibility and freedom for learning, it further promoted self-managed learning and professional development, and
also strengthened the basis of this present study that people working in micro businesses must engage in approaches, such as self-directed and self-managed learning, to maintain their currency in the industry.

**Conferences**

A number of interviewees identified that attending conferences and other industry events aided their ongoing skill and professional development. The interviewees who discussed attending conferences and other industry events, suggested that they were great opportunities for learning new things, to see what’s new in the industry, to network with other professionals, and to listen to guest speakers:

*There are conferences like this one called YOW ... there are more general technical conferences and there’s not specific things that you’d get out of that but it’s more a you know eyes open, expand your horizons, networking ... so sending someone to WWDC is really good as it will help them and they will learn things.* (I02)

However, two interviewees felt that conferences were a waste of time and argued that they added no value to those who attended them, as was suggested by this interviewee:

*For me I find that conferences can be a big waste of time ... there’s a lot of industry events and conferences and stuff that go on that they either have the wrong speakers or they don’t describe the topic well, especially the geek ones where you go along and there’s some developer at the front of the room trying to explain stuff and they just can’t.* (I01)

The interview transcripts showed some reasoning between the value of attending conferences and why some interviewees considered them not to be very useful. One interviewee agreed that they were an essential networking opportunity: “a lot of those things it’s more about being seen at them and saying you’re going to them than actually getting anything of value out of them” (I01).
The interviewees offered some varying views on the value of attending conferences as an approach to an individual’s ongoing professional development. The survey findings showed that nine of the ten respondents felt conferences were important/very important as an informal learning approach. However, as has been shown from the interview data, conferences for these interviewees were seen by some as being an excellent opportunity to learn from, and to network with, other industry professionals, while other interviewees felt that conferences added no value to those who attended them. During the course of reviewing the literature, and during the survey phase of this present study, it was identified that attending conferences or special events were an important informal learning approach. In his study of professional development and learning for IT workers, Tak (2008) reports that attending events such as conferences was a social approach that could play a role in the development of an individual’s skills. Those interviewees who discussed attending conferences or industry events indicated that such meetings not only assisted greatly with skills and professional currency within their sector of the industry, but they identified them as a socially-mediated networked learning approach. However, other interviewees identified issues such as conference structure and themes as being problems, or that the event was time consuming, or they added no or little value to their professional development. This contrasts with other studies (such as Boud & Middleton 2003; Cheetham & Chivers 2001; Tak, 2008) that argue for conferences and trade events as being valid informal learning approaches.

**Books**

The use of books was the least mentioned in the interviews. It is worthwhile noting that most of the comments about the use of books were made by two interviewees. They both identified that books, for them, were an excellent static resources, particularly related to their skills and the design process:
I read a lot of books that cover a lot of titles so it'd be game design but also industrial design, graphic design, psychology, all that kind of stuff ... a lot of what you do as a game designer is just tweaking other people’s understanding of what’s going on in front of them. So you need to find ways to do that through an interface which is all on the screen ... just because it’s game design doesn’t mean it doesn’t share ideas or concepts with industrial or mechanical or graphic design ... as a designer what you’re doing is trying to align a series of components together in a way that communicates an idea to an end user. (106)

As was the case in the survey findings, books were not considered an important informal learning approach. The survey data showed books were one of the least important informal learning approaches identified by the respondents (67% of respondents reported books as being important/very important). However, while not considered one of the most relevant informal learning approaches, the interviewees who referred to the use of books pointed out that they were an excellent reference source for previous designs and they provided direction in terms of programming and source code. This finding is supported by the claims made by Tak (2008), whose study of how IT professionals learn found that they would typically access books to identify source codes and reference other programmers and programmes. From these findings it could be suggested that, given the nature of the work of digital content professionals, which typically involves regular access to computers and the internet, as has been shown by the survey and interview data, industry professionals prefer, and clearly value, some form of online resource. However, as has been alluded to by some interviewees and from Tak’s (2008) study, books do have a place as a static reference and source to aid their ongoing skill and professional development.
Summary

The interview findings strongly reflect those skills that are discussed in the literature that were identified as being important for individuals working in highly technological and innovative environments, as well as those reported in the survey phase of this present study. The interviewees’ responses indicate the need for continual construction and demolition of knowledge structures, but also point to a fast meta-cognitive critical capacity to select where and how to learn, how to be able to filter information for credibility, and how to synthesise it with existing knowledge. The interview findings also show that a majority of interviewees attempted to maintain their professional currency by keeping pace with change and by remaining well-informed about emerging trends within the industry. The interviewees highlighted the fact that industry associations, in particular AIMIA, could do more to better promote the industry and education for professionals.

In addressing the second research question, which focused on the approaches taken to their skill and professional development, a wide variety of approaches were discussed by the interviewees. The interviewees discussed their views on formal education and training. Some interviewees felt that having and/or gaining a formal qualification was relevant and important to work in the industry and gave some indication of strong commitment to their career. Another set of interviewees felt that formal education and training did not actually assist in their job due to outdated course materials or relevance to the job, while two interviewees had completed a formal education and training program in the previous month. It was also reported that all of the interviewees held some form of qualification.

In this study, the interviewees largely preferred to employ social informal learning strategies. While a few interviewees reported using other forms of online technologies, or engaged in other forms of individual learning, the vast majority of the informal learning approaches employed by the interviewees relied on their business and social relationships.
primarily, in either face-to-face or online modes. As such, there were four informal learning approaches that garnered the most comments from the interviewees: face-to-face discussions; accessing online networking sites; accessing business, social and personal relationships; and self-directed learning. The interviewees discussed the fact that online networking sites were excellent sources for gathering and sharing knowledge, for being able to connect and interact with other industry professionals, and for staying up-to-date with current events and changes within the industry.

All the interviewees in this study reflected strongly on the use and role their business and social relationships played in their skill and professional development. This suggests that social and networked learning approaches are very important for industry professionals as part of their development. Those who discussed their business relationships felt them to be important for staying connected with people in the industry, as a source of learning, useful in collaboration, and as a source for developing industry knowledge. The interview analysis also showed that a large number of interviewees accessed their personal contacts and relationships to progress their professional currency. These results added to the suggestion that industry professionals engage in some form of social and networked learning.

The chapter concluded by discussing the interviewees’ views on their need to undertake self-directed and workplace learning. Interviewees felt that it was driven by their ongoing job and work requirements, used to fill an identified skill gap, or was source for further learning. The interviewees also identified other informal learning approaches and discussed the use of online forums, online news aggregation sites, podcasts and email, attending conferences and industry events and, to a lesser extent, blogs and wikis, and books.

In summation, social and networked learning approaches are important for industry professionals in their ongoing development. A range of online technologies is used for current, up-to-date and just-in-time information and knowledge, and formal education and
training has a key role to play in their ongoing professional currency. However, the use of outdated material was seen by interviewees as a shortcoming of university education, which is inadequate as preparation for work in the industry.

The next chapter focuses on the second part of the interview phase and addresses research questions three and four by discussing and documenting the role and application of the informal learning networks of the interviewees from this study.
Chapter 6

Learning networks

Introduction
This chapter reports on the interview data gathered in relation to the interviewees’ learning networks. The data gathered as part of this phase of the study involved the qualitative interviewing of a variety of professionals from within the digital content industry. The first section describes and summarises some approaches to network mapping and the approach that was employed in documenting the learning networks. The chapter then continues by summarising the literature that provided the basis for describing the network typologies of the interviewees, in terms of learning networks. The chapter concludes by describing and documenting the learning networks of each of the interviewees in this study in terms of their relationship-based networks. The intention of the interview questions related to this part of the study was to address research questions three and four: what is the role of informal learning networks in the skill and professional development of digital content workers?; and how do these informal learning networks operate? The outcomes of the network mapping questions are discussed during the analysis and synthesis of the network diagrams in this chapter.

Approach and method

As was described in the previous chapter, each interview was recorded, transcribed and analysed to identify the information (such as the individuals in the network, the frequency of the interaction and the methods/s of interaction) needed to document each individual’s learning network. Using a semi-structured interviewing approach, a series of network mapping questions were included as part of the wider set of interview questions based on the key themes and topics from the literature. The questions developed for the
interviews were aimed at drawing out as much information as possible from the interviewees of how their various business, social and personal contacts and relationships have contributed to their ongoing professional development. Questions that were asked during the interview, in order to be able to document the respective networks, related to what information was gathered or shared, and with whom; what method/s of interaction were used; and the frequency of the interaction. The interview questions can be found at Appendix 5.

As part of the interview data analysis and in order to best address the two research questions that focused on informal learning networks, it was determined that two network mapping templates would be used to describe and depict the learning networks of the interviewees, using a combination of network mapping sources.

**Network mapping**

Several sources were used in determining the best approach to document and visualise the interviewees’ learning networks (such as Conway & Steward, 1998; Haythornthwaite, 2000; Hogan, Carrasco & Wellman, 2007; Van der Gaag & Webber, 2008). It is argued that documenting these networks can aid in identifying the people, types of interactions and communications, flow of information, and intensity of the relationships or strength of tie (Granovetter, 1985). In documenting the learning networks of the interviewees, two factors became apparent, which were taken into consideration when developing the network mapping templates: the variables and methods of network depiction, and the relevance and characteristics of networks as they related to the literature.

**Mapping variables**

In describing their views on the components for network mapping, Conway & Steward (1998) identify the individual (or actor) as the most basic fundamental unit of identification, and argued that attention should be paid to the relationship of individual ties. In terms of links or ties between individuals, Conway & Steward (1998) discuss several
factors that are crucial in better understanding the network: relationship type, intensity and flow of the information. In the process of developing, coding and documenting the interviewees’ learning networks, a combination of approaches, identified in the course of the review of literature, was used. Table 36 below provides a summary description of the network configuration variables used in the visual representation of the learning networks.

**Table 36: Summary of network mapping variables**

<table>
<thead>
<tr>
<th>Network variable</th>
<th>Definition</th>
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<tbody>
<tr>
<td><strong>Network mapping template</strong></td>
<td>• The key to making a network map as an illustrative device is to design a graphic convention using a network mapping convention (Conway &amp; Steward, 1998)</td>
</tr>
<tr>
<td></td>
<td>• The composition of a person’s network data is shown as a set of variables in a diagram (McCarty, Molina, Aguliar &amp; Rota, 2007)</td>
</tr>
<tr>
<td><strong>Network members</strong></td>
<td>• The actors in a network may be individuals, groups, organisations, or a community (Conway &amp; Steward, 1998)</td>
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<td></td>
<td>• Name generation is where the individual is asked to free recall the names of the people they have interacted with (Hogan et al, 2007)</td>
</tr>
<tr>
<td></td>
<td>• The study of person’s network involves acquiring a list of a person’s network members (McCarty et al, 2007)</td>
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<tr>
<td><strong>Information shared</strong></td>
<td>• Transaction content as the between actors which emphasises that something is being exchanged or is passing through a relationship (Conway &amp; Steward, 1998)</td>
</tr>
<tr>
<td></td>
<td>• Information, knowledge and resources shared between people in a network (Dirksen, Huizing &amp; Smit, 2010)</td>
</tr>
<tr>
<td><strong>Intensity of relationship</strong></td>
<td>• The intensity or strength of a link is indicated by the frequency of interaction and flow of the information is either low, medium or high (Conway &amp; Steward, 1998)</td>
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<td></td>
<td>• Weak ties involve monthly or longer communications, medium ties two to three times per week, and strong ties involve daily communication (Haythornwaite, 2000)</td>
</tr>
<tr>
<td><strong>Flow of information</strong></td>
<td>• The reciprocity or symmetry of a relationship refers to the flow of information between two actors is either asymmetric or one-way, or symmetric or bilateral, where the flow is two-way (Conway &amp; Steward, 1998)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Network variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of measurement</td>
<td>• Over a 16-month research period interviews were conducted (Dirksen et al, 2010)</td>
</tr>
<tr>
<td></td>
<td>• Interviews were conducted over a two year period in several European countries (McCarty et al, 2007)</td>
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<tr>
<td></td>
<td>• The interviewees were asked about their social network interactions in the previous week (Hogan et al, 2011; Van der Gaag &amp; Webber, 2008)</td>
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<tr>
<td></td>
<td>• In the process of interviewing and documenting the people in learning networks a one month timeframe was used (Skerlavaj, Dimovski, &amp; Mrvar, 2008)</td>
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</table>

Given the variety of approaches, it was determined that two network diagram templates would be developed and used to best represent each of the interviewee’s learning networks in order to provide different perspectives of their respective networks. The first network diagram template focused on the information that is shared within an individual’s network by using symbols to show who they interacted with, lines of varying thickness to depict the intensity of relationships, and the method used to interact with that individual or group. The second network diagram template focused on the relationship an individual had with people or groups within their network, and used symbols to show the information that was exchanged, as well as lines of varying thickness to denote the level of intensity and the method of interaction.

In terms of period of measurement for the network mapping questions, it was decided that a one month time frame would generate the widest possible list and names of individuals within the respective networks. The second determination made in relation to developing the network mapping approach was in terms of showing the intensity of the relationship. It was felt that the descriptions offered by Conway & Steward (1998) and Haythornthwaite (2000) provided the best indication of terminology and intensity of the relationship. It was decided that a combination of the two approaches be used: low – monthly or longer interaction/s;
medium – one to two three times per week; and high – daily communication. The flow of the information within the network diagrams are denoted by the use of arrows.

The interviewees’ network diagrams were documented based on the responses gathered from the interviews, then transferred and coded into Microsoft PowerPoint using the variables described earlier. A summary of the network mapping variables and the two network mapping templates were provided earlier in Figures 2 to 5 in Chapter three, on pages 132 to 134.

Network typologies

This section of the chapter provides a brief summary and description of the relevant learning network theories and typologies that were used to describe interviewees’ learning networks. It is worth reviewing, then, how several of the relevant network theories and typologies were described in the literature (for example Bessant & Tsekouras, 2001; Haythornthwaite, 2000; Lave & Wenger, 1991). In the course of the interview analysis it became apparent that the interviewees had identified a broad range of approaches, interactions, information, knowledge and topics related to their ongoing professional currency.

A range of learning networks was identified in the course of interview transcript analysis. Each of the different network diagrams was documented using the network diagram templates described earlier, and then described by using a combination of the learning and network theories and typologies that were identified in the course of the literature review (such as Bessant & Tsekouras, 2001; Haythornthwaite, 2000; Poell, Chivers, Van der Krogt & Wildermeersch, 2000; Wenger, 1999). Table 37 below provides a summary of the relevant learning network theories and typologies that were applicable to the interviewees and, indeed, to digital content professionals.
### Table 37: Summary of learning network typologies

<table>
<thead>
<tr>
<th>Network type</th>
<th>Description</th>
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</table>
| Professional            | • This network is characterised by increased professional knowledge and skill, better practice, and is aimed at sharing and developing knowledge (Bessant & Tsekouras, 2001)  
                           • Connections with other professionals which have a direct impact and relevance to the person’s work (Rajagopal, Brinke, Van Bruggen & Sloep, 2012) |
| Sector-based            | This network type is highlighted by improved competence in some aspect of person’s work or job such as technical knowledge (Bessant & Tsekouras, 2001) |
| Topic-related           | This network is characterised by improved awareness and knowledge of a particular field (Bessant & Tsekouras, 2001)                             |
| Regional                | In this network type activity, knowledge, and information is shared based on a region or area (Bessant & Tsekouras, 2001)                           |
| Online personal networks| • Describes how a person maintains and manages social relationships through the use of online technologies (Haythornthwaite, 2000)  
                           • A personal learning network is a network which is specifically set up by an individual for their professional development through online platforms (Rajagopal et al, 2012) |
| Community of practice   | These are characterised by face-to-face conversations and discussions, involve active relationship building and maintenance between individuals within and outside the business with similar interests (Wenger, 1999) |
| Loosely-coupled         | This network is highlighted by employees who create their own sets of learning activities, and the learning is program is self-directed (Poell et al, 2000) |
| Horizontal              | This type of network is described as being open and thematic, characterised by learning through experience, problem-solving, and integrates into group work (Poell et al, 2000) |
| External                | This learning network has an external focus. It is highlighted by learning which is aimed at improving the employees’ professional capabilities, and an open learning environment (Poell et al, 2000) |
Interviewee informal learning networks

In documenting the informal learning network of the interviewees, the analysis, comparisons, and contrasts of the individual’s networks will be provided based on the two network mapping templates: the information-based and relationship-based network types.

*Information-based networks*

To provide a better understanding and to address the two research questions related to the function and role of informal learning network for industry professionals, each of the interviewee’s information-based network diagrams are shown below in Figure 7 and an analysis and comparison then follows.
Figure 7: Interviewees information-based network

Director – Digital and interactive marketing

Business management
- Nestle
- AIMIA
- Claire

Networking with others
- AIMIA
- Claire

Programming and software
- Online games and production

Industry and future trends
- Designs

Marketing
- Nestle Australia
- Graham

Technology
- VIP Pet Foods
- John
- Michael
- James

Designs

Interviewee 1

Chief Technology Officer – Applications and digital publishing

Business management
- Ruby Rails online group
- Ben
- Runar
- Jason
- Paul
- Oliver

Networking with others
- Ruby Rails online group
- Ben
- Runar
- Jason
- Paul

Programming and software
- Online games and production

Industry and future trends
- Designs

Marketing
- Ruby Rails online group
- Mark
- Tony

Technology
- JVM
- Mark

Online games and production

Interviewee 2

Development Lead – Applications and digital publishing

Business management
- AIMIA
- Claire

Networking with others
- AIMIA
- Claire

Programming and software
- Online games and production

Industry and future trends
- Designs

Marketing
- AIMIA
- Claire

Technology
- AIMIA
- Claire

Designs

Interviewee 3

Owner, sole trader, graphic design business

Business management
- Design College of Australia
- Graham

Networking with others
- Design College of Australia
- Graham

Programming and software
- Online games and production

Industry and future trends
- Designs

Marketing
- Design College of Australia
- Graham

Technology
- CS6 Adobe

Online games and production

Interviewee 4

Legend

<table>
<thead>
<tr>
<th>Relationship intensity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low:</td>
</tr>
<tr>
<td>Medium:</td>
</tr>
<tr>
<td>High:</td>
</tr>
</tbody>
</table>

Legend:
- Work colleague
- Industry peers
- Seminars & conferences
- Educational institution
- Professional association
- Friends
- Phone
- Email
- Face-to-face
- Online networking site
- Online forums
- Blog
- Wiki
Network typologies

The information presented in this section provides a comparison and a contrast of the interviewee’s network typologies that were identified in the course of analysing the interview transcripts and a diagrammatical representation of their respective networks.

Five different network types were identified in the course of documenting and analysing the respective network diagrams: professionally-based, online personal networks, communities of practice, region-based, and horizontal workplace networks. An analysis and description of the interviewee’s networks were identified by using a combination of the network typologies and informal learning networks that were identified in the course of the review of literature (see Bessant & Tsekouras, 2001; Haythornthwaite 2000; Lave & Wenger, 1999; Rajagopal et al, 2012), which were discussed earlier in Chapter 2.

Professionally-based

In looking at the network diagrams, it would appear that all the interviewees, in differing levels of frequency and intensity, engaged and interacted within their professionally-based learning networks. The network diagrams and the interview transcript analysis for three interviewees in particular illustrated the importance of interacting with other industry professionals as part of their ongoing skill and professional development.

The development lead (Interviewee 3) at the applications and digital publishing business noted that he interacted within his professional network of contacts for guest speakers at communities and practice sessions:

*When we want to bring in a particular person about a particular technology that’s where we look for sponsorship from someone from locally or from out of town so we can bring someone in to teach, or to give a guest a night ... but for us, we get to see these speakers come in and they do them round all cities so everyone is seeing the same stuff.* (I03)
For the director of the online marketing and communication business (Interviewee 5) accessing his professional network was particularly important for him to access key industry professionals: “there’s probably a dozen people that I will immediately go to every morning and see what they’re saying by paying attention to the influencers on all of those platforms” (I05).

In a different way, the lead games developer (Interviewee 6) pointed to the value of online technologies, such as forums and new aggregators, as a method for interacting with other games professionals:

*Gamasutra is primarily a news aggregator but it also has forums so people are typically commenting on news, they also have articles ... gamedev.net is more of a learning kind of forum where you have a mix of professionals ... I actually got involved in that forum in 2000 when I first tried to get into games.* (I06)

All the interviewees identified strongly with accessing their industry contacts for different professional development requirements, and, as such, the network diagrams show this was the dominant contact type employed by these professionals. It is also clear that industry professionals placed great importance and relevance on interacting and engaging with other industry professionals as part of their ongoing development. The most commonly discussed reasons for professionally-based interactions centred on factors such as the primacy of relationships and networking, and the ability to learn and gather and/or share information and knowledge from industry leaders and other industry professionals. The network diagrams and, indeed, the comments offered by these interviewees would seem to support the contention of Rajagopal et al (2012) that learners must maintain connections related to their professional interests and their immediate professional needs. These findings are also supported by Bessant & Tsekouras (2001), who claim that professionally-based networks are
practitioner-oriented where individuals are able to pool and share their knowledge and can be activated by engaging with various forms of online technologies.

**Online personal networks**

This form of network was found to be the one of the most common network types identified in the course of documenting the network diagrams. The use and application of online personal networks were varied, and was highlighted by the use of online networking sites.

In discussing the approaches he took in his ongoing skill and professional development, the director of the digital and interactive marketing agency (Interviewee 1) noted that a lot of what he did, and how he interacted with other industry professionals, was conducted mainly through online social networking sites:

*In terms of socially it happens digitally ... it’s through Twitter, it’s through Facebook, it’s through email and even it’s through phone conversation, it’s whenever I read something interesting I tweet it or post on online ... so the interaction just happens digitally.* (I01)

He also added that the use and access to some form of online technology was very important: “online technologies, like twitter, blogs, are indispensable for you ... I’ve only got a couple of hundred followers and they’re people that I know in the industry” (I01).

When talking about the approaches he has used, the chief technological officer (Interviewee 2) from the application and digital publishing business identified the use of online personal networks as being quite typical for professionals in the applications and digital publishing sector, as it afforded currency of information outside of a formal education and training course:

*This is quite typical of the industry ... it’s appealing as it’s not a course, it’s current and new, it’s related to the nature of our work, training or a course may not always*
be the answer; currency of information in some courses may be dated due to the rapid pace of change. (I02)

He also suggested that various online technologies were excellent methods for engaging and accessing his online personal networks:

One is reading technical information and that’s usually the blogs or following people on Twitter or whatever, Google plus or whatever ... so it’s really about peer learning or educating each other ... but really now it’s about going ‘oh I know this guy he’s in this community I’ll follow him’ and he might post interesting links from his friends, so it kind of, it all kind of disseminates. (I02)

On the other hand, the development lead (Interviewee 3) from the same business identified that he interacted with his friends on development code issues by using what he called “chat channels” (I03). He described chat channels as “an internet-based message service that’s used for group and/or one-on-one communication” (I03). He also alluded to the value and role that his personal relationships played in his ongoing skill and professional development and suggested that they allowed him to stay in touch with the industry as well as share common interests with his friends, who were also professionals in the industry:

I think that these connections are key, we share common interests and enjoyment so your social relationships really add to your and meet your, they assist in your ongoing development and learning in just keeping up with industry. (I03)

For the director of the online marketing and communication business (Interviewee 5) his need to access his online personal networks was driven by the fact a lot of his industry peers and personal friends were overseas (predominantly in the US) and he was able to interact with them by utilising various online technologies:

Well a lot of it is that I'm not in LA anymore, and I don't see these guys all the time and it’s a way for me to stay current or stay ahead... so my sharing and posting and
conversations about them gets me ahead ... my friends and I and my social network and I share a lot. (I05)

Accessing online news sites and forums played a large role for the lead games developer (Interviewee 6) in maintaining his professional currency and his access to other industry professionals. In discussing how he connected with his various relationships, he pointed to the use of online news aggregation and forum sites that are specifically aimed at the games sector, where he was able to interact with other industry professionals:

Like you’ll often see on gamedev.net and on gamasutra people will start asking questions about you know how to build or how to create a certain type of game which will typically be the flavour of the month and I’ll jump on and just help people out ... I don’t actually contribute a lot but I do read and comment. (I06)

Finally, it became very clear during the course of the interview with the general manager of the games studio (Interviewee 8) that he also utilised his online personal network as part of his professional currency, in particular with other industry professionals:

I’m a member of a variety of groups on LinkedIn for our industry ... I’m also a member of a number of groups on Facebook, games industry groups and regularly attend online hook ups. (I08)

In looking at the set of network diagrams at Figure 7, of particular note is the network diagram for the graphic designer (Interviewee 4), which shows that she did not access or interact with many people within her network of contacts. Her main interactions were highlighted by accessing online forums. In discussing her views on the relevance and role that social networks played in her ongoing professional currency she suggested that she did not see how they could assist in a person’s skill and professional development:

I think the avenue of using social relationships and networks is one that people don’t need to go down because you're not there as a person to stand up for yourself ... and
see and that might be because I have my own business ... when you’re a sole trader unfortunately you have to try and do everything from go and get the job, answering phones, invoices, pay bills. (I04)

Her network diagram was highlighted by accessing online resources on a needs basis, and she discussed how accessing various web resources was relevant to her as a sole trader: “I’ve got no one to ask, so when I go ‘how do I do this?’ I jump onto Google and I can get an immediate answer” (I04). These comments would seem to sum up her approach to accessing her network of contacts as being essentially ad hoc, on a needs basis, and is characterised by sourcing information through some form of online resource. It could be suggested that this anomaly, where the graphic designer does not interact greatly with her network of contacts, could be a product of her working as a sole trader. She has to do everything in the business, and noted that “working for yourself you don't see what everyone else is producing all the time” (I04) and added that she did not see the value and relevance of tapping into her social network and relationships through online networking. The argument could also be made that as a sole trader she should be more reliant on social and online networks and relationships for her professional development, however her focus seems to be more on accessing relevant design related information through some form of online resource “because there will be so many different answers you might find online” (I04). Given her role as owner and sole trader, it would seem that she does not place enough emphasis on interacting within her network of contacts to aid in her ongoing skill and professional development, but rather seems more focused on “being able to sell and win the job ... and that's because I have my own business” (I04).

The network diagrams and the comments clearly highlight the role that online personal networks play for these interviewees. The emphasis placed on engaging with their online personal networks was evident, not only from the comments but also from the
respective network diagrams shown above in Figure 7. The comments offered could be grouped into two broad categories: professional requirements and ease of access to informal online learning. The professional requirements comments centred on being able to connect with various relationships, having access to personal friends and personal relationships, while the ease of access comments focused on the currency of information, just-in-time information and knowledge through sources such as twitter, LinkedIn, Facebook and news sites.

These findings are strongly supported by the contentions of some writers (such as Dabbagh & Reo, 2011b; Dabbagh & Kitsantas, 2012; Rajagopal et al, 2012) who point to the value and role of online personal networks. Dabbagh & Kitsantas, (2012) and Rajagopal et al (2012) argue that the different online technologies provide a common platform where people can connect, are essential to maintaining personal and social relationships when separated by distance, and are able to facilitate learning. This was particularly evident in the network diagram of the director of the online marketing and communication business (Interviewee 5), who heavily relied on online networking sites to connect with his overseas contacts.

It would appear that online personal networks offer professionals the ability to maintain and manage their personal networks through the use of different online technologies. The network diagrams also show that the professionals used their online personal networks to source and/or share programming and software knowledge, and technology related topics. These online technologies offered the learner access to just-in-time expertise and knowledge, and access to content beyond the traditional organisational boundaries by removing geographical constraints. The use of, and access to, online personal networks would seem to provide learners with a new context for professional development, one that removes the physical limitations and offers a new approach to informal learning and which aids a person’s ongoing skill and professional development.
Communities of practice

The idea of engaging with face-to-face conversations and discussions to aid in a person’s skill and professional development through communities of practice featured quite prominently in the network diagrams for the interviewees from the technology and games sectors (Interviewees 2, 3, 6, and 8).

The chief technological officer (Interviewee 2) from the applications and digital publishing business discussed his involvement in communities of practice and noted there were several groups he attended that were particularly focused on specific technologies and which aided in his development in an informal way:

*There’s Brisbane web design there’s the ruby group, there’s a ton of them in Brisbane*... you know by going to the Ruby group and going ‘I'm having this problem with some rails code that I’m working on’ and someone might say ‘oh yeah I know how to solve that’ and go for a beer or whatever ... there’s no direct benefit to the company but there’s a benefit personally by going.* (I02)

He also discussed how he attended face-to-face sessions called Mobile Monday, which assisted his professional development in broader business areas:

*Mobile Monday was on, that was fairly applicable to me in that it was called start up night and I was a panellist ... it was mainly a panel session around how to start a business and problems in small businesses in technology and what legal advice and accounting advice you need and stuff like that.* (I02)

The development lead (Interviewee 3) from the same business also discussed the value of face-to-face meetings in terms of the informal approach to communities of practice related to particular technologies:
I think we’re doing a good job with self-organising a lot of that. It just kind of happens. As you get enough people who are interested in, there are some technologies that let us just start the group and then get people together. (I03)

The network diagrams also show that communities and practice are quite active in the games sector. The general manager from the games studio (Interviewee 8) reflected on how games related face-to-face sessions (communities of practice) were organised in Brisbane:

The games industry is very active, especially in Brisbane and they organise monthly meetings where a lot of the industry get together and just talk about current trends in the industry. (I08)

It would appear that communities of practice not only play a role in certain sectors of the industry but are also very relevant to meeting the learning needs of industry professionals. Several interviewees discussed how they were active members of communities of practice that were relevant in their respective sector of the industry. These communities of practice took the form of formally organised or convened face-to-face sessions, and informal meetings and group sessions. The interviewees noted that in some cases the community of practice afforded them an informal way to address their learning; while others noted that communities of practice aided their professional development in targeted areas. They all agreed that within their sector communities of practice were well organised and active and offered an excellent personal learning benefit. The value and significance to learning of communities of practice is highlighted by Lave & Wenger (1991) and Wenger (2010). The other feature of these communities of practice that was discussed by the interviewees was the ability to meet face-to-face with other industry professionals. This is highlighted by the comment offered by the chief technological officer on his views of communities of practice: “they have enabled extreme levels of sharing ... it’s also about being surrounded by other people that are just as passionate about learning” (I02). This is a key feature noted by Wenger (1999); he suggests
that face-to-face interaction greatly assists interaction and the exchange of information. In essence, these interviewees clearly support what Lave & Wenger (1991) identify as an important informal learning approach and the contribution that external resources and relationships can make to supporting and facilitating the learning process.

Region-based

The idea of region-based learning networks has been adapted in this case to encompass the interviewees who discussed meeting with Brisbane based learning groups. The interview transcript analysis shows that three interviewees (Interviewees 2, 3, and 8) were particularly active in Brisbane-based learning networks.

The chief technological officer (Interviewee 2) highlighted how he participated in a Brisbane-based technical group that met on a regular basis. In his interview he noted that there were many different groups, meeting regularly, that focused on particular programming and technologies:

There’s many, many user groups in Brisbane and a lot of our guys go to a lot of them. And you’re there at something about meeting face-to-face. There’s Cocoa Heads, which is one for IOS stuff, there’s Mac programming as well, Java script user group that’s run by a friend of mine … there’s the Queensland JVM group that met last night. (I02)

The network diagram for the general manager of the games studio (Interviewee 8) showed he has attended Brisbane-based games related functions and he noted that social relationships and networks were very important: “social relationships and networks are extremely important … I go to networking events and functions, drinks and stuff … it’s about keeping in contact with what’s happening in the industry” (I08).

In a similar way to communities of practice, these interviewees clearly found that meeting with a locally-based group aided and promoted their professional currency. In the
course of their interviews, the interviewees noted that they saw value in meeting with like-minded professionals as an approach to building and increasing their capabilities. The relevance of interacting with locally-based groups, and being involved with them, was emphasised by one interviewee who suggested: “I’ve got a bunch of people who I can turn to talk to and get help” (I03) and added that by having access to local groups was an informal approach to staying current. These findings are supported by the claims of Bessant & Tsekouras (2001), who contend that region-based or, in this case, a city-based learning network specifically targets learning areas. They add that region-based learning networks can be trade or sector based, that they can form into clusters of localised learning, and that they are a great source in knowledge development among professionals in a region.

**Horizontal**

In reviewing the network diagrams, two interviewees engaged quite heavily with their work colleagues in a horizontal learning network as part of their work function, and this supported their ongoing development. This was evident, through the interview transcript analysis, where some interviewees discussed how interacting with their work colleagues assisted and progressed their own development.

The lead games developer (Interviewee 6) highlighted how the interactions with his work colleagues assisted in his overall management, communication and problem-solving skills, and his job function:

*There’s definitely elements of management you need to be able to communicate and work with other team members ... problem-solving within the team, I’m usually able to get the answer from our own sphere so it will be from the guys like in the design team ... we’ll usually nut out a problem like that.* (I06)

However, for the game play programmer (Interviewee 7) interactions with his work colleagues were focused more on his role as part of the current project:
Everything with [name deleted] our technical director would be face to face ... [name deleted] is our he’s lead programmer and it’s all pretty much face to face with him as well ... I’ve worked alongside him you know pair programming at the start and then he gives me tasks to branch off to ... [name deleted] he’s very well versed in Action scripts and Flash already so if I have small technical questions he’s certainly there to go to. (I07)

It could be concluded, given the project-based nature of work in the games sector, that the reliance and utilisation of these interviewees’ horizontal networks would seem to be applicable and relevant as it suited their particular work environment. The two interviewees from the games studio reported that the main reasons they needed to engage with their work colleagues was because of problem-solving, project-related work and games specific issues. These comments and findings would seem to support the contention of Poell et al (2000) that horizontal learning networks are highlighted by problem-solving and integrate learning with the work function. These findings are also supported by other parts of the literature, which contends that informal learning is a work-based function that can be enacted through work colleagues. In his study, Tak (2008) found that by having access to work colleagues, IT professionals gained valuable insights and knowledge, and relevance to their work practices, while Brown & Duguid (1991) suggest interacting with work colleagues places knowledge in a work context. These writers all agree that collaboration and interaction with work colleagues in the workplace setting develops and promotes an individual’s development, and this is borne out by the network diagrams depicted for some of the interviewees.

In summary, it was found that five different network types described the function of learning networks and how those learning networks operated for industry professionals. It was reported that the majority of the interviewees accessed and engaged with predominantly two types of networks: professionally-based and online personal networks. In the course of
documenting and analysing the network diagrams, it was found that the interviewees felt that it was important to interact with other industry professionals as part their ongoing professional currency as it afforded them the ability to interact with other practitioners, they were able to share their experiences and knowledge. Coupled with their professionally-based networks, the interviewees also reflected on the role their personal online networks played in maintaining their ongoing professional currency. It was reported that access to different online technologies promoted peer learning and gave them access to wider, geographically-distanced, social networks. It was also reported that communities of practice were particularly active in the technology and games sectors in Brisbane. It was found that they were well organised and met the requirements, particularly for technology and games sector professionals, in terms of professional currency and relevance to their job and their sector.

Finally, it was found the games sector interviewees relied heavily on interacting with their work colleagues as part of their skill and professional development. It was suggested that this was a valid approach for games sector professionals as they operated in a project-based mode where interaction with work colleagues was directly related to games development.

The next section focuses on the most significant information and knowledge that was shared and gathered by the interviewees when analysing the topic-related network diagrams.

*Topic-related networks*

The data presented in this section provides a comparison and contrast of the information and/or topics shared by the interviewees within their respective networks based on their roles within the industry. In gaining a better understanding of the role that informal learning networks play for the interviewees, specific network mapping questions were asked in relation to the topics, information and/or knowledge that was shared or gathered within their respective networks. Eight topics were identified by the interviewees: programming and
software capabilities, industry and future trends, business management, networking with others, technology, online games, designs, and marketing. Each of these topics was coded by using a combination of the skill frameworks, and skill and competency lists, that were identified in the course of the review of literature (for example Binkley et al, 2010; EnGauge, 2003; Eraut, 2004; ITSE, 2007; P21, 2006; Mumford et al, 1999) discussed in chapters two and five.

Four topics provided the most significant comments in terms of information sourced and/or shared within their respective networks: programming and software capabilities, industry and future trends, technology, and online games. These will now be discussed in terms of their relevance to topic-related, or information-based, networks.

**Programming and software capabilities**

A key theme that emerged in documenting the respective networks was in programming and software skills. A majority of the interviewees identified programming and software to be a topic or a knowledge requirement that was particularly relevant to their professional currency. For instance, the chief technological officer from the applications and digital publishing business (Interviewee 2) noted that when looking for advice and assistance related to programming and software issues he accessed his network to source the information:

*Look at ruby rails ... I follow people that do that and mainly they’d be people that I know personally. Like there’s a guy in Melbourne Ben who moved to Melbourne who used to work with me and I know he’s really good at what he does. So you know if he’s got something interesting to say I’ll usually follow it or I’ll actively seek out his advice.* (I02)

The network diagram for the development lead from the applications and digital publishing business (Interviewee 3) showed him to be heavily focused on programming and
software capabilities and technology. In describing his role, and the topics and information that he accessed within his network of contacts, he noted that the information and knowledge he sought or shared was directly related to his role:

\[ I’m \text{ creating software, but also playing a lead role in the team and providing some technical direction to the other guys and coming up with the bigger picture sort of architecture of systems ... so that’s where I might learn that a bit of software has been released through reviews and online ... then I’d go a little bit further and I might say oh yeah that did come out, that group did release that thing. } \] (I03)

For the sole trader/owner graphic designer (Interviewee 4), her requirement for software knowledge stemmed from a requirement to use computer-based software for the look and feel of designs and to meet her clients’ needs:

\[ \text{Oh software that’s the thing ... well most graphic designers you’ll find will use Apple Macs because for the postscript language ... and you just learn the Adobe suite such as Photoshop and Illustrator ... you’ll obviously use like software PowerPoint and stuff because you’ll have to produce PowerPoint presentations for companies.} \] (I04)

Another interviewee (Interviewee 7), in his role as a game play programmer pointed to a requirement to access his network of contacts in terms of his programming and software currency. He suggested that programming, game development and game operation was the main reasons he accessed his network to develop his knowledge:

\[ \text{Yeah well like with game playing, game play there’s quite a lot of you know things like AI (artificial intelligence) control you know how the actors in a game to operate ... also I’ll look for tutorials specific to learning a language like Scala ... so I’ll look online and see how that works as well as talking to other programmers I work with and you know lead programmers to try to fill in those gaps.} \] (I07)
Quite clearly, the interviewees that identified programming and software related topics within their networks did so as it was directly related to their jobs. The requirement to share and source programming and software related topics does not seem to be sector specific, but, rather, programming and software skills would seem to be more relevant for those in the application and digital publishing, graphic design, online marketing, and games development sectors of the industry. This is a view supported by Bessant & Tsekouras (2001), who suggest that these types of topic-based networks not only improve awareness, knowledge and techniques but are also specifically focus on learning and knowledge in a particular area.

The role of the respective networks for a number of the interviewees (2, 3, 4, 5, and 7) clearly show a link between their role, their sector of industry, and, particularly, how programming and software related topics have differing applications and relevance to their professional currency. When looking at the roles of those interviewees who identified programming and software capabilities as a development requirement, it is noticeable that they were from both management and technical type roles. However, what is also apparent when looking at the network diagrams is that not all the interviewees (1, 6, and 8) had a need to progress their programming and/or software skills. Based on these findings, the findings of the online survey and the claims made by some writers in the literature it could be argued that regardless of their role within the industry, current and updated programming and software knowledge is particularly relevant for all industry professionals. This is in line with what is argued in parts of the literature, where it is suggested that skills such as digital literacy and technology operations and concepts, and the fact that ICTs and software is richly interwoven in 21st century work, are skills that must be considered key competencies for all workers and learners alike (see Binkley et al, 2010; Dede, 2009; EnGauge, 2003).
Industry and future trends

Keeping up-to-date and abreast of industry and future trends featured prominently in the course of documenting the topic-related networks shown above in Figure 7.

The director of the digital and marketing business (Interviewee 1) discussed the relevance of interacting with an industry association. He discussed how it was an excellent source of industry and future trends, and suggested attending association functions was an excellent approach to staying in touch with the industry:

*The industry is really, really good because people share stuff ... you can have a conversation with someone and find out where you’re pitching against each other, or you find out someone else has got some information and this is what’s going on in the industry, or this has changed or this is something new you need to watch out for, whatever ... so it’s an inclusive industry which is lovely.* (I01)

He (Interviewee 1) also added that his clients were also a source of industry and future trends:

*This is going to sound weird ... our clients help us. And they help us by being conducive to the things that we put in front of them. They help us by giving us challenges that we need to solve which contribute to professional development and all the rest.* (I01)

For the director of the online marketing and communication business (Interviewee 5) his need to stay abreast and up-to-date with industry and future trends was sourced from trusted industry peers via online networking sites:

*Generally the online networking sites help me stay current, my sharing and posting and conversations about them get me ahead ... because I can read a story in Mashable say, but then I can hear what [name deleted] says about it or what Jason*
says about it or what [name deleted] says about it and because they’ve been involved in the industry and then I get ahead. (I05)

In a similar way, the general manager of the games studio (Interviewee 8) also accessed his network of industry peers in terms of industry and future trends, and supplemented his face-to-face discussions by using online networking sites:

They’re people that work in different parts of the industry and so usually on a monthly basis I would meet with all three of them and just touch base and see what’s going on where you know because a month is a long time in our industry ... these guys are avid users of Twitter and their Twitter feeds get posted on facebook ... so wherever they are and whatever they’re doing, if they’re at a conference or promoting something they’re always talking about interesting things they’ve seen or done ... they certainly post on my facebook page and I’ll post on theirs. (I08)

The other two interviewees from the games studio (Interviewees 6 and 7) identified two games specific websites (gamasutra.com and gamedev.net) as sources for currency of news and information within the games sector. The comment offered by the lead games developer (Interviewee 6) summed up the role these sites play as being a key source for industry news and trends for people in the games sector:

Forums like gamasutra.com and gamedev.net are interesting because they’re a way of capturing information like news that’s coming up or things, trends that are starting to happen ... so you start seeing trends there that’s pretty much what I use those for is keeping up with news, sharing ideas and seeing what the trends are. (I06)

The network diagrams and the remarks provided by these interviewees would seem to suggest that staying abreast of, and up-to-date with, emerging and current industry trends is primarily sourced through trusted industry peers, either through industry associations, face-to-face discussions or via some form of online resource. This was particularly evident in the
network diagrams for Interviewees 1, 5, 6, 7, and 8. In their comments, they discussed the relevance of engaging and interacting with professional associations and industry peers as an approach to upgrading and updating knowledge. This finding would seem to add weight to the claims made by Bessant & Tsekouras (2001) that professional associations and industry contacts represent a form of a learning network, which can be more active facilitators of learning than other types of learning networks.

However, the network diagrams show that not all interviewees accessed their networks to stay up-to-date and current with industry and future trends (see Interviewees 2, 3, and 4). This raises two questions for those interviewees who did not utilise their social networks for industry and future trends: (1) how do they stay in touch with developments and trends in the industry; (2) how does it affect their professional currency in terms of their job function. This could be the subject of further study.

Technology

The interviewees who shared and/or sourced information and knowledge on technology related topics were all from technology related businesses: digital and interactive marketing, applications and digital publishing, and online marketing and communications.

For the director of the digital and interactive marketing agency (Interviewee 1) his need to engage with his network of contacts stemmed from ensuring that he maintained his technology currency in terms of the most up-to-date hardware and platforms to demonstrate to clients:

*I’ll give you an example of that and how we would use those types of things ... if I’ve got it I can show the client, then the things that I’m using at the moment should be the tools that my clients are using to sell their stuff ... I’m always looking for the next thing.* (I01)
The chief technological officer (Interviewee 2) from the application and digital publishing business pointed to an inter-connected network of industry people, both here in Australia and overseas, who shared ideas and assisted each other with technological issues:

These guys, they’ve actually got the expertise, that’s just what I was after, and all via twitter ... but that’s pretty typical of the way that I certainly would find stuff ... there’s another guy that I used to work with called [names deleted] and [name deleted] now knows [name deleted] and [name deleted] , well [name deleted] is from Brisbane so he knows [name deleted] but he now knows [name deleted] and he works in Switzerland and he knows this guy now too. I can follow him because I know he does phenomenal stuff ... it’s all like that typically it’s either so new that nobody knows it or there will be some stuff posted about it like a news article, or maybe some code somewhere that you might be able to get out and find some code. (I02)

For the development lead (Interviewee 3) from the applications and digital publishing business interacted with industry peers and friends in terms of sourcing useful information on different types of technologies:

A friend of mine from Brisbane [name deleted], so he’s been useful ... I guess there are people in the different communities for particular technologies, say Haskell, there would be [name deleted] ... I chat to him probably every day through chat channels ... we keep in pretty regular contact. (I03)

The director of the online marketing and communication (Interviewee 5) also mainly accessed his network of industry peers for technology currency, to keep up with trends in mobiles, the internet and other forms of media:

[Names deleted] are basically technology ... you know internet trends, mobile trends and all other types of media. [Name deleted] is the same thing, [name deleted] and I talk a lot about that as well. (I05)
It can be seen from the comments offered, and in the network diagrams, that a number of interviewees (1, 2, 3, and 5) and their respective businesses were heavily based in the technology side of the industry, in the applications development, digital publishing, and online marketing and communications sectors of the business. The role of their respective networks, as was highlighted by the respective network diagrams, shows a clear delineation within the entire group of interviewees. The network diagrams also show a clear link between the interviewee’s role, their business function, the importance of progressing their technological knowledge, and how they utilised their network to source and share this knowledge.

However, for the other interviewees (4, 6, 7, and 8), currency of technology related topics was not considered a priority in their development requirements. It could be inferred that this is directly related not only to their sector of the industry, namely graphic design and games, but to their job function and business functions. From these findings, it is argued that the need for professionals to maintain their technological currency is directly tied to their specific occupation, the sector and their business function, or what Mumford, Peterson & Childs (1999) call occupationally-specific technical skills.

**Online games**

The three interviewees from the games studio all discussed how they accessed their respective networks to ensure their currency within the ever-changing world of games.

The lead games developer (Interviewee 6) mentioned meeting and discussing their current project and developing a network of contacts within both the games and the wider entertainment field:

*We went to San Francisco two or three weeks ago for work so that’s somewhere else*

*I’ve done interaction ... we went to the Pixar head office so we interacted with quite a few people there so there was [name deleted] and a few other guys there like [names*
deleted] ... primarily about what we’re actually doing on this project coming up as well as getting to know people. (I06)

The games play programmer (Interviewee 7) noted that his face-to-face discussions with the games studio’s technical director centred mainly on the current project’s technical design and changes:

*In the lead up to this project I discussed quite a bit back and forth with [name deleted] about what my role would be ... there was a few changes here and there, but he directed me as to what sort of things I might have to learn to a degree in terms of game development ... he also gave me flexibility to do my own research on games in general.* (I07)

A common theme throughout the interview with the general manager of the games studio (Interviewee 8) was him staying abreast of changes and trends not only in the games industry but also the broader entertainment industry: “technology and entertainment trends I definitely want to keep current” (I08). In discussing the value of completing the course at Victoria University, he reflected on the similarities between the games and entertainment industries and how in his role as general manager affected his studio in terms of contracting resources:

*The film and television course was really for me to understand what the key differences were between the sorts of contracts that we put in place for both our talent and around production ... if you’re doing an animated feature film, how do they approach contracting art resources versus how do we approach contracting art resources ... it allowed me to look at that industry because it’s very closely associated industry to us, we use voice actors, we use artists, we use composers, all the same sort of talent.* (I08)
It should be noted that this interviewee reflected heavily on his interactions with his industry peers, and these were documented earlier in this section in terms of industry and future trends and networking opportunities, where he noted they worked in other parts of the industry and on other types of products.

The director of online marketing and communication (Interviewee 5) also interacted with his network of contacts for information on the games sector because he was interested in a variety of entertainment and media businesses, in which he had also worked:

*I’m interested in other stuff too ... [names deleted] are games ... [name deleted] ran Yahoo games and was on the engineering team that built the Windows Media Player... I’ve known these guys a long time ... I’m always learning different stuff.* (I05)

The online games sector is a specialised sector within the digital content industry. To that end, the network diagrams and, indeed, the interview transcripts for the interviewees from the games studio clearly show the need to interact within their respective games-specific networks in terms of information, knowledge and topics specifically related to the games sector. However, the general manager, in his role as executive producer and studio manager, was focused on the broader issues of contractual arrangements and linkages with the entertainment industry in managing the ongoing day-to-day business operations. The need to stay current and up-to-date with changes and development of the games sector, as discussed by these interviewees, is also highlighted by the Game Developers Association of Australia (GDAA, 2010) and Haukka (2011). They argue that, given the rapid change and use of technology and changes within the games sector, professionals in this sector need to consistently be able to maintain and progress their skills, and be able to work in project-teams and project-driven businesses.

In summary, it was found that five different network types described the function of learning networks and how they operate for these industry professionals. It was reported that
all of the interviewees accessed and engaged with predominantly two types of networks: professionally-based and online personal networks. In the course of documenting the network diagrams it was identified that the interviewees engaged and interacted with other industry professionals as part their ongoing professional currency. Coupled with their professionally-based networks, the interviewees also reflected on the role their personal online networks play in maintaining their ongoing professional currency. It was reported that access to different online technologies promoted peer learning and access their wider geographically-distanced social networks. It was also reported that communities of practice were particularly active in the technology and games sectors in Brisbane. It was found that these communities of practice were well organised and seemed to meet the skill and professional development requirements, particularly for technology and games sector professionals. Finally, it was found that the games sector interviewees relied heavily on interacting with their work colleagues in project teams and games-specific contacts as part of their skill and professional development. It was suggested that this was a particularly valid approach for games sector professionals, as they operated in a project-based mode where interaction with work colleagues was directly related to games development.

The next section reports on and describes the relationship-based network diagrams for the interviewees.

**Relationship-based networks**

To further understanding and address the two research questions related to the function and role of informal learning network for industry professionals, the interviewee’s relationship-based networks were analysed in terms of the number of relationships, intensity of the relationship and the flow of information. Figure 8 below shows the relationship-based networks for the interviewees.
Figure 8: Interviewees relationship-based networks

Director – Digital and interactive marketing

Chief Technology Officer – Applications and digital publishing

Development Lead – Applications and digital publishing

Owner, sole trader and graphic designer

Legend

<table>
<thead>
<tr>
<th>Business management</th>
<th>Networking with others</th>
<th>Technology</th>
<th>Design</th>
<th>Qualification</th>
<th>Online games and production</th>
<th>Programming and software</th>
<th>Marketing</th>
</tr>
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<table>
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<tr>
<th>Relationship intensity:</th>
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<tbody>
<tr>
<td>Low</td>
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<tr>
<td>Medium</td>
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<td>High</td>
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Number of relationships

The size of the respective networks in terms of the number of relationships, or range (Garton, Haythornthwaite & Wellman, 1997) refers to the number of actually-occurring relationships either through sharing, reading and/or posting online information, and interacting with people and/or groups on a certain topic. Although eight interviews were conducted, the respective network diagrams showed a variation in the number of relationships across the group of interviewees. The number of relationships shown in the network diagrams (see Figure 8 above) ranged from six to 13, with an average of nine relationships.

The network diagrams showed the highest number of relationships were 13 and 12 respectively for two interviewees: the director of the digital and interactive marketing agency (Interviewee 1) and the director of the online marketing and communication business (Interviewee 5). The smallest number of actual-occurring relationships identified (the graphic designer, Interviewee 4) was six, the majority of which were online resources. However, one of her high intensity relationships was related to her undertaking a training course. It could be argued this was due to her working as a sole trader, and she noted in her interview that she did everything in terms of business operation. Of particular note, the general manager of the games studio (Interviewee 8) identified eight relationships within his network of contacts; however, it can be seen in his network diagram that the majority of his interactions were with three industry peers, with whom he interacted in face-to-face meetings and through online networking sites.

The number of relationships within each of the respective networks, and the average number of relationships for this group of interviewees, would seem to support the contentions of a number of writers that a person will need to typically maintain between seven and 12 relationships in order to effectively share and/or source information (see Garton et al, 1997;

In looking at the set of network diagrams in Figure 8, it is clear that social networks do in fact vary in their size and composition. Given the differences between the documented networks, it could be argued larger networks (particularly Interviewees 1 and 5) have an assorted range of characteristics, such as its members, the information shared and the mechanisms of interaction, while the smaller networks (Interviewees 2, 3, 4, 6 and 7) appear to have a narrower focus of topics and methods of interaction.

Intensity of relationship

The data presented in this section provides a comparison and analysis of the intensity of the relationships shown within the network diagrams. In the course of the literature review, it was identified that the intensity of relationships (Conway & Steward, 1998; Haythornthwaite, 2000) or strength of ties (Granovetter, 1973; Haythornthwaite, 1996; Petroczi, Nepusz & Bazso, 2007) play a significant role in describing the relationship between individuals in a network. To better understand the role that informal learning networks played for the interviewees, questions were asked in relation to the frequency of interaction for each connection within the interviewee’s network. Three types of relationship strength were identified in the course of documenting the network diagrams: high, medium and low intensity.

High intensity relationships

The network diagrams clearly show that all of the interviewees relied on high intensity relationships, or strong ties within their respective networks. These were particularly highlighted by interactions using face-to-face meetings, online networking sites, online forums, email, and, to lesser extent, phone conversations. The interviewees who identified they interacted at a high level with individuals or groups did so on a daily basis, in some
cases once every couple of days, while two interviewees (Interviewee 1 and 2) noted that they interacted on an hourly basis with some of their network connections.

The comments offered by the director of the digital and interactive marketing agency (Interviewee 1) would seem to typify the value of high intensity relationships that he accessed through different communications methods to acquire just-in-time knowledge: “the majority of social interaction in this industry occurs on an almost daily basis” (I01).

Another interviewee (Interviewee 2) suggested that, for him, and, indeed, in the technology sector, he accessed his various network connections to source news and information on technology on a daily basis:

*In general the other things I do on a daily basis is reading articles on the web, whether they’re blogs or articles on like news sites and things like that, or any articles shared internally ... but really now it’s about going ‘oh I know this guy’ he’s in this community I’ll follow him and he might post interesting links from his friends, so it all kind of disseminates.* (I02)

It can be noted that two interviewees (Interviewees 4 and 8) identified that they interacted within their network at a high level and did so in the course of completing and/or attending some form of formal education and training course or workshop.

By looking at the various network diagrams, it could be concluded that high intensity relationships or strong ties provide frequent and timely access to information that allowed for the exchange of information between the individuals. This finding supports the contention of Haythornthwaite (1996), who argues that tie strength or intensity shows the overall connectedness of individuals in a network, and that strong ties provide more information. The high intensity relationships represented in the network diagrams would also seem to confirm the contentions of other writers that high intensity relationships aid the receipt and sharing of useful knowledge, where information is freely shared between individuals, and are typically
used to exchange complex knowledge (such as Levin & Cross, 2004; Petroczi et al, 2007). The network diagrams also seem to confirm this point, in varying degrees, where they clearly show the interviewees interacted with their network of such contacts as industry peers, work colleagues and clients, and by accessing various online resources on a daily and at times hourly basis. Several interviewees (Interviewees 2, 3, and 5) also reported the relevance of their connections to personal relationships as a source of information and/or knowledge exchange. This finding appears to be in line with some of the literature reviewed in the course of this study. For instance, Haythornthwaite (2000) argues that personal networks are a source for ongoing learning, that personal relationships allow for intimacy and frequent interaction and that face-to-face contact offers positive learning outcomes for individuals and groups alike.

Another feature of the interviewee’s network diagrams was the heavy reliance and interaction with multiple network connections using different forms of online technologies to manage their high intensity relationships. The comments offered by the interviewees clearly establish the role that online and digital networks play in being able to share expertise and knowledge. The interviewees strongly identified with using online networking sites, online forums, news aggregation sites, blogs and, to a lesser extent, email as a means of interacting on a more frequent basis within their respective networks, and being able to access timely or just-in-time information. These findings strongly support the views of a number of writers that the use of, and access to, these various online resources enhances access to timely information and alleviates geographical boundaries and constraints (for example Dutton, 2008; Haythornthwaite, 2000; Petroczi et al, 2007). In fact, Haythornthwaite (2000) also suggests that frequent communicators make use of different forms of media and results in better access to information and knowledge, and, more importantly, allows access to more timely information.
The network diagrams clearly show that the high intensity relationships comprise not only of face-to-face contact but also geographically-distanced high intensity relationships, which were maintained by engaging in some form of virtual or digital relationship through some form of online technology/s. The network diagrams and the interview transcript analysis show that those with high intensity relationships also appear to communicate with, and interact within, their network using multiple media and were able to actively seek and share information and knowledge. These two points are particularly evident in the network diagram for Interviewee 5, who engaged with his industry peers and friends located overseas through online networking sites and email. From these findings it could be argued that the reliance on, and access to, high intensity relationships or strong ties is driven by two factors to aid ongoing skill and professional development of industry professionals: the ability to source and/or exchange just-in-time information, and by accessing some form of online technology.

*Medium intensity relationships*

In the course of documenting and analysing the network diagrams, it was found that only one interviewee (Interviewee 8) identified interacting within his network at a medium-level of intensity. It was shown in the network diagram for the general manager of the games studio that he interacted with other industry professionals in two primary modes: through online networking sites and through face-to-face contact. It was these face-to-face contacts where he noted he met monthly with other industry professionals from different parts of the games sector: “they’re all people that work in different parts of the industry and so I usually meet with them on a monthly basis” (I08).

The notion of medium intensity relationships is discussed by Haythornthwaite (2000) and Tichy, Tushman, & Fombrun (1979). They suggest that those with medium intensity relationships typically establish and use other media to maintain and further support their
network relationships. Haythornthwaite (2000) adds that medium intensity relationships play a unique role in supporting and enhancing high intensity relationships, are an indicator of socialising and can provide fun and friendship for the individuals. Based on this set of network diagrams, it would appear that medium intensity relationships are not widely used by industry professionals as they offer only intermediate interaction and access to information, but they are important for supporting and enhancing other relationships. This finding could also add weight to the suggestion made earlier that industry professionals rely on high intensity relationships that provide greater access to instant, just-in-time information and knowledge to support their ongoing skill and professional development.

Low intensity relationships

A number of interviewees reported that they interacted within their respective networks in an infrequent manner. These types of interactions were coded as low intensity relationships or weak ties. In the course of documenting the network diagrams, three interviewees reflected on the role and reasons for their low intensity relationships.

One interviewee (Interviewee 1) noted that he could no longer attend industry association meetings due to time pressures; however, he noted that when he could attend face-to-face meetings the interaction was more relevant than some online interactions:

But socially I still involved with AIMIA depending on when they have the social things and if I'm in the city ... so face to face for me has gone dramatically backwards, and that annoys me because I can get a lot more out of having a face to face discussion with someone for ten minutes than you do on Twitter or on the phone. (I01)

Both the lead games developer and the game play programmer (Interviewees 6 and 7 respectively) discussed how their low intensity interactions with their work colleagues was primarily focused on project start-up, and building relationships within the project team. The lead games developer noted: “we initially interacted with a few people like Will and Mark on
what we’re doing on this project” (I06) while the game play programmer added “we’re communicating and establishing a relationship” (I07).

While not many interviewees identified that they engaged in low intensity relationships within their respective networks, it would seem that those who interacted infrequently with contacts within their respective networks felt they were just as important as high intensity relationships. This was emphasised by the low intensity relationships or weak ties discussed by Interviewees 1, 6 and 7. Their network diagrams show that their low intensity relationship contacts and interactions within their respective networks were primarily with industry associations and work colleagues. In the case of these interviewees, the information and knowledge centred on new ideas, information, industry trends and work-related issues. The relevance and importance of low intensity relationships or weak ties is highlighted by Granovetter (1973), who suggests that weak ties are just as important as strong ties in terms of knowledge sharing. He adds that weak ties can provide access to new information because the contact gives them access to a different set of individuals and sources of information. Haythornthwaite (2000) agrees with this and suggests that low intensity relationships provide exposure to a wider range of different ideas and viewpoints. A number of writers point to the importance not only of high intensity relationships but also the need to be supported by weak ties to better serve information and knowledge exchange (such as Burt, 1992; Granovetter, 1973; Haythornthwaite, 1996, 2000). For those interviewees with low intensity relationships, particularly Interviewees 1, 6 and 7, the network diagrams show that they supplement their high intensity relationships with low intensity relationships by interacting within their respective networks on an infrequent basis to gain access to new information and knowledge related to their job and work functions.

In summing up this section, the network diagrams show that the average number of actually-occurring relationships for these interviewees was nine, and the size and composition
of the respective networks varied. Overwhelmingly, it was also found that the interviewees chose to interact within their respective networks using high intensity relationships or strong ties, and they interacted in different ways with their strong ties. In the course of documenting the network diagrams the interviewees who interacted in a high intensity relationship did so because they provided frequent and timely information and knowledge, while it was also found that access to their personal friendships and networks were also a source of learning and development. Some interviewees noted that they interacted with contacts within their networks on an infrequent or a low intensity basis. It was found that these types of interactions were just as important as high intensity relationships as they offered different sources of information and exposure to different perspectives. In documenting the low intensity relationships, it was shown that some interviewees who engaged with low intensity online relationships did so to support and enhance the information and knowledge sourced from their face-to-face contacts. Finally, it was reported that medium intensity relationships were the least used by this set of industry professionals.

The next section discusses the relevance of the flow of information within the various networks.

*Flow of information*

All the interviewees predominantly interacted within the respective networks using two-way communication. In looking at the different network diagrams the two-way flow of information was mostly through some form of online technology such as networking sites, forums and email. When looking at the individual network diagrams, all the interviewees reported the use and access to some form of online resource as their foremost approach to facilitate the flow of information within the respective networks.

For instance, the director of the digital and marketing business (Interviewee 1) in his interview suggested that his “daily routine” (I01) would be to download and share
information he has sourced from technology blogs and online networking sites with people in his network, as well as to communicate and interact with his clients. This interviewee suggested that this was possible due to having an iPad, and noted: “I couldn’t exist without it” (I01). To a lesser extent, he noted that he exchanged and shared information, particularly with his clients, using email and phone. So, it would seem for this interviewee that having a digital device like an iPad enabled him to freely exchange, gather and share information within his network of contacts using different forms of technology.

In a similar way, the chief technological officer (Interviewee 2) and the development lead (Interviewee 3) from the applications and digital publishing business also discussed how they relied on either online networking sites or online forums to facilitate and allow for communication with people in their respective networks, as was highlighted by this comment by the chief technological officer: “you can just watch it and comment, you can check it twice a day ... and it’s reciprocal” (I02). While they both relied on online networking sites and/or online forums to manage the flow of information within their respective networks, their two-way flow of information would seem to be facilitated by the fact that they knew the people they interacted with, and exchanged and sourced information with experts within their fields. This also seems to be the case for the director of the online marketing and communication business (Interviewee 5) and the general manager of games studio (Interviewee 8), who interacted with a wide range of contacts on a wide range of topics within their respective networks.

Generally speaking, the network diagrams showed that two-way face-to-face interaction was less utilised by the interviewees. However, the network diagrams show six interviewees (Interviewees 1, 2, 3, 6, 7 and 8) engaged quite frequently in two-way face-to-face communication. These were highlighted by discussions and conversations with clients (Interviewee 1), other industry professionals in communities of practice (Interviewee 3 and
A comment offered by the director of the online marketing and communication business (Interviewee 5) sums up the value of two-way face-to-face communication: “what works for me is face-to-face and being with them” (I05).

The network diagram for the game play programmer (Interviewee 7) stands out, as most of his two-way communication was with his work colleagues. In his interview, he stated that most of the information and knowledge he needed for his job was sourced at the studio, as his role was mainly technical in nature, in terms of programming, software management and game design. It could be concluded that two-way face-to-face communication is mainly facilitated through some form of reciprocal exchange of information, and knowledge in a face-to-face mode and is highly effective, as it is personable and interactive in nature.

The network diagrams are also highlighted by elements of one-way flow of information toward the interviewee (see Interviewees 2, 3, 4, 6 and 7). These one-way information flows were essentially managed through either online networking sites or online forums where the interviewees sourced and/or gathered knowledge, and the flow of information was one-way toward the interviewee. A comment offered by the graphic designer (Interviewee 4) suggested that accessing online forums was the best way to help her in problem-solving or to address particular job related issues: “there will be so many different answers you might find online ... forums you know will answer all your questions” (I04), or, as suggested by the chief technological officer (Interviewee 2) from the applications and digital publishing business, “I’ve either found them through a Google search or somebody else has found them and they’ve passed them onto me” (I02). These comments would suggest that the one-way flow of information toward the interviewee was particularly relevant as it met a particular skill and/or professional development need, and these interviewees felt that sourcing the information through some form of online resource best met their needs. Of particular note, the network diagram for the games studio general manager (Interviewee 8)
shows one-way communication from him to a person at an education institution. He noted that he mainly interacted with her via email in a mentoring capacity, where he provided assistance and guidance in business related matters.

These findings strongly support the claims made by a number of writers that online communications and networks can be an excellent substitute for physical proximity and also allow for rapid feedback between individuals (for example Dutton, 2008; Haythornthwaite, 2000; Grabher & Ibert, 2006; Rajagopal et al, 2012). Haythornthwaite (2000) adds that online communication provides for simultaneous or concurrent information exchange as well as asynchronous exchanges at different hours of the day, even across different time zones, and supported group discussion forums. In a more general sense, Grabher & Ibert (2006) argue that personal ties support personal knowledge development for professionals. They note that personal knowledge networks not only contribute to a person’s development but also provide access to industry peers and work colleagues, which facilitate information and knowledge exchange. Dirksen et al (2010) add to this and argue that a combination of interactions through both online and face-to-face modes provides a better work-related context of information and resources, and suggest that these resources could include people, systems and texts, and argue that information flow could also include person-to-content (such as access to an online site), which can offer information concentration. In summary, the network diagrams suggest that the flow of information, either through an online or a face-to-face mode, provides for connections to meaningful context-related information requirements for a person’s knowledge and professional development. The interviewees heavily called on access to online content as well as sharing information with clients, industry peers and work colleagues, and that on average their network consisted of nine relationships.
Discussion

Industry professionals would seem to benefit from engaging and interacting with other professionals using professionally-based learning networks to progress their skill and professional development. In developing and maintaining these professionally-based networks, learners are able to maintain connections related to their professional interests as well as meet their immediate professional learning needs. The network diagrams would seem to support the contention of Rajagopal et al (2012) that engaging and interacting with other professionals has a direct impact and relevance on the person’s work, and allows the learner to engage with other professionals for their educational benefit. The literature suggests that professionally-based networks are practitioner-oriented and are useful in developing better practice within professions (see Bessant & Tsekouras, 2001). It could be argued that this finding has demonstrated the value that should be placed on industry-based relationships, but it could also be argued that professionals should engage in this type of relationship in order to progress their professional currency. However, in contrast some interviewees did not engage with other industry professionals. Based on this finding, it would appear that the claims made by Bessant & Tsekouras (2001), that interacting with other industry professionals increases professional knowledge, does not appear to be a universal approach for all industry professionals. As such, it is suggested that their skill and professional development requirements are impacted by their inability to engage with other industry professionals.

The use of online personal networks should form part of a person’s ongoing skill and professional development plan. The network diagrams clearly showed that online personal networks are one of the dominant approaches used by industry professionals to progress their professional currency and is particularly helpful in engaging with industry peers. It was found that online personal networks helped build and maintain connections with a variety of contacts, and assisted in the development of skills and competence, particularly through some
form of online platform. Online networking sites in particular were found to provide a platform where people could connect and facilitate their learning, and was found to be essential in maintaining personal and social relationships when separated by distance. This finding is supported by the literature, which points to the value and role of online personal networks as an aid to a person’s professional development, and it provides an avenue for facilitating a person’s ongoing learning by maintaining and developing these connections (see Dabbagh & Reo, 2011b; Dunlap & Lowenthal, 2011a; Rajagopal et al, 2012). This was particularly evident in some of the network diagrams, where the interviewees relied on online networking sites to connect with overseas contacts. Given this finding, it could be argued that the key factors in maintaining an online connection include the suitability of the person’s expertise in the topic and the personal attachment between the individual and the person. Based on this finding, three conclusions can be made on the use and relevance of online networks: (1) that information and knowledge on programming, software and technology related topics are best sourced from an online resource as it provides the immediacy of just-in-time access; (2) that online networking sites are widely used by industry professionals to support and aid their learning and skill development; (3) online networks add weight to the notion that social and networked learning are important approaches for industry professionals.

Participation in communities of practice is a socially-mediated practice and, as such, should be considered to be an important approach for a person’s informal learning strategy. Communities of practice have been identified as a socially-based informal learning approach, and are well organised and active, particularly in the technology and games sectors of the industry. The network diagrams show several interviewees felt a community of practice met their learning and development needs, as they could meet face-to-face with people outside the business and it afforded them opportunities to interact with other industry professionals. The
communities of practice of these interviewees took the form of formally organised or convened face-to-face sessions, informal meetings and group sessions, which supports the face-to-face informal learning approach made by Wenger (1999, 2010). The value of communities of practice as an informal learning mechanism also pointed to the role they play as a socially-based approach to facilitate ongoing learning. It was argued that learning is a matter of developing social relationships like a community of practice, and that learning occurs in everyday practices and in various work groups, or situated within the workplace (Billett, 2002; Lave & Wenger, 1991). The network diagrams and the comments of the interviewees point not only to the role of communities of practice as an informal learning approach, but also that learning occurs through socially-mediated group participation. While this finding shows that communities of practice within the technology and games sectors are active and well-organised, the result also shows a relationship clearly exists between participation in social practice, such as a community of practice, and informal learning as it relates to a person’s work context. However, while it may be possible to draw some conclusions from this finding, it could be argued that generalisations cannot be made given the small sample size that has an over-representation of some industry sectors in the interviews. This could be an area of future research with a larger number of interviewees from a wider cross-section of industry sectors.

Horizontal learning paths by interacting with work colleagues are important for professionals who work in project-based businesses. This form of learning network offers the learner a climate in which to integrate their learning with their work function. The horizontal learning approach to learning also affords the learner the ability to interact with their work colleagues in areas such as project-specific issues and problem-solving. The network diagrams show this was particularly relevant for those in the games sector. Given the project-based nature of work in the games sector, the reliance of these interviewees on their
Horizontal networks would seem to be applicable as it suited their particular work environment. It was found that the main reasons the games sector professionals needed to engage with their work colleagues was in the areas of problem-solving, project-related work and games specific issues. This finding would seem to support the contention of Poell et al (2000) that horizontal learning networks were particularly relevant for problem-solving as it offers the learner a climate in which to integrate learning with their work function, as it involves complexity and collaboration with other people in project teams. In fact, Tak (2008) also suggests that learning in the workplace, particularly through project-based work, can be a valid learning method. Billett (2002) and Lave & Wenger (1991) agree, in that workplace situated learning does, and can, occur in workplace settings, and is an effective learning approach. Given the predominance of businesses that operate on a project-by-project basis in the industry (CIE, 2005) it could be argued that this is a particularly significant finding in that digital content industry professionals working in micro businesses would typically need to rely on project-based workplace learning in order to maintain and progress their professional currency. However, while it has been argued that project-based learning is a valid informal learning approach, questions such as what makes project-based learning in the workplace relevant and conducive to learning could be further explored to better develop more effective ways to support and promote informal workplace learning.

High intensity relationships or strong ties were maintained through face-to-face meetings, online networking sites and online forums. The network diagrams showed that this form of interaction provided frequent and timely access to information and it allowed the exchange of useful information between individuals and/or groups. The high intensity relationships represented in the network diagrams would seem to confirm the contentions of several writers that high intensity relationships aid the receipt and sharing of useful knowledge, and are particularly relevant in the exchange of complex technically-based topics
such as Haythornthwaite, 1996; Levin & Cross, 2004; Petroczi et al, 2007). The value placed on high intensity relationships by the interviewees would also seem to support the contentions of other literature (such as Lin & Bian, 1991) that high intensity relationships provide a conducive environment for information and knowledge flow between individuals, and it is through their intimacy and frequent interaction that a high intensity relationship offers positive learning outcomes for individuals and groups alike. So, based on this finding it would seem that high intensity relationships are instrumental in providing relevant knowledge and therefore should be part of a person’s ongoing professional development plans. However, the network diagrams show that not all interviewees relied on high intensity relationships. It has been argued that maintaining intimate relationships requires too much effort and could leave individuals isolated without access to others who are willing to share information and knowledge, which may affect a person’s ability to continually maintain high intensity relationships (Haythornthwaite, 2000). From the network diagrams, it can be concluded that high intensity relationships lend themselves to the exchange of certain types of information and knowledge, such as work-related skills, which typically include online game development and production, software and programming knowledge such as Scala, Java, and Action Script, iphone and Smartphone apps development, and designs.

Low intensity relationships, or weak ties, were found to be just as important as strong ties in terms of knowledge sharing. It was found that these types of relationships provided access to new information from a different set of individuals and, in some cases, through different interaction methods. A number of writers argue that weak ties support and aid high intensity relationships to not only better serve information and knowledge exchange but to provide access to new information though interactions with different individuals and contacts (see Burt, 1992; Granovetter, 1973; Haythornthwaite, 1996). The network diagrams show that the interviewees did in fact supplement their high intensity relationships with low
intensity relationships by interacting within their respective networks, particularly with industry associations, work colleagues and educational institutions, to develop and source new information and knowledge. This result would seem to support the claims made by some writers that it is not the strength or weakness of a tie that contributes to the information exchange but, rather, the nature of an individual’s connectedness within one or more people in their network, which affects their exposure to specific kinds of information (Granovetter, 1973). It could be suggested that industry professionals must maintain a variety of high and low intensity relationships in order to share and/or source relevant information as a way of progressing their personal development. What the network diagrams also show is that through each type of relationship, the individual was further connected with other networks, which would also impact the kind of information and/or knowledge they were able to access.

Network size and characteristics vary based on the number of relationships maintained by a person. It was found the interviewees on average interacted with at least nine people to share and/or source information and knowledge as part of their informal learning networking arrangements. The number of relationships, or range, was discussed by several writers. They contend that a person typically maintains seven relationships within their respective networks (for example Garton et al, 1997; Hogan et al, 2007). The size and diversity of the different network diagrams not only added to a better understanding of how informal learning networks operate but also provided a useful approach to building a picture of the typical industry professional’s network structure. While this was evident in most of the network diagrams, it was not the case for all the interviewees. The network diagram for the sole trader showed she had six actually-occurring relationships, the majority of which were via websites. This result leads to several issues that may impact on the ability of learning networks to support the ongoing development of sole traders and other individuals working in micro businesses: (1) whether this finding is peculiar to sole traders within the industry; and
(2) how do sole traders promote their professional currency. Therefore the role and
approaches of skill and professional development for sole traders is an area that could require
further study. Another claim made in the literature (see Garton et al, 1997) is that larger
networks have a more varied set of characteristics, such as its members, the information
shared and the mechanisms of interaction, while smaller networks have a narrower focus of
topics and has fewer forms of interaction. Elements of these claims appear to be evident in
some of the network diagrams and could be further explored in a future study with a larger
set of participants.

Two-way flow of information is best managed through face-to-face discussions and
by utilising some form of online technology. The network diagrams show that all the
interviewees engaged in some form of face-to-face discussion, while five interviewees
reported the use of some form of online technology as a mechanism to facilitate the flow of
information within their respective networks. The face-to-face learning strategies employed
by the interviewees involved relationship building with people, within and outside their
business, with similar interests, which enabled the two-way flow of information. Online
interactions were enacted through networking sites, such as twitter and LinkedIn, forums and
email. The findings support the claims made in parts of the literature that face-to-face
discussions are able to strengthen the bond of the relationship and allow for reciprocal
interactions, while online networks are an excellent substitute for physical proximity and
allows for rapid and frequent exchange of information between individuals (see Dunlap &
Lowenthal, 2011a; Dutton, 2008). These findings also suggest that for the interviewees, their
personal networks not only contributed to their development but also provided access to a
variety of contacts, such as industry peers and work colleagues. It could be argued, based on
this finding, that the flow of information within a person’s network is directly related to the
strength of the relationship and thus an individual should use a variety of media to not only
support the flow of information and knowledge but also to utilise the best approach that suits
the information and/or knowledge they are seeking.

Technology and software related topics were found to be particularly important for
the majority of interviewees. The network diagrams show a link between the interviewee’s
role, their business function, the importance to progress their programming, software and
technological knowledge, and how they utilise their networks to source and share knowledge
identified as being directly related to maintaining their currency in these areas. While it
became apparent that programming, software and technological information were the
dominant topics discussed by the interviewees, it was also apparent that not all the
interviewees felt that programming and software, and technology-related topics were the key
focus of their skill and professional development. It has been argued that software and
technology-related topics are important generic skills for workers in the industry, and this
also true for workers in the 21st century, given the ongoing advances of technology within
industry in general. It can be concluded that professionals need to continually progress their
software and technological currency and that these skills should be considered an important
skill requirement for any professional in the industry.

Finally, it was found that the games sector is a specialised sector within the industry
and games related topics were particularly relevant to professionals working in that sector of
the industry. However, it could be argued that this is a model that should be considered by all
industry professionals as a means of actively seeking job and sector-related information. It
supports the claims made in parts of the literature that by engaging within their respective
networks a focus is provided on their respective professional field while enhancing learning
and development opportunities.
Summary

This chapter documented and analysed the respective learning networks of the interviewees in addressing research questions three and four. This part of the study identified and documented the role of informal learning networks and the role they play in the ongoing skill and professional development of micro business digital content industry workers. This chapter also reported on the relevance of the number of relationships and the intensity of the relationships, and concluded by reporting on the flow of information within the respective networks.

It can be concluded that the network diagrams show that engagement with professionally-based networks and online personal networks, and participating in communities of practice greatly assist an individual’s skill and professional development, and d appear to be highly valued by professionals in the industry. The network diagrams also show that industry professionals manage their ongoing skill and professional development through high and low intensity relationships that provide access to a wide variety of information, knowledge and contacts.

The next chapter will provide a synthesis and discussion of the survey and interview findings.
Chapter 7

Discussion of findings

Introduction

This research study aimed to examine the link between professionals working in a micro business setting in the digital content industry and how by accessing their social and business relationships they can contribute to their skill and professional development. To achieve this aim, two phases of fieldwork with industry professionals were undertaken: an online survey and semi-structured interviews. The previous chapters have presented findings from the online survey (Chapter four) and semi-structured interviews (Chapters five and six). This chapter will integrate the key theoretical underpinnings and the literature reviewed in Chapter two and synthesises and discusses the findings from the two phases of this study. Based on the broad overall aim of the study and the subsequent literature review, four research questions were developed, which will be presented in this chapter:

1. What are the key skill and professional development requirements of digital content workers in micro businesses?
2. What approaches do they undertake for their skill and professional development?
3. What is the role of the informal learning network in digital content worker’s skill and professional development?
4. How do these informal learning networks operate?

In order to best examine the implications and relevance of this study, the survey and interview findings will be examined in relation to several factors: the research questions; the implications for educational systems; the relevance to learning network typologies; learning challenges for industry professionals; the network mapping methodology; and the relevance of this present study to the industry.
Addressing the research questions

Skill requirements

The survey respondents and the interviewees alike identified three broad sets of skills required for industry professionals: job-related, generic, and meta-cognitive skills. The research participants identified a range of skills they saw as being important for people working in the industry: business management, communications, technical ability, software knowledge, networking with others, creativity, entrepreneurship, project management, and keeping abreast of industry trends. These findings provided some confirmation of the core skills needed by industry professionals that were suggested in reports by Australian Interactive Media Industry Association (AIMIA, 2005) and the Centre for International Economics (CIE, 2005). The findings were also reflective of several skills lists and taxonomies identified in the literature (such as Mumford, Peterson & Childs, 1999; NCVER, 2003) that work-related skills can be defined at varying levels of generality or generic type skills, and are directly related to occupational or job-related type skills.

Another facet of skill requirements that emerged in the literature review, which was highlighted in the course of the interview analysis was the relevance and importance of skills and competencies required for workers to effectively operate in the 21st century. The literature suggests that workers in the 21st century should be focused on knowledge development in areas such as digital-age literacy, inventive thinking, effective communication, and high productivity, which, it was argued, are crucial and particularly relevant for professionals in the digital content industry (for example Voogt & Roblin, 2012). The interview findings in particular provided weight to the discussion by Dede (2010) who argues that 21st century skills differed from the so called 20th century skills due to the emergence and development of sophisticated information and communication technology (ICT). It was proposed during the literature review that, given the rapid advancement of ICT
and the changing nature of the types of jobs, a diverse skill set was critical. The findings of this study would seem to reinforce this point.

The interviews clearly identified that professionals also need to possess higher-order or meta-cognitive skills to support their generic and job-related skills and, as such, workers need to identify and develop ways of learning to learn. Claims made in the literature suggest that learning to learn is the willingness to adapt to novel tasks through effective, and cognitive self-regulation forms the core of learning-to-learn (Hautamäki et al., 2002), and also that learners should utilise the best learning strategies to achieve their learning goals (Entwistle & Ramsden, 1983) and should be present within a person’s development plans. The study’s findings in this were reflected in the claims made by Partnership for 21st Century Skills (P21, 2006), where it is suggested that learning to learn skills needed for workers in the 21st century include critical-thinking and problem-solving, communication, creativity and innovation, collaboration, contextual learning, and information and media literacy skills. This finding has implications for professionals working in the industry and educational systems alike to better support learning in this area. The implications will be discussed later in this chapter.

What also became apparent in the course of the study was the link between the skill requirements and learning approaches.

*Approaches to skill and professional development*

The research identified a number of approaches that best served the development of skills and provided for ongoing professional development. The survey and interview findings strongly reflected five dominant approaches: the use of various online technologies, face-to-face discussions, the role of social relationships, self-directed learning, and formal education and training.
Divergent views were identified across the two phases of the study on the role of formal education and training. It was felt that short courses provided an immediate skill development, qualifications that were important to do the job, and that formal education and training did not meet the learning needs of some research participants. The survey findings provided a clear indication that completing a short course was considered important, as it met an immediate skill and development need for the learner. Another view revealed in the research was the value of a formal qualification as a requirement for working in the industry. The research findings strongly supported the claims made by AIMIA (2010) and Innovation and Business Skills Australia (IBSA, 2009) that professional short courses provided learning outcomes on specialist types of skills and techniques, such as information technology (IT) and software currency, while it was also argued the higher education sector should be more focused on developing high level 21st century capabilities, such as creativity, adaptability, information management, and digital competence (Plomp, 2013). These findings add weight to suggestions made by many research participants that having some form of qualification was essential to being able to work in the industry. It was considered that degrees were advantageous and that graduates should know how to learn. However, a critical issue that was raised during the interview phase was that universities were out of date, formal courses were inflexible and not responsive enough, and that a mismatch existed between what is taught at educational institutions and the roles required in the industry. As much as higher education is needed in the 21st century (Cobo, 2013) it is arguably less relevant than ever before (McWilliam, 2009). Therefore, to meet the needs and challenges of the 21st century, universities must reinvent their structures and programs, and their curricula and pedagogic practices. This finding is also significant as it directly relates to the skill requirements for professionals, which were discussed earlier, as well as having implications for education institutions. These implications and issues will be discussed later in this chapter.
The role and function of learning networks

Central to the discussion of the approaches to skill and professional development undertaken by industry professionals was the use of their respective networks for sourcing and/or sharing information and knowledge, and topics, as it related to their ongoing professional currency. Eight topics were identified by the interviewees. However, four topics in particular were shown by the respective network diagrams as being the most significant in terms of information sourced and/or shared: programming software, industry and future trends, technology, and online games. The network diagrams and, indeed, the survey findings support the claims made in the literature that industry professionals need to possess such generic skills as programming and software and technology, and also reinforces the notion that there are skills that should be considered core skills for all industry professionals, which should, and must, form part of a worker’s ongoing development in order to effectively operate in the 21st century.

The ability to be able to source and/or share knowledge and information within a person’s network was found to be affected and supported by the nature of the relationships a person is able to interact with and manage. They were based on business and social relationships, and showed that the informal nature of these networks played a significant role in the skill and professional development process. In fact, across many of the interviews there was evidence that clearly pointed to the value of business, social and personal relationships in order to develop and build knowledge, to further develop an understanding of individual sectors of the industry, and for being able to stay connected with people in the industry. The learning network diagrams indicated that professionals relied on high intensity relationships or strong ties within their respective networks, as they provided the interviewees with access to frequent and timely exchange of information and knowledge between the individuals. This research finding strongly supports the contentions of a number of writers that high intensity
relationships provide an environment for information and knowledge to flow between individuals (for example Granovetter, 1973; Haythornthwaite, 1996; Lin & Bian, 1991). It is also suggested that the value of these high intensity relationships lend themselves to the development of more skill-related topics.

However, what also became evident was that not all interviewees relied on high intensity relationships. It was reported that professionals also engaged in low intensity relationships, or weak ties, in order to gain access to new information and knowledge through industry associations, work colleagues and educational institutions. This finding adds weight to the claims made in the literature that it is not just the strength or weakness of a tie that contributes to the information exchange, but, rather, the nature of an individual’s ability to interact within one or more people in their network that affects their access to specific kinds of information and knowledge. What can be drawn from these two findings is that industry professionals must maintain a variety of high and low intensity relationships in order to be able to share and/or source a wider range of information and knowledge in order to progress their skill and professional development.

In addressing the four research questions, this research has clearly supported the basis for this thesis, which stated that professionals working in micro businesses must engage in some form of informal learning in order to promote and progress their ongoing currency within the industry. It was suggested at the outset, and has been shown in the course of the findings, that in order to achieve this they would need to engage and interact with their business and wider social relationships and networks. The nature of their work and the industry would seem to suggest that professionals preferred, and indeed engaged in, two prime informal learning modes: face-to-face and through some form of online technology. Formal education and training (such as TAFE and university qualifications), on the other hand, while not an informal learning approach, were seen to promote an individual’s longer
term professional development requirements, as qualifications are advantageous, and highlighted the value of completing course work.

**Implications for educational systems**

The research identified a range of views existed as to the relevance and importance of formal education and training. A majority of the survey respondents, and a number of interviewees, felt that a formal qualification was important for working in the industry, and a majority of survey respondents had completed short courses. However, a set of interviewees felt ambivalent about university courses as preparation to work in the industry, and felt that university courses provided relatively little added value. These findings have several implications for education institutions engaged in the education and training of industry professionals: the value of professional short courses, registered training organisations (RTOs) and technical and further education (TAFEs), and universities.

**Professional short courses**

Through industry partners, professional associations, private colleges, and some universities, professional short courses offered industry professionals the ability to develop their skills and practices and to stay current with industry trends as part of their ongoing development. The literature showed that short courses cover a broad range of sectors and occupations within the industry, including animation, games, marketing, film and TV, graphic design, information technology web and mobile media, and visual arts (see AIMIA, 2010; Haukka, 2011; IBSA, 2009). Typically, it was found that these types of courses were delivered over a period of between two and ten days and addressed skills such as digital marketing, iPhone, iPad and Android development, Java programming, databases, social media marketing, and various computer software packages.

The survey findings were very clear; the respondents reported that they completed a short course in order to address their skill development in areas such as technical and
technological skills, web development, networking with others, staying up-to-date with industry trends, and business management. Based on these findings, short courses offered the ability to offer the learner quick learning outcomes through a short, sharp, focused program that provides the necessary skill development related to their work function. From an institution perspective, it would appear that the current course offerings from the various institutions do in fact address the skill requirements of industry professionals and appear to be addressing the suggested skill deficits within the industry (AIMIA, 2005; CIE, 2005).

Consequently, in the continually changing industry environment in which these professionals work and operate, it should be considered imperative that professionals engage in this form of skill development, and that employers need to support this by funding, or partly-funding, this development approach as micro businesses and professionals move along the path of skill development.

**Vocational education and training**

The vocational education and training sector in which RTOs and TAFEs operate is differentiated from the higher education sector by its focus on training for skills development and manual or practical activities. They are traditionally non-academic and relate to a specific occupation or vocation (Department of Education, Employment and Workplace Relations, DEEWR, 2003). In the course of the literature review, a number of competencies and qualifications were identified that encompassed the various occupations within the digital content industry under a national curriculum (see IBSA, 2009). The occupations and qualifications included game design, digital media design, game art and animation, 3D and digital effects, interactive media; virtual worlds, multimedia development, web development, programming, games production and testing, and business management. Four main qualifications and training packages of competencies were identified for digital content industry professionals: business services, screen and media, information and communications
technology, and graphic art. The course competencies, learning outcomes and qualifications were truly reflective of digital content industry occupations, which encompass skills such as creative thinking, design, innovation, micro business operations, customer contact skills, and learning and capability development.

The research overwhelmingly found that qualifications were not only important for many of the research participants but were also considered a requirement to work in the industry, as it has relevance and meaning in the industry; it aided the development of an individual’s skills and competencies by gaining some form of qualification; and further developed their generic and meta-cognitive skills, such as learning how to learn.

Clearly RTOs, TAFEs and the wider vocational education and training sector are offering and delivering qualifications and professional development opportunities and programs that meet the requirements of industry professionals. Industry professionals appear to see a real value in this form of qualification with over 36% (n=68) of survey respondents holding some form of vocational education and training qualification, despite what is argued by Raffo, Lovatt, Banks & O'Connor (2000) that formal education and training offer no relevance and do little to enhance the skills of professionals working in micro businesses. Raffo et al (2000) also argue that higher education and vocational education courses provide little in terms of current and future skill requirements, and that to effectively work in the industry, professionals need to move beyond gaining a qualification and to supplement their skill development through reciprocal exchanges of information and knowledge through an informal learning setting.

What is also evident is that RTOs and TAFEs meet and deliver on the development of broader generic skills, such as business management and marketing; however, the research participants did not see formal education and training as the prime avenue in developing the 21st century skills suggested by Binkley et al (2010), EnGauge (2003), International Society
for Technology in Education ICT (ITSE, 2007), Jenkins et al (2006) and P21 (2006). It is claimed that skills such as creativity, innovation, critical thinking and other higher-order skills are essential for 21st century professionals. From the interview findings it was acknowledged that these higher-order skills were indeed important for industry professionals and offered an opportunity for RTOs and TAFEs in a number of ways: (1) to better tailor and develop their education and learning programs that encompass the core industry skills requirements as part of their course offerings; (2) to better develop assessment and evaluation tasks to measure and evaluate competency in these areas; (3) to enable smaller RTOs and TAFEs to offer specialised digital content courses that include the most important skill requirements for industry professionals; (4) to pay more attention to flexible learning approaches, for example to change focus from what is learned to teaching how to learn, by developing new methods of learning and teaching.

**Higher education**

The research found that higher education accounted for a small number of survey responses, while several interviewees pointed to quite a disjunct between the university course and the needs of the industry professional, particularly in the lack of interest and focus of technological currency and the slow and long period of curriculum development. The findings of this study reflect the outdated state of the higher education system, which, in part, is still shaped by the old industrial paradigm characterised by a standardised, mechanistic style of teaching, learning and assessment (Barry, 2010). What this study has shown is that professionals see the value of a higher education qualification and learning; however, they also feel that there is a widening chasm in the development and learning outcomes offered by universities for digital content professionals, and this should be a wake-up call for the higher education sector to reimagine themselves in how to better meet the capability development of these professionals.
Based on the preferred learning approaches of the interviewees from this study, a hybrid model of university learning is proposed that focuses on 21st century skills while also accommodating the informal nature of learning preferred by industry professionals. From an instructional design, learning and teaching paradigm, it is essential that universities move from a theoretical paradigm to a more real world view (Cobo, 2013) in the following ways: (1) instituting instructional and teaching ideas that complement both in-class and on-the-job education and which enables the attitudes, skills and knowledge of the learners; (2) considering more flexible and personalised approaches to learning that incorporates more adaptive 21st century notions of higher-order skill development; (3) integrating meta-cognitive and learning to learn skills into the formal education framework; (4) the curriculum should be a hybrid of core generic skills coupled with opportunities to branch off to other interests and/or contexts by developing transdisciplinarity skills which provides for knowledge development between disciplines; (5) the better use and application of technology which affords the learner access to just-in-time information and the ability to interact in more informal contexts; (6) industry must play a more active role in course and curriculum development and provide connections to industry currency.

A massive opportunity exists for universities to be online mediation and knowledge brokers. Like the digital content professionals, it is clear that universities must also position themselves to be more adaptive and reflective of the different industry requirements by facilitating and supporting physical and online knowledge networks. This could be best served by finding a point of difference and value-add for these professionals, possibly through better industry connections that integrates the latest research and synthesises industry trends, while also emphasising the assessment of 21st century skills and processes.
Relevance to learning network typologies

The study clearly showed that professionals essentially engaged in two modes of informal learning: online and face-to-face.

Online technologies

The use of various online technologies, predominantly social networking sites, forums, news and aggregation sites and online forums, was identified by the vast majority of research participants. For a great many professionals this form of learning afforded them access to the development of different skills, and the opportunity and/or need to learn was affected by a requirement for just-in-time learning by accessing some form of online technology. In fact, some interviewees commented that a major reason online social learning was so appealing to them was that it was often passive, which aided their ability to incrementally build knowledge. These forms of online social learning were less likely to employ a community of practice, but, rather, used a distributed learning network of interested people, such as other professionals, work colleagues and industry associations (Albors, Ramos, & Hervas, 2008; Dutton, 2008). The research identified a difference between what was sourced through an online mode and that which was sourced from a face-to-face discussion. Based on the interviews conducted in this study, the online mode offered professionals greater access to just-in-time expertise and knowledge on skills in such areas as programming, software and industry trends, and gave access to content that went beyond the workplace boundary and removed any geographical constraints. It is also clear that this form of social learning affords the learner access to quick and timely access to information and knowledge, in which is particularly important given the ongoing and constant changes faced by industry professionals in the digital era, especially in areas such as programming and software changes, and web and applications development requirements.
Given these findings, it is clear that this form of social learning is relevant. It is (at least initially) passive in nature, and then becomes more active as the professional follows up on something that piques their interest. Universities, however, emphasise very active modes of learning. Ultimately, online social learning has highlighted several imperatives for industry professionals. Firstly, the use of online technologies reinforces their capability, as it contributes to better development of skills and knowledge in a changing and unpredictable industry. Secondly, ICT is, and will be, one of the main drivers for changing job structures and requirements, and will determine what skills people need to acquire. Finally, the importance and value of online technology in social learning is summed up by Cobo (2013), who argues that competencies and skills required for working must include meta-competencies of different skills, technological literacy and a strong focus in digital media literacy. From this study it became clear that micro business industry professionals must possess a range of generic, job and sector specific skills, and they must continuously develop their ability to learn to learn.

**Communities of practice**

The idea of engaging in face-to-face discussions within communities of practice featured quite prominently in the interviews, where it was identified how they were active members of communities of practice and that these communities of practice took the form of formally organised or convened face-to-face sessions. These communities of practice took the form of organised face-to-face meetings and group sessions, and were highlighted by three types: professionally-based networks, specialised communities and workplace learning.

The predominant mode of a community of practice used by these professionals was to engage and interact with other industry professionals. The network diagrams showed that by developing and maintaining these professionally-based networks, the interviewees were able to maintain connections related to their professional interests, as well using this form of
learning network to meet their immediate professional learning needs. Across all the
interviews, there was evidence of interactions with industry contacts for different reasons and
professional development requirements. The second form of community of practice involved
specialised technological, business and sector-based communities, involving regular group
meetings with specific specialised aims as well as casual and ad-hoc meetings. The final
mode that was identified was that of the workplace-based horizontal learning path (Poell,
Chivers, Van der Krogt, & Wildermeersch, 2000). The workplace-based community was
particularly relevant for those working in project-based businesses. However, this also has
wider relevance to other micro businesses as it is the predominant form of micro business
operation. A feature of this form of work-based community of practice is that it allowed
people to integrate their learning with their work function in the workplace, and emphasis
was placed on problem-solving and project-specific issues.

Quite clearly, this form of informal learning was one of the preferred learning
methods for professionals, as they relied on business and personal relationships based in the
face-to-face mode. This form of face-to-face learning involved active relationship building
and maintenance between individuals within and outside the business. Communities of
practice involve repeated and extended reciprocal interactions, and are fairly time and energy
intensive, but from this study it was found they were essential, indeed central, to professional
currency and career development. Based on these findings, it is suggested that participation in
communities of practice points to the value of socially-mediated group participation and
learning, and, as such, could be considered an important approach for a professional’s
ongoing skill and professional development plan.

This study has provided sufficient evidence for the importance and value of social
relationships and how they contribute as an informal learning strategy for industry
professionals. Lave & Wenger (1991) and Wenger (2010) argue that learning occurs through
interaction and participation, through active relationship building within and outside of business, and that informal learning has no curriculum per se and tends to be opportunistic and unstructured (Eraut, 2004). Given this study’s findings, there are several implications for both the industry and industry professionals. Firstly, industry and sector associations could be more active in facilitating various sector-based communities of practice, to better assist access for professionals to regularly scheduled face-to-face meetings. These could take the form of meetings that focus on topical industry or sector issues. Secondly, industry professionals working in micro businesses could consider engaging with their business and/or social relationships as part of their ongoing strategies to acquire skills, not only as part of their initial foray into their role and the industry but also to ensure their ongoing professional currency within the industry. Wenger (2010) supports this approach. He states that communities of practice are an excellent strategy for peer-to-peer learning among practitioners, as they link professional practice with learning.

**Learning challenges for industry professionals**

While it was found that industry professionals engaged in some form of informal learning, as well as interacting with their social relationships, in the course of the interview analysis, the strongest themes that emerged related to the need to continually learn and relearn due to the sheer rate of change within the industry. From this, several learning challenges and imperatives became apparent: currency versus best practice, generalist versus specialist skills, creativity versus commercial outcomes, and learning opportunities as opposed to less opportunity to learn.

**Professional currency versus best practice**

Evidence emerged in the interviews of the need for professionals to be able to balance their professional currency with industry best practice, which some interviewees suggested was due to constant change within the industry and the need to be able to stay up-to-date with
industry trends. The majority of interviewees identified a strong link between industry trends and best practice, which they addressed through interactions with other professionals, by attending conferences, through interactions with professional associations, or even through clients. In fact the majority of interviewees felt they were able to maintain their industry currency by keeping abreast of emerging and current trends by interacting with trusted industry peers and industry associations. As one interviewee noted: “it’s in your best interest to be on top of things ... where the industry is heading and what’s new and popping up” (I03). These findings support the claims made by Bessant & Tsekouras (2001) and Rajagopal, Brinke, Van Bruggen, & Sloep (2012) that learners should engage with industry-based connections in order to meet their professional needs by pooling and sharing their knowledge and experiences with other industry professionals, and by interacting with industry associations. Ultimately, the challenge for industry professionals is to be able to find a balance between staying current in their job, keeping abreast of what is happening in the industry and how it affects their job, and their ongoing development.

**Generalist versus specialist skills**

Across several of the interviews there was evidence of a link between being able to find a balance between having generalist skills and developing specialist skills, while also needing to have some level of depth and diversity. This was summed up by one interviewee who suggested: “so you do need some specialists, someone with a deeper knowledge in that area ... but all these guys have got skills in different areas as well” (I02). This tension between generalist or generic skills and specialist skills is highlighted in the literature (see Dede, 2010) where it is argued that finding a balance between generalist and specialist skills is due to the growing presence of information and communication technologies (ICT). The nature of skill requirements have changed from that of possessing a range of generic skills to that of possessing and developing a wider more diversified set of skills and competencies: “to
actively and effectively participate in the knowledge society” (Voogt & Roblin, 2012, p.300). These skills and competencies are generally characterised as not being linked to a specific field but which are relevant across many fields, and are associated with skills and behaviours that represent the ability to cope with complex problems and unpredictable situations.

From this discussion, a model for competency development could be suggested that would best serve the ongoing development of industry professionals and which would take into account the breadth and depth of work functions. The model described by Cheetham & Chivers (1996) provides an excellent guide to skill and professional development. In their model they describe three components that should form part of a person’s broader competency development: meta-cognitive skills, technical job specific knowledge, and functional and analytical knowledge. In this model, Cheetham & Chivers (1996) suggest that meta-cognitive skills should form the overarching prerequisite of a person’s development. They argue that these types of skills, which include communication, creativity and problem solving, should be considered core skills for any worker and learner. A second consideration for industry professionals should be the integration of job-related skills into their development, one that focuses on the technical nature of a role within a professional, business and industry setting. Finally, functional knowledge and competence should include broader organisational and analytical skills, which also take into account the nature of a person’s social and intra-professional relationships. In summation, given the findings and the model offered by Cheetham & Chivers (1996), an industry professional should be looking to develop a broader, more diverse, skill set, through an integration of various components, in order to sustain their professional competence in a rapidly changing industry.

Creativity versus commercial outputs

The ability to balance the creativity process while also having a commercial focus emerged as another learning imperative for professionals. The interviewees highlighted the
importance of creative skills within the industry, and clearly showed the importance of creativity as part of a professional’s skill set. In the process of conducting the interview analysis, the interviewees discussed idea creation and generation, with a commercial focus. The need to balance the commercial focus and the creative process is important as an industry professional needs to be able to offer a diversified set of products and services to clients by managing client expectations and translating the client’s requirement from idea and concept into reality.

The importance of, and indeed the role of, creativity in the industry was discussed in the literature review. Writers such as Caves (2000), Cunningham (2002) and Hartley (2007) all argue that creativity is a core skill requirement for all professionals in the creative industries. This view was reinforced by the 21st century skills frameworks that argue for creativity and communication capabilities being considered core skill requirements for people working in innovative type roles. This finding also emphasises the claims made by Voogt & Roblin (2012) and a number of the 21st century skill frameworks (for example Binkley et al, 2010; EnGauge, 2003; Jenkins et al, 2006) that working professionals need creativity skills not only in areas such as communications but also in those areas that have a direct impact in being able to develop relevant and high quality products in the commercial sector.

More learning opportunities as opposed to less opportunity to learn

The interviewees were very aware of the need to continue their learning, although this was tempered by the fact that they needed the opportunity to be able to engage in some form of informal social learning approach. It became clear that this tension existed due to there being a huge volume of information and constant development within their particular sector of the industry, which left little time to take up any opportunity to learn. This was described by some interviewees as not being able to invest time in skills development and in the broader learning function. In fact, some interviewees had a negative view of formal education
and training in this respect as they stated that the amount of time needed to devote to a formal education and training program was a large disincentive against undertaking the program and they preferred to largely engage in some form of socially-based informal learning strategy, which was a better use of time in a fast moving industry.

These professionals identified and utilised several informal learning approaches that alleviated the issues of time and the opportunity to learn. The interviewees engaged in sourcing and/or sharing just-in-time knowledge by taking charge of their own self-development and learning by accessing online resources such as networking sites, news and aggregation sites, and forums. Another important facet in maximising their learning opportunities was highlighted in their ability to engage and interact with their social relationships. It was found this greatly assisted the exchange of information and aided the learning process as it afforded the learner access to business, social and personal contacts, which enabled the exchange of information and resources within these social groups regardless of location and time of day, and allowed for continual learning. Factors such as of networking for career building, the importance of face-to-face informal learning, and social interactions were crucial for these professionals in managing their professional currency.

However, it was found that not all interviewees engaged with their social and business networks as part of their ongoing learning and development, especially as it related to keeping up-to-date with developments and trends in the industry, and, ultimately, how it affected their professional currency in terms of their job function and career development. This could be an area for further research when a larger number of interviewees can be sourced.

In summary, the preceding discussion has highlighted the need for continual learning where industry professionals need to be able to continually construct and demolish their
knowledge structures and information requirements by accessing relevant and timely sources of information, and recognised the value of socially-based informal learning.

**Network mapping methodology**

A key innovation and contribution to the fields of network mapping and social network analysis was the development and implementation of a hybrid network mapping tool for this study. The need to develop and implement this hybrid model was based on the need to address the two research questions aimed at documenting the role and function of the informal learning networks of the interviewees.

The literature reviewed in chapters two and three outlined a number of models, approaches, theories relating to social network analysis, and methods to documenting social networks. While providing an excellent set of approaches and considerations, there was not one approach or model that could be implemented in order to document and depict the informal learning networks of this study. This study has added to the theory of social network mapping by providing not only a more comprehensive model for network mapping but also a valid approach to supporting an interview research methodology. It could be argued the network mapping approach undertaken in this study has added further detail to Conway & Steward’s (1998) model for network depiction by incorporating the views of Haythornthwaite (2000) and Hogan et al (2007) thus expanding on specific network mapping requirements.

**Study of micro business professionals in the digital content industry**

At the outset of this study it was argued that professionals working in micro businesses operating in the digital content industry needed to engage and interact with their socially-based informal learning networks in order to progress their professional currency. More importantly, this study was undertaken for two key reasons: there was little evidence of the skill requirements for industry professionals, and the lack of empirical research in
Australia relating to how individuals working in the industry manage their ongoing skill and professional development.

This study can be considered unique in its nature for a number of reasons. Firstly, the study has been able to identify a set of skills, both generic and meta-cognitive, which industry professionals should indeed possess, and aspire to further develop, in order for them to operate in the 21st century information society. In conducting this study, a fundamental finding identified by the research participants was the need for timely access to information and knowledge. This prompted a second important research finding: the use and access of online resources and face-to-face socially-mediated learning communities, where professionals are able to engage and interact with other industry professionals, work colleagues and social contacts in order to obtain quick access to relevant information and knowledge required for their jobs. As Anderson (2008) suggests, given the rise of ICTs, society has moved from the industrial age to an information society and such jobs now demand information and knowledge as a central element of work. Finally, while not claiming to be exhaustive in its nature, this study has been able to effectively map and document the learning networks of industry professionals, which in itself required the development and implementation of a hybrid model for social network mapping. The network diagrams clearly showed what information is shared and/or sourced and the types of relationships and resources industry professionals typically access in order to promote their professional currency.

However, the study also found that while higher education and tertiary qualifications were a requirement in the 21st century, professionals felt universities were less relevant and were no longer able to meet the skill requirements of the industry due to a major disjunct between the university course and the job. This should be seen as an opportunity for
universities to reinvent their structures, processes and, more importantly, their curricula to align with industry requirements and the needs of the learner in the 21st century.

Ultimately, throughout this thesis it has been shown how and why social-based informal learning networks are an imperative for professionals working in micro businesses, and the role they play in ongoing skill and professional development. Moreover, the informal learning network diagrams should form a basis not only for industry professionals to plan for their ongoing development but also for employers, business owners, and industry and sector associations to better support and progress the ongoing skill and professional development requirements of jobs and workers in the 21st century.

Summary

This chapter provided a synthesis and discussion of the survey and interview findings described in chapters four, five and six. Through the concept of informal learning networks, several key factors have emerged that directly relate to the ongoing skill and professional development requirements for digital content industry workers. In an industry impacted by constant change it was shown that informal learning is essential. The data analysis confirmed the importance of social and networked learning approaches for industry professionals working in micro businesses.

In addressing and discussing the research questions, the study found that industry professionals should possess, and indeed look to develop, not only their generic skill set but also meta-cognitive or higher-order skills, which were established as an essential skill requirement for workers and learners in the 21st century. The analysis of the data identified three approaches that best served to promote their skill and professional development: the use of, and access to, various online technologies; face-to-face discussions through communities of practice; and formal education and training. The use of various online technologies was
particularly relevant as it afforded the professionals the opportunity to access just-in-time information and knowledge.

The study concluded that in promoting their skill and professional development, industry professionals engage and interact with different forms of learning networks. This was achieved by interacting with professionally-based and online personal networks, which were identified as being the dominant forms of socially-based learning networks as it afforded the learner access to immediate information and knowledge. It was also found that communities of practice were heavily favoured as learning medium due to it being group learning based on social and workplace relationships.

A number of learning challenges and imperatives were discussed. These had implications for industry professionals, educational institutions, and industry and sector associations in terms of support and development of better skilled workers in the industry. The chapter concluded by highlighting the uniqueness of the network mapping methodology and developed a hybrid model for documenting learning networks. This study had its genesis in the fact there was little evidence as to the key skill requirements of industry professionals, and how industry professionals progress their skill and professional development.

The next chapter will discuss the conclusions and give recommendations based on the findings of this study, and it will provide a summary of the thesis.
Chapter 8

Conclusions, recommendations and summary

Introduction

The conclusions and recommendations in this chapter will draw on the findings and analysis from this present study and provide insights into the practical issues in terms of educational institutions and industry associations, and how best they can support informal learning and contribute to the skill and ongoing professional development of digital content industry professionals. This will include areas such as generic, occupational and meta-cognitive skills; the approaches that best suit the development needs of industry professionals; the importance and role of online and socially-networked learning; and how informal learning networks operate within the industry. These assertions and claims are supported by the theoretical underpinnings from the literature reviewed in the course of conducting this study. The chapter concludes by highlighting the contribution to knowledge, discussing some limitations of the study, proposing areas for future research, and providing an overall summary of the thesis.

Conclusions

This research study was primarily driven by the lack of empirical studies in Australia about micro businesses operating in the digital content industry. It was suggested that the area of informal learning is not a new topic, this study focused on the potential link between professionals working in a micro business setting and how informal learning by accessing their social and business relationships can contribute to their skill and professional development. At the outset of this research study it was asserted that professionals working in this environment would need to engage in some form of informal learning for their skill and professional development, as they do not have access to a human resources or learning and
development section that could assist in the planning and management of a more formal learning pathway.

In Chapter two, links were discussed between the creative economy, the creative industries and the digital content industry in that innovation and creativity were central tenets for people working in these environments. It also discussed how work in the industry is primarily based on micro businesses in project-based teams. In fact it was argued that individuals working in the digital content industry are at the technological, innovative and creative forefront, and face ongoing technological advices and, as such, must continually refresh and update their skills in order to maintain their professional currency.

The importance of the digital content industry was highlighted as an important direct and indirect contributor to the Australian economy and society. It is reported by CIE (2005) that the industry generated an estimated $18 billion of output in 2002-03 to Australia’s economy, employed over 300,000 people and comprised over 24,000 micro businesses (AIMIA, 2005). To this end, micro businesses and professionals operate and work at the forefront of a rapidly changing technological environment where creativity, innovation, and brand and product development are crucial in ensuring these businesses are able to meet the demands and changes while also remaining competitive in local and foreign markets. The key, then, for these businesses, and for the industry in general, is the need for an adequately skilled workforce that can turn ideas into real applications and products, and, as such, skill and professional development are crucial for micro businesses. These issues go to the heart for why this study was undertaken, as these professionals must maintain their professional currency given the challenges and pressures faced by micro businesses and the industry in general.

In order to do this, it was found that micro business professionals could access formal and informal learning approaches as part of their ongoing development. It was argued that
informal learning included activities such as self-directed learning, networking and interacting with others, and was primarily based on the individual’s learning needs. The literature concluded that informal learning can also be enacted by everyday activities such as conversations and social and business interactions.

The literature also shows that formal education and training plays an important role in the skill and professional development of industry professionals. It was shown that the formal education and training sector offers highly structured programs and qualifications, develops specific competencies and meets specific skill development needs. Formal education and training in Australia was found to be divided into university education, vocational education and training, and externally provided short courses.

The literature clearly highlights the fact that micro business professionals can engage in several forms of socially-based informal learning, which includes social networks, communities of practice, learning networks, and online personal networks. It was established that the four approaches had similar traits and had direct implication for this study: the role of the individual is vital in a network or a community, the social and business relationships of the individual play a vital role in information and knowledge sharing between the individuals; learning can be situationally-based in the workplace, profession or the industry; and online interactions encourage information sharing and make it easier for individuals to learn.

*Skills needed by micro business professionals*

The statistical analysis and findings from the online survey were aimed at partially addressing two of the four research questions, which focused on the key skills and professional development requirements and the approaches undertaken by professionals in the industry to their ongoing professional currency. In terms of skills sets for industry professionals, two broad groups were identified: generic and meta-cognitive skills. Three main occupationally-specific skill lists, taxonomies and competencies were discussed and
described, which highlighted generic skills such as planning and organising, technical and technology skills, and basic skills such as reading and writing, which were found to be 20th century occupationally-focused skills. However, it was uncovered that workers and learners working in areas that involve the rapid advancement of information and communications technologies (ICT) require a different set of skills and competencies to effectively work in the 21st century information society. Several 21st century skill frameworks were identified, which discussed and primarily focused on gathering information and information systems. The different 21st century frameworks concluded that workers should consciously think about how they learn and develop their learning. It was found that these skills would typically include learning to learn, critical-thinking and problem-solving, communication, creativity and innovation, collaboration, media literacy, and fluencies in ICT.

Through semi-structured interviews, the second phase of the data collection was aimed at partially addressing all four research questions and expanded on the survey findings. The interviews were aimed at drawing out as much information as possible in relation to the skill requirements needed for professionals in the industry, the approaches taken to their ongoing professional development, and how business, social, and personal contacts, and relationships of the interviewees contributed to their ongoing professional development. The findings showed the skills discussed in the literature were identified as being important for the interviewees given they work in highly technological and innovative environments and also supported the findings from the survey phase of this present study.

**Approaches to skill and professional development**

The survey findings showed that business, social and personal networked learning approaches were very important for their ongoing skill and professional development. It was found that survey respondents preferred to engage in some form of formal education and training (predominantly by completing short courses), as well as using different forms of
informal learning approaches, such as interacting with work colleagues, accessing various online technologies for just-in-time information and skills, and engaging with business and personal relationships, which primarily focused on developing their generic skills. It was surmised from this phase that the key skill requirements for industry professionals were business management, communications, technical ability, software knowledge, networking with others, creativity, project management, and keeping abreast of industry trends. The survey findings, while not claiming to be exhaustive, identified the value placed on approaches to online technologies and face-to-face discussions, which were considered important findings as there is little literature on how informal learning and social and business relationships contributed to the skill and professional development of individuals working in micro businesses in the digital content industry.

From the interview findings it was concluded that professionals largely preferred to employ social informal learning strategies by using some form of online technology, interacting with their business and social relationships in either a face-to-face or online mode or self-directed learning for their skill and professional development. It was concluded that a need existed for the frequent creation and updating of knowledge structures by these professionals, and that they should engage and develop their meta-cognitive capacity in order to select where and how to learn and be able to filter and synthesise information for credibility.

It was concluded that formal education and training plays an important role within the industry, as it was suggested by a number of interviewees that having a qualification was essential to work in the industry. However, it was also felt that universities were slow to react to the industry requirements in terms of their curriculum development, and the courses offered by these institutions did not match the job requirements. This should be considered a clarion call for higher education institutions in terms of better using technology to provide
learners access to informal communities, and learning that is structured in a hybrid manner to integrate core curriculum with 21st century skill requirements.

**Informal learning networks**

The interview phase of the study also described and documented the learning networks of the interviewees in a visual format of network diagrams. The purpose of documenting the learning networks was to better understand the function and role of informal learning networks for industry professionals. From the network diagrams, it was shown that the skills and professional development of those working in micro businesses would be best served by engaging in one or more forms of informal learning network: online networks and face-to-face communities of practice. It was concluded that these learning networks were particularly relevant for these professionals as they were able to interact with other industry professionals and work colleagues, they were able to maintain connections related to their professional interests, engage with their social relationships using some form of online technology, and communities of practice offered the professional a socially-based mode where they could also engage their social and personal relationships.

The documentation of the network diagrams also concluded that factors such as the number of relationships, the flow of information and the strength of ties (or intensity of relationship) play a significant role in the skill and professional development. In analysing the network diagrams it was concluded that high intensity relationships provided frequent and timely access to information, while low intensity relationships were found to be just as important as strong ties in terms of knowledge sharing, where they provided the learner access to new information by interacting with different individuals. This led to the conclusion that professionals must maintain a variety of high and low intensity relationships in order to better maximise their ability to share and/or source relevant information and knowledge as part of their professional development. The network diagrams also showed that that the size
and diversity of a person’s network impacted on their ability to be able to share and/or source information and knowledge that affected their ongoing professional currency. It was suggested that larger networks had a wider and more varied set of characteristics, such as the number of members, the information shared and the mechanisms of interaction, while smaller networks had a narrower focus of topics and involved a smaller number of interactions.

Finally, it was concluded that professionals who interacted in two-way information flow, particularly through some form of online technology, found this form of communication to be an excellent substitute for physical proximity as it allowed for rapid feedback between individuals, but also provided access to a variety of contacts, such as industry peers, and social relationships.

This thesis began with the premise that evidence was lacking for how individuals working in digital content micro businesses progressed their skill and professional development. The contention of this study was that these professionals needed to engage in some form of informal learning by engaging and interacting with their social and business relationships as a means of promoting their professional currency. Through the participants of this study, it has been shown that given the rapid advancement of ICTs, which are transforming the workplace and the learning environment, professionals working in micro businesses need to engage in, and indeed do engage in, some form of social and networked informal learning approach in order to maintain their professional currency.

**Recommendations**

Given the findings of this study, recommendations have been developed in three broad categories in order to better serve and to support the skill and professional development of industry professionals. The categories are: educational institutions, industry associations and industry professionals.
Educational institutions

In discussing the recommendations for educational institutions, the study’s findings clearly show not only the importance of formal education and training, but areas where higher education and vocational education and training institutions can offer more focused, tailored and effective learning for industry professionals.

Higher education

The new affordances of digital technology in the educational space mean that the time is right for reimagining the higher education sector and revisioning higher education curricula for digital content professionals. One such reimagining that draws heavily on the findings from this study is a hybrid model of university learning for the 21st century that takes into account the preferred learning approaches of the learner.

From an instructional design paradigm point of view, a key recommendation for higher education institutions is the need to complement both classroom and field training in such a way that it incorporates the attitudes, skills and knowledge of the learner with their personal learning preferences such that it enables the acquisition of the critical skills needed to work in the industry. This would best serve the ability of the higher education sector to offer more flexible and personalised learning on two levels: by engaging and partnering with industry-based communities and practitioners to help ensure relevance and authenticity of the learning experience, and changing to a learner-driven, on-demand and user-led model.

In relation to learning approaches and higher education institutions, this study uncovered two major findings that directly impact on the provision of a more focused and industry and learner driven learning. The key findings are: just-in-time and passive learning are preferred approaches taken by industry professionals as part of their ongoing development, and higher education qualifications for digital content professionals are very important. However, this study also discovered that university programs were not as relevant
as they could be in terms of industry and job relevance, and that university programs
generally do not teach, or use, learning approaches in the ways that digital content
professionals appear to want to learn. The opportunity here for higher education institutions,
then, is to look at reimagining their pedagogical models and ensuring their curricula is more
relevant to the industry. There are three approaches in which this could be achieved: (1)
Improved partnerships with industry whereby universities have more direct and current links
to industry; (2) making learning experiences more networked, social, learner-driven, and
based on authentic experiences; and (3) by reducing the degree to which academic staff
package or bundle course content in such a way that it becomes out of date immediately with
little review or link back to current industry requirements.

Vocational education and training institutions

There is a massive opportunity for vocational education and training institutions to
better serve the skill and development needs of industry professionals. The emergence of
online technology in education is a mode that could be integrated into a blended model of
delivering a professional short course solely focused on the skills required for working in the
digital content industry.

What is proposed is a professional short course that incorporates and blends the
connectivist and transformative learning approaches (Siemens, 2012) with a face-to-face
component that allows for authentic and collaborative learning experiences for industry
professionals such as illustrators, graphic designers, and studio based workers.

The proposed industry-focused short course would cover specific generic-type skills
such as business management, financial management, project management that would
typically be delivered in a reflective classroom setting. Industry-specific skills considered
vital by industry professionals in this study would also be offered by this professional short
course and would include skills such as innovation and creativity, entrepreneurship, technical

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and technological, and programming and software currency. Given the rapidly changing technological environment, currency and relevance to industry requirements would be maintained by engaging and consulting with a community and network of industry practitioners, and by utilising such online resources as forums and networking sites to access and source current just-in-time discipline-specific skills. These particular skills could be delivered by industry leaders and practitioners, regardless of where they are located, utilising various online technologies. This would offer the learner the requisite links to industry currency and skills supported by face-to-face classroom time and learning materials such as readings and focus questions. To better illustrate the detail of the proposed industry-related short course, Table 38 below provides more detail on the topics and the best way to learn and develop these particular skills based on the findings of this present study.

**Table 38: Proposed short course structure and learning approaches**

<table>
<thead>
<tr>
<th>Skill area</th>
<th>Topics</th>
<th>Learning and teaching approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and creativity</td>
<td>• Idea development</td>
<td>• Face-to-face in-class sessions with industry leaders and other professionals</td>
</tr>
<tr>
<td></td>
<td>• Creativity and innovation skills</td>
<td>• Experiential reflection</td>
</tr>
<tr>
<td></td>
<td>• Translating ideas into action</td>
<td>• Workplace-related project work</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>• Balancing creativity with commercial focus</td>
<td>• Face-to-face</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Experiential reflection</td>
</tr>
<tr>
<td>Technological</td>
<td>• Infrastructure and architecture</td>
<td>• Online networking, forums and news sites</td>
</tr>
<tr>
<td></td>
<td>• Internet and mobile platforms</td>
<td>• Blogs and wikis</td>
</tr>
<tr>
<td></td>
<td>• ios, iphone and Android development</td>
<td>• Workplace-related project work</td>
</tr>
<tr>
<td>Skill area</td>
<td>Topics</td>
<td>Learning and teaching approach</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>Software and programming</td>
<td>• C ++, C sharp, Java and ActionScript 3</td>
<td>• Online networking, forums and news sites</td>
</tr>
<tr>
<td></td>
<td>• Functional programming, Ruby Rails and Scala</td>
<td>• Blogs and wikis</td>
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<tr>
<td></td>
<td>• Visual Studio and Eclipse</td>
<td>• Workplace-related project work</td>
</tr>
<tr>
<td></td>
<td>• Adobe suite including Photoshop and Illustrator</td>
<td></td>
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<tr>
<td></td>
<td>• Mac programming</td>
<td></td>
</tr>
<tr>
<td>Business management</td>
<td>• Human resource management</td>
<td>• Face-to-face</td>
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<tr>
<td></td>
<td>• Business and leadership skills</td>
<td>• Experiential reflection</td>
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<tr>
<td></td>
<td>• Managing and leading teams</td>
<td>• Workplace-related project work</td>
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<tr>
<td></td>
<td>• Planning and organising</td>
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<tr>
<td>Communication skills</td>
<td>• Interactive communication</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Oral and written communication</td>
<td>• Experiential reflection</td>
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<tr>
<td></td>
<td>• Sharing information</td>
<td>• Workplace-related project work</td>
</tr>
<tr>
<td>Project management skills</td>
<td>Time, people, risk, and contract management</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Design planning</td>
<td>• Experiential reflection</td>
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<tr>
<td></td>
<td>• Design mechanics</td>
<td>• Workplace-related project work</td>
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<tr>
<td></td>
<td>• Visual, real-time and virtual effects</td>
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<td></td>
<td>• Portfolio development</td>
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<tr>
<td>Design skills</td>
<td>• Being responsive</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Diversification of services</td>
<td>• Workplace-related project work</td>
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<td></td>
<td>• Being flexible</td>
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<td></td>
<td>• Adapting to new and changed situations</td>
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<tr>
<td>Adaptability</td>
<td>• Communicating between and among different stakeholders</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Knowledge and concepts of the sciences, mathematics, social sciences,</td>
<td>• Workplace-related project work</td>
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<td></td>
<td>and humanities fields</td>
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<tr>
<td>Transdisciplinarity</td>
<td>• Developing practical solutions</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Solving problems in teams</td>
<td>• Workplace-related project work</td>
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<td></td>
<td>• Resolving customer issues</td>
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<td></td>
<td>• Testing and implementation</td>
<td>• Experiential reflection</td>
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<tr>
<td>Problem-solving and critical</td>
<td>• Online networking, forums and news sites</td>
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<tr>
<td>thinking</td>
<td>• Blogs and wikis</td>
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<td>• Workplace-related project work</td>
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<td>• Workplace-related project work</td>
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<td></td>
<td>• Experiential reflection</td>
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<tr>
<td>Skill area</td>
<td>Topics</td>
<td>Learning and teaching approach</td>
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<tr>
<td>Knowing how to learn</td>
<td>• Learning and thinking skills</td>
<td>• Face-to-face</td>
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<td></td>
<td>• Critical thinking</td>
<td>• Workplace-related project work</td>
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<td>• Reflective practice</td>
<td>• Experiential reflection</td>
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<td></td>
<td>• Contextual learning skills</td>
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<td>Interpretation and communication</td>
<td>• Reading and interpreting documents</td>
<td>• Face-to-face</td>
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<tr>
<td>capabilities</td>
<td>• Translating concept to reality</td>
<td>• Workplace-related project work</td>
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<td></td>
<td>• Collaboration skills</td>
<td>• Experiential reflection</td>
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</table>

In summation, the proposed short course highlights not only the key skill requirements identified by this study, but also those discussed by the various 21st century skills frameworks. It also incorporates the notions of just-in-time information and knowledge, and passive learning through online-mediated access, while providing currency and relevance through industry practitioners and leaders.

**Industry associations**

The findings, implications and interviewee comments from this study point to clear outcomes for industry and sector associations to better support the ongoing development of industry professionals.

From the interviews, it was identified that the Australian Interactive Media Industry Association (AIMIA) could be more active in other cities and be less “Sydney-centric” (I01). One interviewee noted the Queensland chapter of AIMIA is quite active in organising networking and industry events for industry professionals. Feedback from the participants suggests that AIMIA become more broadly-focused on all sectors of the industry and not just on the “technology guys” (I01). This could be achieved by having dedicated sector-specific sessions and events where guest speakers are industry-leaders in their field, which would provide a link to current sector-specific trends and challenges.
To further develop and promote the city and region-focused networks of professionals, it is also recommended that AIMIA look to organise and conduct specific networking and industry events that focus on city, region or state-related issues, which, according to Bessant & Tsekouras (2001), are important, as they promote learning clusters and networks within, and between, industry professionals and practitioners.

*Industry professionals*

Ultimately, the study’s findings and implications are aimed at developing better skilled industry professionals. To this end, it is recommended that industry professionals must engage in some form of ongoing development to ensure their currency within their sector of the industry. This study has shown this could be achieved through such approaches as use online networking sites, forums and news sites, blogs and wikis, and face-to-face discussions with other industry professionals. This could be enacted in a number of ways. Firstly, through one of AIMIA’s educational partners, such as the Australian Academy of Design, the Australian Centre for Moving Image, Flinders University, Griffith University, North Sydney Institute of TAFE, and Social Rabbit, that offer formal and informal education, training and professional development opportunities. By engaging with one of AIMIA’s educational partners, industry professionals would be able to develop not only their generic skills, such as critical-thinking, communication and business management skills and meta-cognitive skills, but also interact with communities of practitioners and other industry professionals.

It is also recommended that industry professionals engage, interact with and develop their network of contacts, which would typically include clients, other industry professionals, work colleagues, friends and relatives, and industry associations, to ensure they have access to immediate just-in-time information and knowledge, as well as keeping abreast of current and future industry trends. It is also recommended that interactions within their respective networks be enacted through a combination of online media, such as networking sites and
forums, supplemented with face-to-face discussions in a community of practice setting with like-minded professionals and practitioners. From this study, several conclusions and recommendations can be derived in relation to the approaches and patterns of learning and social networks, how they are enacted and what is learned within these networks. An effective learning and social network would comprise of work colleagues, other industry professionals, clients, industry associations, and friends and relatives. These networks would be best enacted through online networking sites, online forums, face-to-face discussions, and through communities of practice. An effective learning and social network would typically consist of at least nine high intensity relationships, but must also include and be supported by a number of low intensity relationships. Finally, these networks must be topic-related, where topics such as business management, industry and future trends, technology, software knowledge and programming, and job-specific skills would be sourced and/or shared.

**Limitations of the study**

This research study has limitations that must be acknowledged when interpreting the results as well as setting the boundaries of the study. The limitations of the study have been grouped into three categories: research design, research participants and research outcomes.

In terms of research design, a number of limitations exist. Firstly, it is recognised that in the online survey phase, the use of self-reporting and the online mode of the survey itself carried with it limitations in terms of potential bias and unwillingness to complete the survey. It is also recognised that the use of convenience and snowball sampling can introduce issues in terms of representativeness of the sample and therefore generalisability of these findings is not claimed by the survey findings. The design of the interview phase in attempting to use a maximum variation sample to obtain interviewees with a wide a range of experiences and characteristics is another limitation. In the end, eight people were able to be interviewed from a small cross-section of sectors from within the industry, which allowed a small amount of
comparison across the different sectors and roles within the industry. However, the validity and data collected from this number of interviews is supported by Guest, Bunce & Johnson (2006), who suggests that in conducting interviews, saturation of information would typically occur within the first twelve interviews, though the basic elements could be present in as early as six interviews. Finally, while it is recognised that this study cannot claim to be exhaustive and wholly representative of the population, the conduct of an additional data collection phase through case studies would have been able to further portray, situate and analyse informal learning networks in actual micro business and communities of practice settings, which the survey and interviews may not have been able to provide. The original research design called for three separate data collection phases, which included a case study phase, however this phase was not conducted due to time and resource constraints. The aim of the case study phase was to partially address research questions three and four (in conjunction with the interviews) and it would have added further weight to the triangulation of the data. This could be taken up as an approach for a future study in this area.

The conduct of the research and the participants themselves also represented a number of limitations. It is firstly acknowledged that, as with any research, the researcher brings biases and prior experience that may impact on the research outcomes. The researcher had some familiarity with project-based work and with some sectors within the industry and was able to relate to terminology and concepts that were discussed in the interviews. This brought benefits and drawbacks, as the researcher was able to establish a level of credibility with the interviewees. However, it also meant that the researcher had some pre-existing knowledge of the work environment.

Another limitation that is acknowledged is the recruitment approach in the survey phase and indeed in the number of completed survey responses. The survey phase consisted of two stages of recruitment in order to increase the number of completed surveys; the first
was through an industry association, the second was through online searches and direct email invitations to potential respondents. The second stage of recruitment was heavily based on snowball sampling, which asked potential respondents to communicate or recommend the survey to others. However, a key disadvantage to this form of sampling is the reliance and the goodwill of others in forwarding and/or recommending the survey to others in the industry. Despite the offer of a potential reward and an incentive to complete the survey, the online survey phase could be considered a success as a total of 184 completed surveys were received; however, the recruitment approach in itself provided some inherit problems. The potential participants could treat the email invitation to participate as just another email, or chose not participate after reading the background and the expected outcomes of the study, which was highlighted by the fact that there were 546 visits to the online survey page. Other factors that could have contributed to the low response rate include the design and length of the survey and the potential non-delivery of the email invitation. These particular issues were discussed by Hoonakker & Carayon (2009), who suggest that while an online survey offers greater access to a wider sample size, factors such commitment to complete the survey, possible lack of anonymity, survey design, and the ease of discarding the email are all contributing factors that influence online survey response rates. The other limitation from the survey phase that must be acknowledged is that the survey findings cannot be generalised across the entire population. Given an indicative population of 92,000 workers in micro businesses in the digital content industry in Australia (CIE, 2005), it was expected that a sample size, based on Krejcie & Morgan’s (1970) table, as cited by Sarantakos (2005), of approximately 380 completed surveys was needed in order to make conclusive claims from this phase of the study. However the findings were used to draw broader conclusions about the population.
**Future research**

This research study can be seen as a commencement of a better understanding of the role that informal learning networks play in the skill and professional development for workers not just in micro businesses but across other businesses in the digital content industry, and, as such, raises some additional questions that could best addressed by further research.

In the survey phase of the study, one issue that emerged was the role formal education and training played for the respondents in their professional development. It was shown that short courses (typically between two and ten days in length) went some way to filling an immediate skill development gap for the learner, as well as meeting the employer’s business outcomes. While the survey findings were not claimed to be exhaustive, the value and role that short courses play in a person’s ongoing skill development could be explored in further studies.

From the survey findings it was speculated that certain skill sets (such as business management, marketing, technological, software knowledge) lent themselves to being developed either through some form of formal education and training program or through a more informal learning approach (professional, business and personal relationships, attending conferences), or a combination of approaches (for instance accessing blogs and wikis, and completing a formal education and training program). These findings could be further investigated with a larger set of participants, or possibly through an industry-wide longitudinal study.

The interview phase of this study raised a number of additional questions in terms of what informal learning approaches best suited industry professionals: (1) the role of professionally-based networks: (2) the use and access to online technologies; (3) the true
nature of how communities practice operate across the industry; and (4) the role of project-based workplace learning in the industry.

The interviews showed that interacting with other industry professionals increased professional knowledge, but this was not the case for all interviewees, which suggested this may not be an industry-wide approach for all professionals. As such it was suggested that the skill and professional development requirements of participants may be impacted by their inability to engage with other industry professionals, and this could be further investigated in another study.

Online personal networks were quite prominent on both phases of the study. It was argued that professionals are moving to a just-in-time model in terms of seeking and developing the skills needed for their job, through various online technologies. In order to better understand the role and extent of online personal networks, further research would help address and explore issues such as how online networks and online technologies affect the immediacy of skill acquisition, and the extent to which online networking sites are widely used across the industry to support and aid in learning and skill development.

Some of the interviewees reached the conclusion that participating in communities of practice represented a socially-based approach to meaningful, relevant and authentic professional development. However, given the small sample size and an over-representation of some industry sectors a generalisation cannot be made. The role and function of communities of practice in the industry could be an area for future research with a larger number of interviewees from across all sectors of the industry.

Project-based learning by interacting with work colleagues through horizontal learning paths was identified by some interviewees as an effective workplace-based learning approach. It was argued that this was particularly relevant for the industry given the predominance of project-based businesses within the industry. It was suggested that this form
of learning network offered the learner the ability to integrate their learning with their work function, and, as such, were able to interact with their work colleagues using project-based learning. However, while it was argued that project-based learning was a valid informal learning approach, questions such as what makes project-based learning in the workplace relevant and conducive to learning could be further explored to better develop more effective ways to support and promote informal workplace learning.

The network diagrams showed professionals would typically have a range of networks in terms of their size, diversity, its members and the methods of interaction that directly related to their ability to source and/or share information and knowledge. While it was evident in some networks, it was not the case for all the interviewees, particularly the sole trader. This finding led to several issues that could not be generalised across the industry: (1) what approaches do sole traders undertake in their skill and professional development?; (2) whether larger networks have a more varied set of characteristics; (3) whether small networks have a narrower focus in terms of topics and forms of interaction. These issues and questions could be better addressed in further research studies.

Contribution to knowledge

The literature review in Chapter two outlined the existing models and theories relating to formal and informal learning; the generic, occupational and 21st century skill requirements for workers; and the broader area of socially-networked learning approaches. The literature provided a useful framework for framing and positioning the discussion as it affects and impacts the ongoing development of digital content professionals in micro businesses. This study has added to the theory by providing a more detailed explanation of how informal learning is enacted by micro business industry professionals, what these professionals need to learn, what skills and abilities they believe are important to work in the industry, and the role of formal education and training as an approach to ongoing professional development.
**Relationships and informal learning**

One of the key factors that emerged in the process of documenting the learning networks engaged with informal learning was business and social relationships. It emerged that industry professionals relied on a range of relationships, such as other industry professionals, work colleagues and personal contacts. The literature provided an important focus on the role of relationships and how social networks generally aid and facilitate the informal learning process. The work of a number of writers supports this view (such as Cross, Parker, Prusak, & Borgatti, 2001; Dawson, 2008; Lave & Wenger, 1991). These writers state that social networks provide an approach through which to understand elements such as interaction, relationships, the flow of information and knowledge between people, and this form of participation adds to the learning process. More importantly, they suggest that social networks provide an approach to better understand human interaction, relationships between individuals in a network, and the flow of information between individuals, groups, and businesses. Another key facet that emerged from the literature, and which was supported by the evidence from this study, was the importance and relevance of an individual’s relationships and ties. The literature was clear in that high intensity relationships, or strong ties, provided frequent and timely access to information, allowing for a regular exchange of information between individuals. Low intensity relationships, or weak ties, provide access to new information and to exposure to different ideas and viewpoints. This study and the literature reviewed highlighted the fact that the intensity of the relationship or strength of the tie also affected the information exchange and the nature of an individual’s connectedness with individuals within a network in such as way that the direction and flow of information and knowledge within a person’s network was affected.

Also impacting on, and supporting, the ability to engage with, and interact with, a person’s network of contacts was the utilisation of personal online networks. The literature
was very explicit in the role that online technologies played in the learning process (for example Dabbagh & Reo, 2011b; Rajagopal, Brinke, Van Bruggen, & Sloep, 2012; Siemens, 2005; Robertson, 2011). These writers argue that online learning is increasingly being used in education programs, as it encourages information sharing and supports collaborative and peer-to-peer learning. This was a key finding from this study, in as much that the personal online network is a particularly important approach to being able to access just-in-time information, and better support the ongoing skill development of industry professionals. The study found that by utilising various online technologies, such as online network sites, online forums and news sites, and blogs and wikis, afforded the professional access to timely information and knowledge, access to a range of information sources, and allowed the professional the ability to employ their preferred social informal learning approach.

**Skill requirements**

Two factors emerged as being central to the discussion of skill development: (1) occupational, generic, and 21st century skills development, and (2) the ability of the worker in learning to learn. Central to the discussion of skills was the need for professionals to be able to develop not only the traditional 20th century generic skills such as planning and organising, communication skills, and technical skills but also to develop what is termed 21st century skills, seen as being crucial for professionals to better handle the changing nature of their jobs in a 21st century knowledge society (Dede, 2010). Whilst 21st century and generic skills were seen as being important, this study clearly showed that in order to progress their industry currency, professionals needed to be able to integrate knowledge about their particular work-related tasks with mechanisms to develop their skills and capabilities that facilitated the learning to learn process. In fact, it is argued, learning how to learn is the core skill requirement in the 21st century and, as such, the challenge for workers and learners is to
find and develop mechanisms to develop skills, capacities and techniques that facilitate learning to learn in a continuous, incremental and efficient process (Cobo, 2013).

Another element of significance from this study which presents an opportunity to have more highly skilled individuals working in the digital content industry is in the area of formal education and training. This has already been suggested in a broad sense by a number of writers, in as much they contend that these workers need to be educated in 21st century capabilities, such as knowledge construction and synthesis, creativity, entrepreneurship, for jobs that demand a high level of information and technological ability, or even for jobs that may not exist yet (for example De la Fuente & Ciccone, 2002; Hearn & Bridgstock, 2010; Plomp, 2013). This study reinforced these points and argues that in order to meet the needs of a knowledge society universities must reinvent their processes, curricula and pedagogic practices, and embrace the sweeping influences of information and communication technologies (ICTs), which will deliver more responsive and flexible learning experiences for the future. To summarise the findings and highlight the contribution to knowledge of this study, Table 39 below compares the skill and professional development requirements for micro business industry professionals compared to the requirements of workers and learners in other industries.
### Table 39: Summary of skill requirement and approaches

<table>
<thead>
<tr>
<th>Skill and professional development requirements</th>
<th>Approaches</th>
</tr>
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<tbody>
<tr>
<td><strong>Micro business professionals</strong></td>
<td><strong>Workers in other industries</strong></td>
</tr>
<tr>
<td>- Innovation, creativity, and entrepreneurship</td>
<td>- Planning and organising</td>
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<tr>
<td>- Marketing skills</td>
<td>- Marketing skills</td>
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<tr>
<td>- Technical and technological</td>
<td>- Technical skills</td>
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<tr>
<td>- Programming</td>
<td>- ICT knowledge and skills</td>
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<tr>
<td>- Software currency</td>
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<tr>
<td>- Business management</td>
<td>- Business management</td>
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<tr>
<td>- Communication skills</td>
<td>- Communication skills</td>
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<tr>
<td>- Project management skills</td>
<td>- Project management skills</td>
</tr>
<tr>
<td>- Design skills</td>
<td>- People and human resource management</td>
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<tr>
<td>- Industry trends</td>
<td>- Financial skills</td>
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<td>- Adaptability</td>
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<td>- Transdisciplinarity</td>
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<tr>
<td>- Problem-solving and critical thinking</td>
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<tr>
<td>- Knowing how to learn</td>
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<td>- Interpretation and communication capabilities</td>
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</table>
The skills identified in Table 39 above shows a clear delineation and contrast between the most important skills for micro business industry professionals in comparison to what would be the typical skill requirements for professionals in other industry sectors. The skills listed for micro business professionals are arranged in terms generic skills, job-related skills, and meta-cognitive and 21st century skills sets. In terms of skill and professional development approaches, the list summarises the approaches identified in the course of this study; however, it could be surmised that these approaches are not limited only to micro business workers, but to all industry professionals.

Network mapping methodology

A key innovation and contribution to the fields of network mapping and social network analysis was the development and implementation of a hybrid network mapping tool for this study. The need to develop and implement this hybrid model was based on the need to address the two research questions aimed at documenting the role and function of the informal learning networks of the interviewees.

The literature reviewed in chapters two and three outlined a number of models, approaches and theories relating to social network analysis, and methods of documenting social networks. While providing an excellent set of approaches and considerations, there was not one approach or model that could be implemented to enable the documentation of informal learning networks in this present study. This study has added to the theory of social network mapping by providing a more comprehensive model for network mapping and through a valid approach to supporting interview research methodology. It could be argued that the network mapping approach undertaken in this study has added further detail to Conway & Steward’s (1998) model for network depiction, by incorporating the views of Haythornthwaite (2000) and Hogan et al (2007), by expanding and building on the various network mapping approaches. It is further suggested that this model of documenting social
and learning networks could be used by researchers, industry professionals, businesses and organisations, industry associations and educational institutions alike. This approach would best lend itself to the study and depiction of communities of practice, innovation networks, organisational communications and learning, mapping information and communication technologies, social and business network analysis, and qualitative research studies.

In the course of the literature review and developing the methodology for documenting the respective informal learning networks, several sources were accessed and reviewed that discussed approaches and models to documenting and visualising the interviewee’s learning networks. In developing the network mapping tool for this study, a combination of three key sources were utilised: Conway & Steward (1998) approach to network mapping, Haythornthwaite (2000) views of online personal networks, and the Hogan, Carrasco & Wellman (2007) model for documenting the names of individuals and/or groups within a network.

Conway & Steward (1998) argue that the value of the network graphic was in its ability to depict a variety of quantitative and qualitative data by implementing a range of visual variables, such as the number of relationships, the size of the network and the intensity of the relationship, while also advocating the need for a standard template to allow for the depiction of individuals and/or information in quadrants. Several suggestions from Conway & Steward (1998) were implemented in the course of documenting the learning networks of the interviewees: two network diagrams templates were developed and implemented in the form of quadrants, which then depicted the information and the types of relationships respectively; different symbols were used to show the people and the information that was exchanged within the network; a standard set of visual graphics were used to represent factors such as intensity of the relationship, direction of information flow, and the people or organisations in the network. In adopting this approach the study directly addressed the focus
of the two research questions, which were to identify the role and function of informal learning networks of the interviewees. In this study, two network mapping templates were used as it was felt it would best represent each of the respective learning networks in order to provide different perspectives from a relationship and information basis. The first network diagram template focused on the information shared within an individual’s network, and used symbols to show who they interacted with, and lines of varying thickness to depict the intensity of relationship. The second network mapping template focused on the relationship an individual had with people or groups within their network, and used symbols to show the information exchanged, as well as lines of varying thickness to denote the level of intensity and the method of interaction.

In order to be able to document the interviewee’s learning networks, one of the key features identified by the different writers in the area was the need to identify the individuals and/or groups within a person’s network. The approach utilised for this study was suggested by Hogan et al (2007), which they call ‘name generation’. In their model, Hogan et al (2007) suggest that the method of name generation can be approached through the process of free recall and was best suited to an interview environment where the person is asked to name people and/or groups that they have interacted with within a given time period. It was felt that this approach was particularly relevant as it aligned to the interview methodology adopted in the second phase of the study. It helped with data integrity, it reduced interviewee burden, and only required the use of paper and voice recorder to document the names.

Finally, in determining how to represent the intensity of the relationships or strength of a tie within the respective networks, a combination of two approaches was used with the thickness of the line between individuals and/or groups (Conway & Steward, 1998) to denote either a low, medium or high level of intensity (Conway & Steward, 1998; Haythornthwaite,
2000). This is of particular significance for this study as it provided a better granular classification of the intensity of the relationships within the respective networks.

**Study of micro business professionals in the digital content industry**

At the outset of this study it was argued that professionals working in micro businesses operating in the digital content industry needed to engage and interact with their socially-based informal learning networks in order to progress their professional currency. This study was undertaken for two key reasons: there was little evidence of the skill requirements for industry professionals; and lack of empirical research in Australia relating to how individuals working in the industry manage their ongoing skill and professional development.

This study can be considered unique for a number of reasons. Firstly the study has been able to identify a set of generic and meta-cognitive skills, both of which industry professionals should indeed possess, and aspire to further develop, in order for them to operate in the 21st century information society. In conducting this study, a fundamental finding identified by the research participants was the need for timely access to information and knowledge. This prompted a second important research finding: the use of and access to online resources, and face-to-face socially-mediated learning communities, where these professionals were able to engage and interact with other industry professionals, work colleagues and social contacts in order to obtain quick access to relevant information and knowledge required for their job. As Anderson (2008) suggests, given the rise of ICTs, society has moved from the industrial age to an information society and jobs now demand information and knowledge as a central element of work. Finally, while not claiming to be exhaustive in its nature, this study has been able to effectively map and document the learning networks of industry professionals, which required the development and implementation of a hybrid model for social network mapping. The network diagrams clearly
showed what information was shared and/or sourced and the types of relationships and resources industry professionals would typically access in order to promote their professional currency.

**Thesis Summary**

The digital content industry is transforming traditional industry structures, business models and ways of doing things. It has an estimated output worth of over $18 billion to Australia’s economy. It is also widely recognised that the rapid development of ICTs are continuously transforming the way we work, and indeed the way we learn. Beginning in the second half of the 20th century, ICTs have transformed many societies from industrial societies, in which manufacturing was a central focus, into knowledge and information societies, in which dealing effectively with data and information has become a central element of work (Anderson, 2008). Hence, in an industry impacted by constant change, informal learning, in particular for those working in micro businesses, is clearly both essential and ubiquitous.

This thesis highlights, above all else, the critical importance of social and networked learning. In this study the participants largely preferred to employ some form of online technology and to rely on social relationships, either online or face-to-face, to access knowledge. Online learning modes offered the learner a more social based informal learning approach through a more distributed learning network of professionals and personal contacts, and offered access to timely just-in-time information. Face-to-face learning strategies proceeded along the line of communities of practice, which involved repeated and extended periods of interactions, which was deemed central and valuable to professional currency.

This thesis also highlighted the role of short courses as an important approach to skills development as they meet an immediate skill need for both learner and employer. However, this study also highlighted the shortcomings of universities as preparation for working in the
digital content industry. As more and more of what needs to be learned is digital, or is dependent on digital technologies, and is changing constantly, there is a widening chasm between professional development requirements and traditional university course content. In terms of skill development and the information society, the notion of 21st century work and skills increasingly requires entry-level qualifications. To that end, this research has demonstrated the need for learners and education institutions to focus on 21st capabilities centred on learning to learn and digital competence.
References


Bachmann, D., Elfrink, J., & Vazzana, G. (1996). Tracking the progress of e-mail vs. snail-mail. *Marketing Research, 8*(2), 31-35.


Appendix 1 – Survey

Professional learning through social networks in the digital content industry micro business sector

Approval Number: 1100000102

Section 1 – Background Information

1. The digital content industry includes commercial art, film and video, photography, electronic games, recorded media, sound recording, information storage and retrieval sectors. To be eligible to participate in this survey you must be working in the digital content industry, as either a sole trader or in a small to medium enterprise, and a member of the Australian Interactive Media Industry Association (AIMIA).

Would you describe yourself as currently working in the digital content industry as either a sole trader or in a small to medium enterprise, and a member of AIMIA?

- Yes – please go to question 2
- No – please go to end of the survey

2. What is your current main occupation in the digital content industry?

Please select one of the answers below or add your own

- Animator
- Audio production/post-production
- Camera operator
- CEO/Owner/Manager
- Clerical/admin worker
- Director
- Digital printer
- Developer
- Designer
- Director
- Finance officer
- Illustrator
- ICT professional
- Knowledge manager
- Manager
- Marketing manager
- Network engineer
- Producer
- Programmer
- Software developer/engineer
- Supervisor/Team leader
- Technician
- Web developer
- Video production/post-production
- Other, please specify ………………………………………………………………………………………………………
3. Formal learning is usually based in a classroom, highly structured, typically based on a curriculum, and directed by either a teacher, or a trainer.

What formal education and training have you undertaken for your skill and professional development?

Please select one answer from each column below

<table>
<thead>
<tr>
<th>Course</th>
<th>Field of study</th>
<th>Creative Industries sector</th>
<th>Digital Content Industry field</th>
</tr>
</thead>
<tbody>
<tr>
<td>o None</td>
<td>o Creative Industries</td>
<td>o Not applicable</td>
<td>o Not applicable</td>
</tr>
<tr>
<td>o Certificate IV (TAFE/private college)</td>
<td>o Natural and Physical Sciences</td>
<td>o Advertising</td>
<td>o Film and TV pre and post-production</td>
</tr>
<tr>
<td>o Diploma/Advanced Diploma (TAFE/private college)</td>
<td>o Information and Communications Technology</td>
<td>o Arts, crafts, and design</td>
<td>o Content development and publishing</td>
</tr>
<tr>
<td>o Undergraduate degree/Bachelor degree</td>
<td>o Engineering and related Technologies</td>
<td>o Architecture</td>
<td>o Content management</td>
</tr>
<tr>
<td>o Postgraduate Certificate/Diploma</td>
<td>o Architecture, Environmental, and related Studies</td>
<td>o Fashion</td>
<td>o Online and interactive games</td>
</tr>
<tr>
<td>o Masters degree</td>
<td>o Health</td>
<td>o Film, TV, Radio</td>
<td>o Internet-based marketing and advertising</td>
</tr>
<tr>
<td>o PhD</td>
<td>o Education</td>
<td>o Music, and Performing Arts</td>
<td>o Digital publishing and distribution</td>
</tr>
<tr>
<td></td>
<td>o Society and Culture</td>
<td>o Publishing</td>
<td>o Online education development</td>
</tr>
<tr>
<td></td>
<td>o Management and Commerce</td>
<td>o Software and Interactive Content</td>
<td>o Software manipulation</td>
</tr>
<tr>
<td></td>
<td>o Food, Hospitality and Personal Services</td>
<td>o Toys, games, and video games</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Overall, approximately how many years have you worked in the digital content industry?

Please select one of the answers below

- o Less than 12 months
- o 1 - 5 years
- o 6 – 10 years
- o 11 – 15 years
- o 16 - 20 years
- o 20 + years
5. What has been your career path to date within the digital content industry?

*Please select one answer for each column below*

<table>
<thead>
<tr>
<th>Occupation</th>
<th>How long are/were you employed in this position?</th>
<th>What is/was the primary purpose of the business?</th>
<th>How people are/were employed at the business?</th>
<th>On what basis are/were you employed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please complete one line for each position you have held in the industry</td>
<td>o Less than 12 months</td>
<td>o Advertising</td>
<td>o Sole trader</td>
<td>o Self-employed</td>
</tr>
<tr>
<td></td>
<td>o 1 – 2 years</td>
<td>o Communications or marketing</td>
<td>o 5 or less</td>
<td>o Freelance</td>
</tr>
<tr>
<td></td>
<td>o 2 – 3 years</td>
<td>o Design services</td>
<td>o 6 – 25</td>
<td>o Project work</td>
</tr>
<tr>
<td></td>
<td>o 3 – 4 years</td>
<td>o Video post/pre-production</td>
<td>o 26 – 50</td>
<td>o Full-time</td>
</tr>
<tr>
<td></td>
<td>o 4 – 5 years</td>
<td>o Distribution services</td>
<td>o 51 – 100</td>
<td>o Part-time</td>
</tr>
<tr>
<td></td>
<td>o 6 – 10 years</td>
<td>o e-Commerce</td>
<td>o More than 200</td>
<td>o Casual</td>
</tr>
<tr>
<td></td>
<td>o 11 – 15 years</td>
<td>o Audio pre/post-production</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o 16-20 years</td>
<td>o Web hosting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o 20 + years</td>
<td>o Technical services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Special effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Animation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Have you worked in a digital content type role in any other sectors or industries (e.g. - designing educational games for the health sector, software manipulation for a mining company, content development for a management firm)?

*Please select one of the answers below*

- o Yes – please go to question 7
- o No – please go to question 8
7. Please specify the digital content role and the other sectors or industries where you have worked.

Please write each position you have held in chronological order, and complete as many lines as needed

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please complete one line for each position you have held</td>
<td>o Agriculture</td>
</tr>
<tr>
<td>o Building and construction</td>
<td></td>
</tr>
<tr>
<td>o Education</td>
<td></td>
</tr>
<tr>
<td>o Environmental services</td>
<td></td>
</tr>
<tr>
<td>o Finance</td>
<td></td>
</tr>
<tr>
<td>o Food and Hospitality</td>
<td></td>
</tr>
<tr>
<td>o Health</td>
<td></td>
</tr>
<tr>
<td>o Information and Communications Technology (ICT)</td>
<td></td>
</tr>
<tr>
<td>o Management</td>
<td></td>
</tr>
<tr>
<td>o Oil, Mining, and Gas</td>
<td></td>
</tr>
<tr>
<td>o Science</td>
<td></td>
</tr>
<tr>
<td>o Society and Culture</td>
<td></td>
</tr>
<tr>
<td>o Tourism</td>
<td></td>
</tr>
<tr>
<td>o Other</td>
<td></td>
</tr>
</tbody>
</table>

8. Have you worked in any non-digital content roles in other sectors or industries? (e.g. - call centre operator, manager in an IT firm, electrician, teacher at TAFE)?

Please select one of the answers below.

o Yes – please go to question 9
o No – please go to question 10
9. Please specify the non-digital content roles and sectors/industries in which you have worked.

Please write each position you have held in chronological order, and complete as many lines as needed.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Sector</th>
</tr>
</thead>
</table>
| Please complete one line for each position you have held | o Agriculture  
o Building and construction  
o Education  
o Environmental services  
o Finance  
o Food and Hospitality  
o Health  
o Information and Communications Technology (ICT)  
o Management  
o Oil, Mining, and Gas  
o Science  
o Society and Culture  
o Tourism  
o Other |

10. Apart from AIMIA are you a member of any other industry association or professional body?

Please select one or more from the list below

- o No – please go to Question 11
- o Games Developers Association of Australia (GDAA)
- o Screen Producers Association of Australia (SPAA)
- o Australian Graphic Design Association (ADGA)
- o Australian Screen Directors Association (ASDA)
- o Australian Subscription Television and Radio Association
- o Australian Writers Guild
- o Australian Interactive Entertainment Association (AIEA)
- o Australian Direct Marketing Association (ADMA)
- o Australian Information Industry Association (AIIA)
- o Commercial Radio Australia
- o Australian Mobile Telecommunications Association
- o Free TV Australia
- o Australian Computer Society
- o Australian Telecommunications Users Group (ATUG)
- o Internet Industry Association
- o Media, Entertainment and Arts Alliance
- o Australian Screen Council
- o National ICT Industry Alliance
- o Australian Services Roundtable

Other, please specify ............................................................................................................
11. What is your age?

*Please select one of the answers below*

- Under 20
- 20 - 29
- 30 – 39
- 40 – 49
- 50 - 59
- 60 +

12. What is your gender?

*Please select one of the answers below*

- Male
- Female

Section 2 – Learning, Education, Skill and Professional development

13. Skill and professional development is the ongoing development of an individual’s technical, non-technical, and professional skills. (e.g. - using Adobe Photoshop, development of communication skills, better prioritisation skills, building workplace relationships)

Please list what you think are the 5 most important skill and professional development learning needs for people working in the digital content industry.

*Please use the blank space below to list your answers*

1. ........................................................................................................................................

2. ........................................................................................................................................

3. ........................................................................................................................................

4. ........................................................................................................................................

5. ........................................................................................................................................
14. What are your most important skill and professional development learning needs at the moment?

*Please use the blank space below to list your answers*

1. ........................................................................................................................................

2. ........................................................................................................................................

3. ........................................................................................................................................

4. ........................................................................................................................................

5. ........................................................................................................................................

15. What do you think will be your 5 most important future skill and professional development learning needs in the next 3 to 5 years?

*Please use the blank space below to list your answers*

1. ........................................................................................................................................

2. ........................................................................................................................................

3. ........................................................................................................................................

4. ........................................................................................................................................

5. ........................................................................................................................................
16. **What formal** work-related education and training have you undertaken in the past 12 months?

*Please select one or more from the lists below*

<table>
<thead>
<tr>
<th>Type of education</th>
<th>How was it funded?</th>
<th>What is/was the duration?</th>
<th>In what field was the education and training?</th>
<th>What skills did it address?</th>
</tr>
</thead>
<tbody>
<tr>
<td>o None</td>
<td>o Self-funded</td>
<td>o 1 day</td>
<td>o Administration</td>
<td><em>Please write your responses here</em></td>
</tr>
<tr>
<td>o Short course</td>
<td>o Employer funded</td>
<td>o 2 - 10 days</td>
<td>o Advertising</td>
<td></td>
</tr>
<tr>
<td>o Specialised</td>
<td>o Government funded</td>
<td>o One term</td>
<td>o Agriculture</td>
<td></td>
</tr>
<tr>
<td>o product/vendor</td>
<td>o Other</td>
<td>o One semester</td>
<td>o Building and construction</td>
<td></td>
</tr>
<tr>
<td>o course</td>
<td></td>
<td>o 1 year</td>
<td>o Content development</td>
<td></td>
</tr>
<tr>
<td>o Special event</td>
<td></td>
<td>o 2 years</td>
<td>o Content management</td>
<td></td>
</tr>
<tr>
<td>o Organised</td>
<td></td>
<td>o 3+ years</td>
<td>o Digital publishing</td>
<td></td>
</tr>
<tr>
<td>o learning</td>
<td></td>
<td></td>
<td>o Design</td>
<td></td>
</tr>
<tr>
<td>o support</td>
<td></td>
<td></td>
<td>o Education</td>
<td></td>
</tr>
<tr>
<td>o TAFE/private</td>
<td></td>
<td></td>
<td>o Film</td>
<td></td>
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<tr>
<td>o college</td>
<td></td>
<td></td>
<td>o Finance</td>
<td></td>
</tr>
<tr>
<td>o University</td>
<td></td>
<td></td>
<td>o Food and Hospitality</td>
<td></td>
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<tr>
<td>o Other</td>
<td></td>
<td></td>
<td>o Health</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>o Human Resource Management</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>o Information and Communication technology</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>o Knowledge management</td>
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<td></td>
<td>o Management</td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>o Marketing</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>o Music</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Network engineering/management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Online games</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Performing arts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Publishing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Society and culture</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Software management/management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Tourism</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Visual arts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Web development</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Web management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o Other</td>
<td></td>
</tr>
</tbody>
</table>
17. Informal learning is semi-structured and can occur in a variety of places, such as learning at work, shared information among members of a group, being part of a community of practice, and self-directed learning programs.

How important are these informal learning strategies for your skill and professional development?

*Please complete the answers below by selecting one answer for each strategy*

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Not important</th>
<th>Somewhat important</th>
<th>Neutral</th>
<th>Important</th>
<th>Very important</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessing books, manuals etc</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Accessing blogs, wikis, groups, and forums</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Accessing online networking sites (e.g. – facebook, Twitter)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Consulting colleagues within your business</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Consulting with work contacts outside your business</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Consulting with non-work contacts (e.g. - friends, relatives, etc)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Accessing professional journals and magazines</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Attending industry shows and conferences</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
18. Other than the informal learning strategies listed in the previous question, what informal learning strategies do you use?

............................................................................................................................

............................................................................................................................

............................................................................................................................

19. Thinking about the past 7 days, how often have you interacted with your work colleagues regarding your own skill and professional development?

You must provide an answer for each type of interaction listed.

<table>
<thead>
<tr>
<th>Types of interactions</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>None</td>
</tr>
<tr>
<td>email</td>
<td>1</td>
</tr>
<tr>
<td>SMS/Text</td>
<td>2</td>
</tr>
<tr>
<td>Online blogs, wikis, groups, and forums</td>
<td>3</td>
</tr>
<tr>
<td>Online networking sites (such as facebook, Twitter)</td>
<td>4</td>
</tr>
<tr>
<td>Casual face-to-face discussion</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6 - 10</td>
</tr>
<tr>
<td></td>
<td>11 – 20</td>
</tr>
<tr>
<td></td>
<td>21 - 50</td>
</tr>
<tr>
<td></td>
<td>51 – 100</td>
</tr>
<tr>
<td></td>
<td>More than 100</td>
</tr>
</tbody>
</table>

20. In the past 7 days, what topics have you discussed with your work colleagues regarding your own skill and professional development?

............................................................................................................................

............................................................................................................................

............................................................................................................................
21. Thinking about the past 7 days, how often have you interacted with contacts outside your business regarding your own skill and professional development?

*Please complete one line for each type of interaction listed below*

<table>
<thead>
<tr>
<th>Types of interactions</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>None</td>
</tr>
<tr>
<td>email</td>
<td>1</td>
</tr>
<tr>
<td>SMS/Text</td>
<td>2</td>
</tr>
<tr>
<td>Online blogs, wikis, groups, and forums</td>
<td>3</td>
</tr>
<tr>
<td>Online networking sites (such as facebook, Twitter)</td>
<td>4</td>
</tr>
<tr>
<td>Casual face-to-face discussion</td>
<td>5</td>
</tr>
<tr>
<td>6 - 10</td>
<td></td>
</tr>
<tr>
<td>11 – 20</td>
<td></td>
</tr>
<tr>
<td>21 - 50</td>
<td></td>
</tr>
<tr>
<td>51 – 100</td>
<td></td>
</tr>
<tr>
<td>More than 100</td>
<td></td>
</tr>
</tbody>
</table>

22. In the past 7 days, what topics have you discussed with your contacts outside your business regarding your own skill and professional development?

...................................................................................................................

...................................................................................................................

...................................................................................................................

...................................................................................................................

23. How often have you interacted with contacts outside your business regarding skill and professional development?

*Please complete one line for each type of interaction listed below*

<table>
<thead>
<tr>
<th>Types of interactions</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>None</td>
</tr>
<tr>
<td>email</td>
<td>1</td>
</tr>
<tr>
<td>SMS/Text</td>
<td>2</td>
</tr>
<tr>
<td>Online blogs, wikis, groups, and forums</td>
<td>3</td>
</tr>
<tr>
<td>Online networking sites (such as facebook, Twitter)</td>
<td>4</td>
</tr>
<tr>
<td>Casual face-to-face discussion</td>
<td>5</td>
</tr>
<tr>
<td>6 - 10</td>
<td></td>
</tr>
<tr>
<td>11 – 20</td>
<td></td>
</tr>
<tr>
<td>21 - 50</td>
<td></td>
</tr>
<tr>
<td>51 – 100</td>
<td></td>
</tr>
<tr>
<td>More than 100</td>
<td></td>
</tr>
</tbody>
</table>
24. In the past 7 days, what topics have you discussed with your contacts outside your business regarding your own skill and professional development?

..........................................................................................................
..........................................................................................................
.........................................................................................................

You have completed the survey questions. Thank you for your participation, we recognise your valuable contribution.

The next two questions are optional. Your email address will not be recorded as part of the survey results.

25. If you would like to receive a copy of the survey findings, please provide your email address here.

............................................................................................................................

26. If you would like to enter the draw for one of five $50 JB Hi-Fi gift cards, please provide your email address here.

............................................................................................................................

You are not eligible thank you note.

You have indicated that you are not currently working in the digital content industry as either a sole trader or in a small to medium enterprise, and not a member of AIMIA and as such you are not eligible to participate in this survey.

We wish to thank you for your time and the interest you have shown in this survey. You can now close this page to exit the survey.
Appendix 2 – Online survey participant information sheet

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT

 Approval Number: 1100000102

Professional learning through social networks in the digital content industry micro business sector

RESEARCH TEAM CONTACT DETAILS

Joe Campana (Researcher)
PhD candidate
Creative Industries Faculty, QUT
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joe.campana@student.qut.edu.au

Dr Ruth Bridgstock (Supervisor)
Vice Chancellor’s Research Fellow
ARC Centre of Excellence
Creative Industries Faculty, QUT
p: 07-3138 8587
r.bridgstock@qut.edu.au

DESCRIPTION

This survey is being undertaken as part of a post-graduate program for a Doctor of Philosophy through the Queensland University of Technology (QUT). This study is important as evidence and descriptions of how individuals manage their skill and professional development is lacking within the digital content industry.

The study will aim to identify and evaluate the skills required for employment in the industry, as well as investigate how informal learning networks operate, what role they play for individuals in the digital content industry, and what approaches individuals take in their skill and professional development. This study is not attempting to establish definitive answers to the role that informal learning networks play in skill and professional development for individuals in the digital content industry, but to raise findings for distribution and sharing across the industry.

PARTICIPATION

The focus of this survey is for all workers within the digital content industry. To be eligible to participate in this survey, you must be working as either a sole trader, be employed in a small to medium enterprise, be listed on AIMIA’s current member database, and hold any position within the industry.

Your participation in this part of the study is voluntary. If you do agree, you can withdraw at any time prior to the completion of the survey without comment or penalty. Your decision to participate will in no way impact upon any current or future relationship with QUT (for example your grades).

A key part of the study is to survey workers in the industry to identify the skill set and approaches to learning and professional development of workers in the industry. As a worker in the industry, we invite you to participate in the survey. Your participation will involve completing an online survey. The survey should take you no longer than 15 minutes to complete. Your participation is voluntary and all responses are confidential and anonymous, and information obtained from the survey will be presented so that individual participants cannot be identified.
In recognition of your time commitment and contribution, should you choose to participate, the research team is providing participants the opportunity to enter a draw for one of five $50 gift cards from JB Hi-Fi. We recognise your valuable contribution and wish to thank you for your assistance.

EXPECTED BENEFITS

Your input will help to address the lack of dedicated research on skills and how professional development is undertaken in the industry, and provide a better understanding and build a picture of how individuals working in small businesses or operating as a sole trader in the digital content industry operate and access informal learning networks for their skill and professional development. It is also expected that the study may benefit future workers in the digital content industry in the development and planning of their career path within the digital content industry.

RISKS

There are no risks beyond normal day-to-day living associated with your participation in this project. However, the researcher has identified a number of possible technical risks related to the online environment which could have some implications for the participants. These risks include the conduct of the online survey, spamming, phishing, and email address management. The following arrangements will be put in place to manage the identified risks:

- All individual and business contact details, and email addresses will be managed by AIMIA, therefore the researcher, and the research supervisor will not have access to any participant contact information;
- The online survey will be managed and stored securely on QUT's secure on-campus network infrastructure, which will eliminate the possibility of phishing or spamming of individuals who complete the online survey;
- Individual email addresses will only be asked for as an opt-in option at the end of the survey from those participants who choose to enter the gift card draw and to receive a copy of the survey findings, and will not be attached to the survey; and
- The researcher, the research supervisor, and IT administrators will not be able access or utilise any email addresses entered by participants.

CONFIDENTIALITY

The names of individual participants or their employers are not required and will not be collected at any time during this research study, and all comments and responses will be treated confidentially and anonymously. All findings will be presented in aggregate form so that no individual participant is identifiable. Non-identifiable data collected in this project may be used as comparative data in future projects by the current researchers. Information provided in this survey is stored on QUT's on-campus infrastructure. Data collected and stored securely by the researcher is only accessible by the researcher, the research supervisor, and IT administrators. IT administrators are bound by the University's policies and procedures regarding the protection, privacy and confidentiality of data. All research activity is undertaken in accordance with QUT's policy on the conduct of research involving human participation which can be downloaded or viewed at [http://www.mopp.qut.edu.au/D/D_06_01.jsp](http://www.mopp.qut.edu.au/D/D_06_01.jsp)
CONSENT TO PARTICIPATE

For this phase of the study, the completion of the survey is accepted as an indication of your consent to participate. If you do agree to participate, you can withdraw from participation at any time prior to completing the online survey without comment or penalty. It should be noted that you cannot withdraw after you have submitted the online survey.

QUESTIONS / FURTHER INFORMATION ABOUT THE STUDY

If you have any general questions or require more information about the study, please contact the researcher, Joe Campana via email at joe.campana@student.qut.edu.au or on 07-3138 3890, or the research supervisor, Dr Ruth Bridgstock via email at r.bridgstock@qut.edu.au or on 07-3138 8587.

CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE STUDY

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit via email at ethicscontact@qut.edu.au or on 07-3138 5123. The QUT Research Ethics Unit is not connected with the research study and can facilitate a resolution to your concern in an impartial manner.

Thank you for helping with this research project. Please keep this sheet for your information.
Appendix 3 – Initial online survey recruitment email

Dear AIMIA member,

A survey is being undertaken by Joe Campana as part of a Doctor of Philosophy program at the Queensland University of Technology (QUT). If you would like participate in this study he is looking for people working in any position in the digital content industry in either small to medium enterprises, or operating as a sole trader, and is a member of the Australian Interactive Media Industry Association (AIMIA) to complete a 15 minute online survey. Your participation in the survey is voluntary.

This study is important as evidence and descriptions of how individuals manage their skill and professional development is lacking within the digital content industry. The study will aim to identify and evaluate the skills required for employment in the industry, and what approaches individuals take in their skill and professional development.

More details on the study and the online survey can be found at http://survey.qut.edu.au/survey/171189/9b37/. The survey will be accessible until 5pm on 11 April 2011. Should you choose to participate, the research team is providing you the opportunity to enter a draw for one of five $50 gift cards from JB Hi-Fi.

Many thanks for your consideration of this request, and we look forward to your participation.

Regards

Joe Campana (MEd, GDipTertEd, GCertTertEd)
PhD candidate (QUT, Brisbane)
p: 07-3138 3890 | m: 0400 506635
Appendix 4 – Sample of sector targeted online survey recruitment email

Calling all mobile app, web designers, and developers – Make yourselves heard!

My name is Joe Campana. I am a PhD student at the Queensland University of Technology (QUT) and am hoping to enlist your help to take part in and help raise awareness of my professional learning survey of the app, developers, design, and IT professional sectors within the wider digital industry.

I am looking for anyone working as an IT professional, software developer, designer, app developer, or programmer in either a small to medium enterprise, or operating as a sole trader to complete a 15 minute online survey regarding professional development. The results of this study will help inform the skill and professional development in the digital industry, and help build a more sustainable digital content workforce.

Participation in the survey is voluntary, and the survey can be found at http://survey.qut.edu.au/survey/171189/9b37/ and will be accessible until 5pm on 6 May 2011. For those who choose to participate, the research team is providing the opportunity to enter a draw for one of five $50 gift cards from JB Hi-Fi.

I would also greatly appreciate it if you could communicate the survey information and link via email, or via a 'tweet' to peers, colleagues, other businesses, and other professionals, or post it on an online group page, or on a professional facebook page.

Many thanks for your assistance and consideration of this request.

Regards

Joe Campana (MEd, GDipTertEd, GCertTertEd)
PhD candidate (QUT, Brisbane)
p: 07-3138 3890 | m: 0400 506635
Appendix 5 – Interview questions

Question 1 – Can you please tell me more about (name of the business)?

Question 2 – What does your role at (name of the business) involve?

Question 3 – Thinking about your role as a (role of the interviewee), what do you think are key skill and professional development requirements related to your job?

Question 4 – In your opinion, what do you think are the key skill and professional development requirements for people working in this sector?

Question 5 – In the past month what approaches have you undertaken to maintain and develop your professional currency as it relates to your job and your industry sector? (Prompt – this could be face-to-face discussions, SMS, online forums/networking/wikis, phone discussions)

Question 6 – Why did you choose (each approach from the previous question – if any)?

Question 7 – In what way have these contacts and/or relationships aided or met your learning requirements?

Question 8 – The following questions will be about mapping in a diagrammatical format your business, professional, and social networks and/or relationships as it relates to learning and development (Prompt: this could work colleagues, former work colleagues, clients, competitors, contacts in other industries, through online sites and forums, friends/relatives, associations)

Question 8a – Thinking about the past month, who have you assisted and/or supported you in terms of skill and professional development?

Question 8b – What topics or information do you discuss/have discussed with (for each person mentioned in question 8a)?

Question 8c – What method/s of communication/interaction did you /have you used to interact with (for each person mentioned in question 8a)? (Prompt – this could be face-to-face meetings, SMS, online forums/networking/wikis, phone discussions)

Question 8d – How would you describe the direction of flow of the information with (for each person mentioned in question 8a)?
Question 8e – How often do you / have you interacted with (for each person mentioned in question 8a)? *(Prompt – daily, weekly, monthly, etc)*

Question 9 – In your opinion, what is the importance of your social relationships/networks?

Question 10 – How do your social relationships/networks help meet your learning requirements?

Question 11 – How have online technologies aided your social interaction/s?

Question 12 – Earlier (in question 5) you mentioned some approaches and interactions with respect to your learning:

Question 12a – Which of these approaches hasn’t or doesn’t work for you?

Question 12b – Why? *(Prompt – for each approach identified in the previous question)*

Question 13 – What would you like to see happen to better support industry professionals in their ongoing skill and professional development?

Question 14 – Is there any else you would like to add?
Appendix 6 – Interviewee recruitment email

Dear (Name of business manager/owner)

My name is Joe Campana from the Queensland University of Technology (QUT) and I am doing a study looking at learning and professional development of workers in the digital media industry. I am looking for businesses in the Brisbane area, with people working in any position in either a micro business (businesses with up to 5 people), or operating as a sole trader, to take part in a face-to-face interview. Your participation in the interview is voluntary. In recognition your time commitment and contribution to consenting to be interviewed, the research team through the generous support of AIMIA is providing the opportunity for interviewee's to enter a draw for one of 2 places in one of AIMIA's Project Management courses.

This study is important as evidence and descriptions of how individuals manage their skill and professional development is lacking within the industry. The results of this study will better inform the approaches taken with respect to professional development, and help build a more sustainable digital media workforce.

More details on the study is provided in the attached Information Sheet. If you agree to participate please respond to this email to accept this request and I will be in contact with you to arrange a time and date for the interview/s. Could I also ask you to please send this email request onto any other employees within your business who may be interested in participating. Finally, at the time of the interview the researcher will ask you to sign a consent form to confirm your agreement to participate.

Many thanks for your consideration of this request, and we look forward to your participation.

Regards

Joe Campana (MEd, GDipTertEd, GCertTertEd)
PhD candidate (QUT, Brisbane)
p: 07-3138 3890 | m: 0400 506635
Appendix 7 – Interviewee participant information sheet

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT

Professional learning through social networks in digital content industry micro businesses
QUT Ethics Approval Number - 1200000121

RESEARCH TEAM CONTACT DETAILS

Joe Campana (Researcher)
PhD candidate
Creative Industries Faculty, QUT
p: 07-3138 3890 | m: 0400 506635
joe.campana@student.qut.edu.au

Dr Ruth Bridgstock (Supervisor)
Vice Chancellor’s Research Fellow
ARC Centre of Excellence
Creative, Design, and Performance Faculty, QUT
p: 07-3138 8587
r.bridgstock@qut.edu.au

DESCRIPTION

The interviews are being undertaken as part of a research study as part of a post-graduate program for a Doctor of Philosophy through the Queensland University of Technology (QUT). This study is important as evidence and descriptions of how individuals manage their skill and professional development is lacking within the digital content industry.

The study will aim to identify and evaluate the skills required for employment in the industry, as well as investigate how informal learning networks operate, what role they play for individuals in the digital content industry, and what approaches individuals take in their skill and professional development. This study is not attempting to establish definitive answers to the role that informal learning networks play in skill and professional development for individuals in the digital content industry, but to raise findings for distribution and sharing across the industry.

PARTICIPATION

Your participation is voluntary and all responses are confidential and anonymous, and information obtained from the interview will be presented so that individual participants cannot be identified. If you do agree, you can withdraw at any time prior to the completion of the survey without comment or penalty. If you withdraw, on request any identifiable information already obtained from you will be destroyed. Your decision to participate will in no way impact upon any current or future relationship with QUT (for example your grades).

A key part of the study is to interview professionals in the industry within a business case study setting to identify the skill sets, approaches to learning and professional development, and identify the role of informal learning networks, provide a way to collect data to further develop the understanding of their informal learning approaches, and learning networks, and gather opinions from individuals working in the industry. As a worker in the industry, we invite you to participate in the interviews. Your participation will involve an audio recorded interview at your work location or another agreed location. The interview will take approximately 45 minutes of your time to complete. Some indicative questions include:

- Can you please tell me more about the business?
• In your opinion, what do you think are the key skill and professional development learning needs for people working in this sector/field?
• What approaches have you undertaken to maintain and develop your professional currency as it relates to your job and the sector/field?
• In what way have social relationships aided your professional development?
• How have online technologies aided your social interactions?

Finally, in recognition of your time commitment and contribution to consenting to be interviewed, the research team through the generous support of AIMIA is providing the opportunity for interviewee's to enter a draw for one of two places in a Project Management course offered by AIMIA.

EXPECTED BENEFITS

Your input will help to address the lack of dedicated research on skills and how professional development is undertaken in the industry, and provide a better understanding and build a picture of how individuals working in small businesses or operating as a sole trader in the digital content industry operate and access informal learning networks for their skill and professional development. It is also expected that the study may benefit future workers in the digital content industry in the development and planning of their career path within the digital content industry.

RISKS

There are no risks beyond normal day-to-day living associated with your participation in this project. However, the researcher has identified a number of possible technical risks related to the online environment which could have some implications for the participants. These risks include the conduct of the online survey, spamming, phishing, and email address management. The following arrangements will be put in place to manage the identified risks:

• Permission to take notes, and record the interview will be sought prior to the commencement of the interview;
• The interview audio files, data, and transcripts will be managed and stored on QUT's secure on-campus IT network infrastructure which will eliminate possibility of any unauthorised access to the information; and
• No email addresses will be stored or recorded at any time in the conduct of this study; and
• A transcriber has signed a Confidentiality Agreement prior the transcription of any interview audio files.

PRIVACY AND CONFIDENTIALITY

The names of individual participants are not required and will not be collected at any time during this research study, and all comments and responses will be treated confidentially and anonymously.

As this phase of the study involves audio recording the following arrangements have been put in place to ensure the proper management of the information:

• you will have the opportunity to verify your comments and responses prior to final inclusion;
• the audio recordings will not be used for any other purpose (e.g. as an instructional aide); and
• the audio recordings will only be accessible by the researcher and the interview transcriber. It should be noted the Transcriber has signed a Confidentiality Agreement prior the transcription of any interview audio files taking place.

All findings will be presented in aggregate form so that no individual participant is identifiable. Information provided in this survey is stored on QUTs on-campus infrastructure. Data collected and stored securely by the researcher is only accessible by the researcher, the research supervisor, and IT administrators. IT administrators are bound by the University's policies and procedures regarding the protection, privacy and confidentiality of data. All research activity is undertaken in accordance with QUTs policy on the conduct of research involving human participation which can be downloaded or viewed at http://www.mopp.qut.edu.au/D/D_06_01.jsp

CONSENT TO PARTICIPATE

If you agree to participate by responding to the attached email, we would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participant.

QUESTIONS / FURTHER INFORMATION ABOUT THE STUDY

If you have any general questions or require more information about the study, please contact the researcher, Joe Campana via email at joe.campana@student.qut.edu.au or on 07-3138 3890, or the research supervisor, Dr Ruth Bridgstock via email at r.bridgstock@qut.edu.au or on 07-3138 8587.

CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE STUDY

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit via email at ethicscontact@qut.edu.au or on 07-3138 5123. The QUT Research Ethics Unit is not connected with the research study and can facilitate a resolution to your concern in an impartial manner.

Thank you for helping with this research project. Please keep this sheet for your information.
Appendix 8 – QUT Ethics Committee approval for online survey

Dear Mr Joe Campana

A UHREC should clearly communicate its decisions about a research proposal to the researcher and the final decision to approve or reject a proposal should be communicated to the researcher in writing. This Approval Certificate serves as your written notice that the proposal has met the requirements of the National Statement on Research involving Human Participation and has been approved on that basis. You are therefore authorised to commence activities as outlined in your proposal application, subject to any specific and standard conditions detailed in this document.

Within this Approval Certificate are:

* Project Details
* Participant Details
* Conditions of Approval (Specific and Standard)

Researchers should report to the UHREC, via the Research Ethics Coordinator, events that might affect continued ethical acceptability of the project, including, but not limited to:

(a) serious or unexpected adverse effects on participants; and
(b) proposed significant changes in the conduct, the participant profile or the risks of the proposed research.

Further information regarding your ongoing obligations regarding human based research can be found via the Research Ethics website http://www.research.qut.edu.au/ethics/ or by contacting the Research Ethics Coordinator on 07 3138 2091 or ethicscontact@qut.edu.au

If any details within this Approval Certificate are incorrect please advise the Research Ethics Unit within 10 days of receipt of this certificate.

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**Project Details**

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<td>Mr Joe Campana</td>
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<td>Other Staff/Students:</td>
<td>Dr Ruth Bridgstock, Prof Greg Hearn</td>
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<tr>
<td>Experiment Summary:</td>
<td>How individuals manage their skill and professional development is lacking within the digital content industry.</td>
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**Participant Details**

Participants:
Approximately 380
Location/s of the Work:
QUT

**Conditions of Approval**

**Specific Conditions of Approval:**
No special conditions placed on approval by the UHREC. Standard conditions apply.

**Standard Conditions of Approval:**
The University's standard conditions of approval require the research team to:

1. Conduct the project in accordance with University policy, NHMRC / AVCC guidelines and regulations, and the provisions of any relevant State / Territory or Commonwealth regulations or legislation;

2. Respond to the requests and instructions of the University Human Research Ethics Committee (UHREC);

3. Advise the Research Ethics Coordinator immediately if any complaints are made, or expressions of concern are raised, in relation to the project;

4. Suspend or modify the project if the risks to participants are found to be disproportionate to the benefits, and immediately advise the Research Ethics Coordinator of this action;

5. Stop any involvement of any participant if continuation of the research may be harmful to that person, and immediately advise the Research Ethics Coordinator of this action;

6. Advise the Research Ethics Coordinator of any unforeseen development or events that might affect the continued ethical acceptability of the project;

7. Report on the progress of the approved project at least annually, or at intervals determined by the Committee;

8. (Where the research is publicly or privately funded) publish the results of the project in such a way to permit scrutiny and contribute to public knowledge; and

9. Ensure that the results of the research are made available to the participants.

**Modifying your Ethical Clearance:**
Requests for variations must be made via submission of a Request for Variation to Existing Clearance Form (http://www.research.qut.edu.au/ethics/forms/hum/var/var.jsp) to the Research Ethics Coordinator. Minor changes will be assessed on a case by case basis.

It generally takes 7-14 days to process and notify the Chief Investigator of the outcome of a request for a variation.

Major changes, depending upon the nature of your request, may require submission of a new application.

**Audits:**
All active ethical clearances are subject to random audit by the UHREC, which will include the review of the signed consent forms for participants, whether any modifications / variations to the project have been approved, and the data storage arrangements.

End of Approval Document
Appendix 9 – QUT Ethics Committee approval for Interviews

**University Human Research Ethics Committee**

**HUMAN ETHICS APPROVAL CERTIFICATE**

**NHMRC Registered Committee Number EC00171**

**Date of Issue:** 24/7/13 (supersedes all previously issued certificates)

Dear Mr Joe Campana

A UHREC should clearly communicate its decisions about a research proposal to the researcher and the final decision to approve or reject a proposal should be communicated to the researcher in writing. This Approval Certificate serves as your written notice that the proposal has met the requirements of the National Statement on Research involving Human Participation and has been approved on that basis. You are therefore authorised to commence activities as outlined in your proposal application, subject to any specific and standard conditions detailed in this document.

Within this Approval Certificate are:

- Project Details
- Participant Details
- Conditions of Approval (Specific and Standard)

Researchers should report to the UHREC, via the Research Ethics Coordinator, events that might affect continued ethical acceptability of the project, including, but not limited to:

(c) serious or unexpected adverse effects on participants; and
(d) proposed significant changes in the conduct, the participant profile or the risks of the proposed research.

Further information regarding your ongoing obligations regarding human based research can be found via the Research Ethics website [http://www.research.qut.edu.au/ethics/](http://www.research.qut.edu.au/ethics/) or by contacting the Research Ethics Coordinator on 07 3138 2091 or [ethicscontact@qut.edu.au](mailto:ethicscontact@qut.edu.au)

If any details within this Approval Certificate are incorrect please advise the Research Ethics Unit within 10 days of receipt of this certificate.

### Project Details

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### Investigator Details

| Chief Investigator: | Mr Joe Campana |
Other Staff/Students:

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<td>Dr Ruth Bridgstock</td>
<td>Internal</td>
<td>Supervisor</td>
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<td>Prof Greg Hearn</td>
<td>Internal</td>
<td>Supervisor</td>
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Participant Details

Participants:
Approximately 12-15

Location/s of the Work:
Micro businesses

Conditions of Approval

Specific Conditions of Approval:
No special conditions placed on approval by the UHREC. Standard conditions apply.

Standard Conditions of Approval:
The University's standard conditions of approval require the research team to:

10. Conduct the project in accordance with University policy, NHMRC / AVCC guidelines and regulations, and the provisions of any relevant State / Territory or Commonwealth regulations or legislation;

11. Respond to the requests and instructions of the University Human Research Ethics Committee (UHREC);

12. Advise the Research Ethics Coordinator immediately if any complaints are made, or expressions of concern are raised, in relation to the project;

13. Suspend or modify the project if the risks to participants are found to be disproportionate to the benefits, and immediately advise the Research Ethics Coordinator of this action;

14. Stop any involvement of any participant if continuation of the research may be harmful to that person, and immediately advise the Research Ethics Coordinator of this action;

15. Advise the Research Ethics Coordinator of any unforeseen development or events that might affect the continued ethical acceptability of the project;

16. Report on the progress of the approved project at least annually, or at intervals determined by the Committee;

17. (Where the research is publicly or privately funded) publish the results of the project in such a way to permit scrutiny and contribute to public knowledge; and

18. Ensure that the results of the research are made available to the participants.

Modifying your Ethical Clearance:
Requests for variations must be made via submission of a Request for Variation to Existing Clearance Form (http://www.research.qut.edu.au/ethics/forms/hum/var/var.jsp) to the Research Ethics Coordinator. Minor changes will be assessed on a case by case basis.

It generally takes 7-14 days to process and notify the Chief Investigator of the outcome of a request for a variation.

Major changes, depending upon the nature of your request, may require submission of a new application.

Audits:
All active ethical clearances are subject to random audit by the UHREC, which will include the review of the signed consent forms for participants, whether any modifications / variations to the project have been approved, and the data storage arrangements.
Appendix 10 – Interviewee consent form

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT

Professional learning through social networks in digital content industry micro businesses
QUT Ethics Approval Number - 1200000121

RESEARCH TEAM CONTACT DETAILS

Joe Campana (Researcher)  
PhD candidate  
Creative Industries Faculty, QUT  
p: 07-3138 3890 | m: 0400 506635  
joe.campana@student.qut.edu.au

Dr Ruth Bridgstock (Supervisor)  
Vice Chancellor’s Research Fellow  
ARC Centre of Excellence  
Creative, Design, and Performance Faculty, QUT  
p: 07-3138 8587  
r.bridgstock@qut.edu.au

STATEMENT OF CONSENT

By signing below, you are indicating that you:

- have read and understood the information document regarding this study;
- have had any questions answered to your satisfaction;
- understand that if you have any additional questions you can contact the researcher directly;
- understand that you are free to withdraw at any time, without comment or penalty;
- understand that you can contact the Research Ethics Unit on 07-3138 5123 or email ethicscontact@qut.edu.au if you have concerns about the ethical conduct of the study;
- understand that the study will include audio recording; and
- agree to participate in the study.

Name: 

Signature: 

Date: 

Please return this sheet to the researcher.
### Appendix 11 – Interview key words and themes

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<td>Innovation</td>
<td>Industry associations</td>
</tr>
</tbody>
</table>
Appendix 12 – CD of additional survey data tables