

**Learning and teaching the art of sound design:
An analysis of best practices**

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Statement of originality

This work has not previously been submitted for a degree or diploma in any university. 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 in the thesis itself.

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Abstract

The aim of this study was to investigate the learning and teaching of sound design in higher education contexts. I examined two main aspects: firstly, an investigation into published resources, addressing sound design as creative practice, and, secondly, an examination of the relationship between technical process and creative skills development within curriculum design. I also investigated the perceived educational benefits of collaborative projects and other practical exercises, contrasting them with technical, skills-based learning. Finally, the study suggests avenues for future development that may provide better access to reference materials that support sound design students' development as creative, industry ready practitioners.

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Chapter 1: Introduction

In order to be a sound designer you have to start thinking about sound as raw material. You have to forget about the way things really sound, or at least be able to forget about it for a while, and think about how the sound makes you feel. In a way you have to be a kind of antennae walking around every day picking up sounds that you hear. (Thom, 2003, pp. 126-127)

Sound design is a technical art form in many ways: complex systems are engaged to create, record and then edit sounds, often using specialist equipment and software. The sound designer must be adept in the operation of this equipment and the associated workflows in order to be effective in their role. However, it is also imperative that the sound designer develops their creative abilities in order to envisage and create sounds that are appropriate to the task.

My research is informed by my experience as a professional sound designer and lecturer. I have observed that the methodologies used to teach sound design in higher education are perhaps less developed than those of other creative arts, and this may be detrimental to student learning and readiness for entering industry. This observation is supported through the following research, which identifies limited resources and current curriculum design as contributors to the problem.

The availability of reference material for students, such as literature and online content that addresses the creative, artistic or design aspect of sound design, is very limited.

Written material in particular that contains ‘hands on’ information about creative sound

design techniques is not well covered, and websites and other online resources, such as discussion forums or video sites like Vimeo or YouTube, also lack specific content for referencing creative sound design techniques. The result is that students cannot easily access a repository of content, irrespective of the medium, to help improve their skills as creative sound designers. The intent of this research is to determine the scale of this problem and to identify areas where improvements to resources can be made. The niche skills that relate to creative sound design and the fact that technologies and workflows evolve quickly may be responsible for this shortfall in content, and the extent of it. Associated issues are also be explored throughout the course of this paper.

I collated evidence through my ethnographic study of participants, which reinforced my initial hypothesis that sound design creative skill resources are limited and programs of study would benefit from the presence of more creative skills development. Through the literature and contextual review process, I determined that a knowledge gap existed in terms of available material. In terms of preparing students to enter employment, I found that the professional audio industry preferred sound design graduates to have more developed skills in the creative areas so that they could collaborate to produce creative work more effectively.

This research uses a qualitative model to establish opinions and themes from participants with experience that relates to creative sound design and the teaching of sound design. The research tool design incorporated an online survey sent to sound designers, teachers of sound design and students of sound design, followed by further interviews with

selected participants from these three groups. Online surveys were chosen as they are convenient for the end user and allow for easy tracking of responses. The follow up interviews were necessary, as additional detail was required from specific participants, giving them an opportunity to discuss the subject and, potentially, to introduce new ideas based on their own experiences. These interviews were semi-structured and were used to determine an identifiable trend amongst the participant groups in relation to the original research problem.

The participants were asked several questions related to their experience of sound design teaching in higher education, with the following themes for each participant group:

Students were asked about the teaching of sound design and their access to resources during their studies. This was to gauge the breadth of skills and experience gained during study and how this prepared them for entry into industry. Teachers were asked to comment on and critique sound design teaching and learning, in general and in their own program. Sound designers were asked to comment on both the skills required to practice as a sound designer in industry and on their experience of graduates from existing teaching programs.

The data produced from the surveys and interviews helped to determine the balance of creative skill development versus technical skill proficiency that is typically delivered as part of a course of learning, and also to see if the industry would be more effectively serviced if this balance was adjusted, or if it is currently satisfactory. The data also helped to determine the teaching effectiveness of particular techniques; for example, in programs

where sound design techniques are demonstrated to students versus those where the demonstrations are more technical or process focused.

The answers to the survey questions and the interview responses are used extensively in this document and the participants are represented in the following manner: (P) professional sound designer, (T) teacher and (S) student, followed by a number, which identifies the individual participant for example (T6, 2016).

Chapter 1 introduces the thesis and identifies the problem that led to the projects inception. It also gives the reader an overview of the methodologies employed and the participant groups. Chapter 2 focuses on the literature and contextual review in terms of sound design. The chapter will look at the following areas: the role of sound design in film, the role of the sound designer, and a study of the material generally featured on recommended reading lists made available to students. The chapter reinforces the idea that sound design is a powerful and important aspect of different mediums and that it is used to provide emotional context, atmosphere, a sense of place and time, and creates immersion for the listener/viewer.

Chapter 3 studies the teaching and learning of sound design. Sound design pedagogy is compared to the teaching techniques of other creative arts, including dance and music, and the concept of teaching and encouraging creative development is explored, again citing examples from other creative arts as a point of comparison. Chapter 4 details the research tool design and profiles the contributing research participant groups. Chapter 5 is an analysis of the data collected from questionnaires and interviews that took place

between the researcher and the participants. Chapter 6 gives a conclusion to the findings and presents recommended methodologies to be used to progress sound design pedagogy and to improve the learning and teaching of the art form. It also looks ahead to additional research that could explore aspects of this project in greater detail. The Appendices contain three articles, written by me and published in the international sound technology magazine *Sound On Sound*. These articles specifically cover the teaching of hands-on sound design techniques.

Chapter 2: Literature and Contextual Review

In this chapter, I will look at the role of sound in film, defining the ways that sound design affects the viewer/listener. I will explore written resources relating to sound design with a focus on those resources that are recommended to sound design students as part of their core learning, and will then provide a critical analysis of those texts. I will also look at other mediums that sound designers may engage with, such as websites and forums, and critique the content typically found there. Firstly, I will look at the distinctions I make throughout this paper between creative sound design skills and technical sound design skills, as they are both fundamental to effective sound design teaching and learning.

Technical skills

Recording is very technical and more science than art. Sound design and mixing, however, are far more art than science (Viers, 2008, p. 196).

The creation of sound that is clean and well balanced requires a specific set of skills and knowledge. Viers states that, “it is very important to understand the technology and science behind our craft in order to produce innovative and quality sound” (Viers, 2008, p. 35). Generally, this begins with underpinning theory that covers sound physics, including occlusion, distance attenuation, perspective and absorption, and after that an understanding of the recording chain, which is a system that consists of all the components necessary to record and play back sound. Each recording industry has unique

needs that can affect this setup. “For field recording, the recording chain can be just a microphone, a field recorder, and headphones for example” (Viers, 2008, p. 56).

The basic principles of audio engineering, including signal paths, gain structure, the use of dynamic effects such as compressors and limiters, and the use of time-based effects such as reverb and delays, are required knowledge in both production and post-production phases of the process. “Compression in particular is a crucial area to understand because when the audio is squashed into a narrowed dynamic range, it is better controlled and will fit into the mix easier and appear to sound more full” (Hibbard, 2014). Understanding editing conventions is extremely important and is a necessary underpinning for the required skills in using sound editing software. Many of the traditional hardware processes that originally involved physical patching, such as gates, reverbs and compressors, are now emulated in DAWs (Digital Audio Workstations), such as Pro Tools or similar. Having a strong familiarity with these software packages allows the creative process to flow without obstruction.

Technical skills differ slightly between mediums, and an understanding of the technological requirements for media such as film, television, animation, video games, live sound and others is recommended. In filmmaking, the sound designer is most engaged during the postproduction phase, as they build a collage of sounds against edits of the vision, layering atmospheres, foley and sound effects as a response to the creative needs of the project.

In video game development, a larger component of the sound designer role is assigned to the implementation of sound assets within a 2D or 3D game environment, which means that, typically, the game's sound designer is engaged with pure technical processes that is "completely absent from audio post production" (Rovin, 2010). This is due to the nature of this interactive medium, where sounds are created, implemented and tested in isolation from one another.

Mixing and mastering is common to the different mediums and requires an understanding of compression and other dynamic effects, along with time-based effects such as reverb and a knowledge of file formats and mixing standards. A grasp of these technical skills gives the sound designer the ability to interface competently with the various technical processes that can comprise a sound design project, and to work efficiently with the equipment and technical resources available to him or her.

Creative skills

Creative skills refer to the sound designer's ability to produce work that is effective in capturing the mood, emotion, atmosphere, or message within a piece, demonstrating "imagination, independence and focus". It is the choice of sounds used, the tapestry of layers woven together to produce a soundtrack that immerses the viewer in the world portrayed; the way each of the sounds blend in terms of their tonal and dynamic quality to produce a compelling experience for the listener and viewer.

To become adept in this area of work, the sound designer must have a good working knowledge of effective film and film sound conventions, and may learn a great deal from the study of movies that have received wide recognition for their sound design.

“Critical listening, creativity, and the ability to innovate” (T8, 2015) are themes presented in this thesis. Combining technical and creative skills can be challenging for students.

The high level of technical interface required for sound design work, can cause students to look past the creative vision and become more concerned with the machinations of the software and hardware they are operating; they can become “focussed on the gear they have *instead* of their own particular talent” (P1,2016).

In his article prefaced with a note that “this article is not promoting ignorance, it is promoting focus”, photographer Aaron Nace discusses his relationship with the tool of his trade, the camera: “all the technical stuff will take care of itself. Your job as a photographer has almost nothing to do with a camera. Your job is to capture the minds and imaginations of people and pull them into different worlds” (Nace, 2013). This philosophy also applies to sound design, where the practitioner must work towards the creative vision using an array of hardware and software but not to allow themselves to be obstructed by technical processes or technical choices.

The topic of technical and creative skills is one that is frequently discussed on sound design forums. Thom illustrates his argument that sound design is predominantly a creative skill by comparing two figures, the fictitious character Harry Caul, a highly proficient technical sound recorder and main protagonist in Coppola’s *The Conversation*

(1974), and the film's sound designer, Walter Murch, an esteemed sound designer known for his work on *Apocalypse Now* and *The English Patient*. Thom informs us that the technical skills of Caul are important, but if we want to improve the ways movies use sound, and to improve our own status in the industry, "we need to spend more time trying to think like Walter Murch and less time trying to think like Harry Caul" (Thom, 2010). He acknowledges that a balance must be found between the technical side of sound design and the narrative-driven storytelling side.

Film sound

As I discuss sound design throughout this paper, I most commonly refer to film sound to illustrate examples. Sound design is, arguably, more developed across film than any other medium. Consequently, courses that cover sound design theory tend to use examples from films as a way of showing the complexity and the effects of the design process.

Various contributors have discussed the role of sound design in film and other mediums. Svensson draws from a long career in film sound and provides an overview on the role that sound plays within film. He describes sound as being "an emotional experience, heightening the feelings" and that cinema "in its highest sense, is a total experience of sound and vision" (Svensson, 2003, p. 117). Several notable film directors, including David Lynch, understand the relationship between sound and picture within filmmaking. Lynch has a history of utilising sound design early in the production to help establish tone and ideas. Sound is "50 per cent of a film", according to Lynch, and "in some scenes it is 100 per cent. It's the thing that can add so much emotion to a film. It's the thing that

adds all the mood and creates a larger world. It sets the tone and is a great ‘pull’ into a different world” (Lynch, 2003, p. 52). The ‘pull’ Lynch refers to relates to the way that sound creates immersion and draws the viewer or listener into the scene. Tomlinson Holman expands on this when he categorises the specific roles of sound in film, the most notable among them being the “subliminal narrative role” (Holman, 1999, p. 11), where sound is working on the subconscious of the audience. “While all viewers can tell apart the various objects in a picture – an actor, a table the walls of a room – listeners barely ever perceive sound so analytically. They tend to take sound in as a whole, despite its actually being deliberately constructed from many pieces” (Holman, 1999, p. 11).

To achieve the immersion that Holman and Lynch describe, the sound designer creates a tapestry of sounds that range from atmosphere sounds, Foley sounds that provide life to the characters and spot effects that illustrate sounds relating to objects or events. These individual components are mixed together alongside dialogue and music to support the narrative and individual story beats. Holman emphasises the storytelling potential of that process, by noting the role of a “willing suspension of disbelief” (Holman, 1999, p. 11) as the way the films provide “a route to emotional involvement in the material by the audience” (Holman, 1999, p. 11). This suspension of disbelief mostly exists because of a lack of public knowledge about the way film sound is constructed.

Randy Thom, a well-known sound designer and contributor to many essays on the creative force of sound design, elaborates on Holman’s assessment and discloses the creative thinking behind the sound track that was designed for the 1977 movie

Apocalypse Now: “In the opening scene of *Apocalypse*, Captain Willard is the ear. The first sound you hear is the electronically synthesized helicopter ... It’s not so much a helicopter that we’re hearing ... it’s Captain Willard’s brain that we are listening to” (Thom, 2003, p. 124). The described design of the helicopter sound is indicative of a creative process that exists between the filmmaker and the sound designer, where the theme and emotional tone of the film is interwoven with the visuals and the sound. This may be a process that begins early in the production, as was the case here, allowing Murch to become fully involved in exposing the consciousness of the Captain Willard character and to use creative expression to move the film in and out of conventional sound design. Here, Murch elaborates and describes the contrast he uses to signpost the listener to the intent of the narrative; in this case, moving from an ethereal dream-type state into conventional sound design where sounds are tied to on-screen events that support the visuals. “It’s dramatic and it’s fantastic, but it is fairly much “what you see is what you hear” (Murch, 2009).

Understanding filmmaking concepts is an essential skill for student sound designers to learn, allowing them to engage with the creative vision and to contribute to the team of individuals responsible for music, sound and dialogue throughout production.

For this process to run smoothly, the sound designer should possess an understanding of the breakdown of each scene and the intent of the director, cinematographer and picture editor. This understanding is not an end in itself, but is used to inform creative decisions. “What they finally remember is not the editing, not the camera work, not the performances, not even the story, it’s how they felt” (Boyd, 2014). Walter Murch,

although best known as a sound designer is also an accomplished picture editor, refers to having an ‘eye’ for the visual nuances that he uses to determine cuts or edits, with each creative decision designed to support the narrative of the film.

Murch elaborates further on the creative process, describing here his creative journey on the film *The English Patient* and the challenge of creating sound design for the desert environment featured strongly in the film. His use of non-literal sound design helps to convey a desert ambience, evoking the sound of an environment that is silent, “by adding insect like sounds that realistically would probably not be there” (Ondaatje, 2004, p. 2), suggesting to the listener that this is a vast empty space where tiny sounds play a larger role in the soundscape.

Reading lists

As part of my research into the use of sound design resources, I have examined the recommended reading lists assigned by sound design courses within Australia. By comparing these reading lists as a whole I noticed that several titles are commonly recommended and appear repeatedly across the group of courses looked at.

Table 1:

<i>Institution name:</i>	<i>Course Info</i>	<i>Sonnenschein, D. (2002). Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema</i>	<i>Lobrutto, V. (1994). Sound-On-Film: Interviews with Creators of Film Sound</i>	<i>Viers, R. (2008). The Sound Effects Bible: How to Create and Record Hollywood Style Sound Effects</i>	<i>Chion, M. (2005). Audio-Vision: Sound on Screen</i>
SAE: School Of Audio Engineering	https://sae.edu.au/courses/audio/bachelor-of-audio/	✓	✓	✓	✓
JMC Creative Academy	http://www.jmccademy.edu.au/courses/audio-engineering-sound-production.aspx	✓	✓	✓	✓
Griffith University	https://degrees.griffith.edu.au/Course/Overview?CourseCode=7655GFS	✓	✓	✓	✓
RMIT University	http://www1.rmit.edu.au/courses/c5198vart5856c1105	✗	✗	✗	✗
Swinburne	http://www.swinburne.edu.au/study/courses/units/Sound-Design-and-Acquisition-FTV10005/local		✗	✓	✓
University Of Adelaide	https://www.adelaide.edu.au/course-outlines/108269/1/sem-1/	✓	✗	✗	✗

To determine if the popularity of these particular titles is recognised commercially as well as academically, I examined the ‘top ten’ sound design book lists published by retailers and review sites.

Table 2:

<i>Recommended By</i>	<i>Info</i>	<i>Sonnenschein, D. (2002). Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema</i>	<i>Lobrutto, V. (1994). Sound-On-Film: Interviews with Creators of Film Sound</i>	<i>Viers, R. (2008). The Sound Effects Bible: How to Create and Record Hollywood Style Sound Effects</i>	<i>Chion, M. (2005). Audio-Vision: Sound on Screen</i>
Amazon.com	https://www.amazon.com	✓	✗	✓	✓
Good Reads	https://www.goodreads.com/shelf/show/sound-design	✓	✗	✗	✓
Film Sound.org	http://filmsound.org/newbooks.htm	✓	✗	✓	✗
Designingsound.org	http://www1.rmit.edu.au/courses/c5198vart5856c1105	✓	✗	✓	✗

The data suggests that the four titles detailed here are the most popular of the currently available resources that relate to sound design, with Sonnenschein's book *Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema* featuring strongly and considered across academic and commercial sources to be the most highly recommended book.

Across this analysis, I also discovered that the featured titles tend to fall into two main groups, in terms of content. The first group are accounts of, or deconstructions of, sound designs from specific films or other media, with interviews or insight into the creative process that drove the final designs. The second group can be described as technical guides to recording, editing and mixing, and provide an overview of the workflows considered to be best practice.

Creative sound resources

The first group features a range of seminal texts: The afore mentioned Michel Chion's *Audio Vision*, David Sonnenschein's *Sound Design: The Expressive Power of Music, Voice and Sound Effects in Cinema* and Vincent Lobrutto's *Sound on Film*. They are standards in recommended reading lists for students and cover sound design, audio post production and film production. Chion's revered, and much referenced, *Audio Vision* gives the reader insight into how the combination of sound and image have the ability to immerse the viewer in stories and fiction. Through this and other works, Chion demonstrates to the reader the potential that sound design has to pull a viewer into the story and to add a dimension to the director's vision. The book also functions as a historic

account of the evolution of film sound, the relationship between sound and picture within cinema, and how sound design itself has evolved both technically and creatively through the ages. In this example, Chion demonstrates the conscious and subconscious power of sound design in narrative, alerting the viewer to the dark intent of the male character walking the female character next to a cliff: “The spectator experiences a vague anxiety ... Where did our premonitory anxiety come from? From the fact that over this magical landscape not a single birdsong is heard’ (Chion, 2005, p. 133). Chion uses direct examples like this throughout his work in order to demonstrate the ability of sound to subconsciously signpost themes and ideas. This remains useful for students even in cases where the example itself is somewhat dated, since the design principles are still relevant.

LoBrutto’s book *Sound on Film* is, essentially, a series of interviews with notable sound editors, sound designers and other sound professionals with careers in film. LoBrutto’s informal interviews lead the interviewees back through their careers as he encourages them to share their creative processes with the reader. When read alongside Chion, this book provides the reader with additional historical context in the development of film sound. LoBrutto interviews Sound Designer Gary Rydstrom, who describes the creative process that developed for the film *Back Draft* (1991). In this example, he discusses his ideas for adding subtle animal sounds to a fire sound; his intention being to give life to the fire and to suggest wild and animalistic qualities – “subconsciously it gives an intelligence or a complexity it wouldn’t normally have. There is a complexity to natural sounds, especially animal sounds, that is really wonderful” (LoBrutto, 1994, p. 231). The insights provided by these books allow students to understand how sound designers

create and manipulate their designs to serve the thematic and emotional tones of the film, and also goes some way in revealing how sound designs can evolve over the period of the production as ideas take shape.

Technical process

The second main group of books relates more specifically to technical process and can be referenced by students where direction is needed on recording, editing or mixing.

In his work *Designing Sound*, Farnell describes processes relating to the synthesis of sounds. He explores the concept of procedural sound, which allows a sound designer to synthesise sound from the ground up through the technical application of synthesising equipment. (Farnell, 2010). It represents a fascinating facet of sound design and is one with particularly strong applications in real time sound modelling; for example, video games or digital media, where the sounds represented must manipulate themselves according to inputs given by the player or end user. Useful as a reference guide for key situations where a dynamic or interactive type sound asset is required, Farnell demonstrates the possibilities of using synthesised sound in conjunction with, or even replacing, traditionally recorded sounds. Given that the book has a very specific goal in mind, it seems that this title, as a reference work, would be for occasional use and specific application.

Viers' work, *The Sound Effects Bible* (Viers, 2008), is also a useful reference that addresses traditional technical processes like recording, editing and mixing sounds. This title is popular on retailer sales lists and is commonly recommended to students. Viers

draws from his experience as a film recordist and sound designer to compile some practical descriptions of capturing sound effects, ambiences and other sounds. The strength of the book lies in the accessibility of the language in the description of process. “Sound design is all about creativity. Period. There is no right way, only better ways. Let your imagination run wild when trying to figure out solutions for different sounds” (Viers, 2008, p. 196). It is a useful guide for students, particularly in terms of field recording techniques and recommendations for equipment. His description of sound design techniques is slight in relation to the rest of the book, occupying only one short chapter. Again, Viers chooses to describe the raw technical processes that comprise sound design, such as layering sounds together, mixing for emphasis, manipulation through pitch and other techniques.

The two common themes across the books assigned to students as part of their recommended reading are creative accounts and technical instruction. The noticeable deficit is in materials that detail the creative process in a more direct and instructional way, with explanations as to how certain techniques or ideas can be implemented by the sound designer. Chion’s and LoBrutto’s works describe a creative process conversationally, but they do not instruct the reader on specific techniques. This type of tutorial falls outside the scope of these books and, instead, their usefulness comes from reading an account of how a creative idea developed alongside the needs of the film and the director’s vision. As my data shows Sonnenschein’s book *The Expressive Power Of Music, Voice And Sound Effects* is the most popular single title across recommended reading lists. The book succeeds in stepping closer to providing creative tuition through

its thorough description of the specific processes involved in sound design. Although dated, as the book was first published in 2001, the working processes described in the book are a useful reference for sound design students, and Sonnenschein's approach of encouraging the reader to experiment is an effective way of making connections between the application of sounds and the resulting effect on the listener/viewer. This title is likely the most effective current resource for students, and Sonnenschein himself is a regular contributor to forums and sites that discuss sound design, making him directly accessible to students in some cases. Sonnenschein sets the scene at the beginning of his work by assessing the role of sound designer as a "creative force reliant on technical process, immersed in the story, characters, emotions, environments and genre of the film whilst balancing the technical parameters of completing a film on time, in budget and with the tools and personnel at hand" (Sonnenschein, 2002, p. 17). He uses that as a starting point to explore the creative and technical aspects in more depth throughout his work.

Other media

Sound design as a creative practice, with emphasis on the development of themes and ideas that reinforce narrative and tone, is a common theme in other media, including online articles or short essays, and informal discussions on active sound design forums.

In his essay published on the *Designing Sound* online resource, Marks reinforces the view that effective sound design must work to support the narrative. He emphasises the importance of the story and the wisdom of focusing on "details for effective storytelling to create an immersive experience necessary for the story" (Marks, 2010).

Designing Sound represents one of the few websites that refers to creative sound design, and in several areas the content is more relevant to the student sound designer than traditional book learning might be. It is more up-to-date, and often the details of the authors are included, or a comment section is available allowing the user to interact with the writer. Berger contributes to one of many online discussions that cover the essentials of ‘how to get started in sound design’, which often lead into discussions on creative sound design skills and ideas. He advises students and young sound designers, and stresses the importance of a broad education and the value of curiosity: “Learn about ideas ... as long as you are exposed to many different ways of thinking about the world, and develop a passion for expressing your ideas” (Berger, 1999). These forums are a key source of information for less experienced sound designers looking to gain skills and knowledge from their peers.

Generally, though, the limited availability of resources across printed media also extends to online resources, and again the missing element is content that specifically addresses creative skill development. Forum user Yin notes the relative scarcity of creatively driven discussion, even across new media, such as in internet forums. I do wish there can be more conversations, especially on this list, on how to improve that artistic side of our skills, not how to make new sounds, not about equipment and plugins, but about how to engage story telling in our design (Yin, 2010).

In an attempt to bridge the gap myself and to create content that discusses creative process and ideas, I have written and published three articles for the UK sound technology magazine *Sound On Sound* that address varying aspects of creative sound

design and offers professional opinion on best practice to approaching creative challenges. In this example, I discuss using layering techniques to create engaging and impactful explosion spot sound effects.

In total this explosion sound now comprises five separate elements and has the benefit of being richer, more vibrant and more sonically interesting. You can also control the levels of each of those separate components in the mix since they are all separate audio files. For example, a distant-sounding explosion would have less of the close-up detail provided by the metallic sounds and the debris raining down (Metcalf, 2013).

By using a combination of screenshots from my DAW (Digital Audio Workstation) sessions and descriptive language, I am able to describe my own creative process effectively through the articles and provide sound designers with specific reference to technique that they can replicate and then apply in their own practice.

In this second example, I describe the process of creating powerful impact sounds such as an arrow hitting a tree. How can the sound designer develop sounds to make the impact powerful and detailed?

Whether it's an arrow flying through the air, a cricket ball, or a clenched fist, a 'whoosh' sound just prior to the impact will add greater movement and dynamic. ... Experiment with leaving a beat of silence just before the impact as this will accentuate the impact sound itself, since your ears have had a moment to collect themselves before the sound hits. (Metcalf, 2013).

Overall, these articles represent part of an ongoing project. They offer examples of direct sound design skill teaching and are a response to the limited availability of resources in

this area. These articles have begun to be cited as a useful resource in recommended reading lists for sound design students.

Conclusion

Sound design is a discipline with a strong focus on creative expression and creative experimentation. As we have seen from the examples cited here, sound is a fundamental part of the overall presentation of a film, immersing the viewer in the story and emphasising the emotional tones and themes. The development of skills to allow for creative expression is fundamental for the student sound designer looking to engage with the industry and to be employable.

Unfortunately, these students find themselves disadvantaged in terms of resources, as the available literature tends to focus on anecdotal accounts of sound designs or technical guides that deliver basic skill sets and document recommended workflow. Students can also explore other avenues, but alternative resources, such as internet forums and other online resources, are also limited in the type of content that will directly engage with the creative development of a sound designer. My authored articles, published in *Sound On Sound* across 2013/2014, represent rare examples of material that sound designers can use to help them develop or sharpen existing creative skills. In addition, we have established that in the learning of technical process it is also important to focus on creative goals. As a follow on from these findings, it is now necessary for me to look further into the teaching and learning process as it relates to sound design.

Chapter 3: Learning sound design

If one wishes to study sound design for film/television or games, the options available generally involve taking a sound design unit as part of a program that may cover film production, audio engineering or music composition. The teaching techniques and program design currently used to teach sound design to students vary between course type and institution. As part of this study, I have looked at several programs in conjunction with my own experiences of teaching this subject. To demonstrate the niche that sound design occupies within the arts and the fact that it is a small industry I have identified that less than twenty courses teach sound design within Australia. Of those courses the majority relate to film sound and are taught within programs where filmmaking or sound technology is the core focus. The design of the curriculums generally position sound design units or creative sound design assessments at the latter part of the curriculum.

Table 3:

Provider & Course name	Sound Design unit/assessment	Position in course
JMC: Bachelor of Audio Engineering and Sound Production	Post Production Audio	Unit 22 of 24 units
SAE: Bachelor of Audio	Major Project Development	Trimester 5&6 (of 6)
University Of Adelaide	Creative Project	Week 14 of 15
RMIT	Creative Exercise	Week 7 of 17

This model represents a traditional curriculum design with the consideration made that students require time to become technically proficient and have an understanding of

theory before they engage with creative development. The RMIT example is interesting, as this curriculum does not engage students with any creative work until week 7 of 17, with the preceding weeks assigned to theory. As I will determine during this research, sound designers, students and teachers that participated in the survey advocate a model that includes creative development throughout the full course duration.

The challenges of curriculum design around subjects that contain sound design were discussed as part of a conversation I had with a Queensland university. This curriculum features several programs in which sound design is taught. The university commented that they were currently in the process of redesigning their sound engineering and sound design programs to focus more on the creative and collaborative skills that students need to succeed in industry. The discussion centred on a change in the teaching model, and the university was looking at re-designing their curriculum in response in recognition of similar issues to those raised throughout this research.

A traditional curriculum in sound design/sound engineering may follow a structure similar to this example set across a three-year program:

Period 1: Students are introduced to basic concepts such as the physics of sound and digital audio theory and are introduced to equipment and workflows.

Period 2: More complex processes are shown – students demonstrate knowledge through exams, and assessments where they repeat the processes

shown. Branches of sound engineering, including postproduction sound and live sound, are also introduced.

Period 3: Students work on final projects and perhaps collaborate with other students to create projects.

In this structure, the first two periods of programs focus on process, workflows and ‘how things work’, which dominates the learning. In general, students are not stretched creatively and imaginatively until Period 3. The university has recognised areas for improvement in this model, and commented that in order to equip students with skills that are required by industry an evolution in curriculum design may need to take place. They are proposing that students are taught the fundamental knowledge they need to understand equipment and processes all the way through their learning, alongside collaborative industry-like projects within the university environment that promote development of creative skills. This might mean that collaborative projects occur across the three-year program in each semester and that the focus shifts away from reproducing steps shown in a lecture to that of taking on a project brief and interpreting it creatively within groups.

According to this university, the catalyst for these shifts in curriculum design are students that have, in previous years, passed through an entire learning process with relatively underdeveloped collaborative and creative skills within sound design or sound engineering.

Developing creative skills within student learning is a challenge that educators face with their teaching and learning methods and their curriculum design. But how do we encourage creativity amongst students? Peter Webster notes in his essay ‘Creativity as creative thinking’ that the word ‘creativity’ is such a broad term that the meaning itself is diluted. Instead he advocates for a “more focused term to be used” (Webster, 1996, p. 82), stating that one of the “main problems we face is the use of the word creativity itself ... It has been used in so many contexts that it has lost much of its meaning and power, especially in terms of music and children. In the educational context it might be prudent to use the term ‘creative thinking’” (Webster, 1996, p. 82). Sennett echoes this, favouring a more pragmatic approach in his own writing, where he eliminates the word as much as possible from his study on craftsmen, suggesting that it carries too much “Romantic baggage—the mystery of inspiration, the claims of genius” (Sennett, 2009, p. 2), and it is, therefore, a problematic misconception.

Robinson also notes that creativity is a problematic term due to elitist connotations. In his view, “creativity is often seen as a gift bestowed upon a lucky few by divine benevolence. This idea presumes two things: a preordained talent and a lifelong devotion” (Azzam, 2009), which, he suggests, are misnomers, reminding us that creativity is “not beyond anybody’s reach” (Azzam, 2009). He also alludes to an idea that creativity comes from doing, shaping and refining an idea, which relates closely to the development of skills that a student will experience over time: “To be creative, you have to be doing something. This is a very practical thing. It is the process of having original ideas that have value” (Azzam, 2009). He is essentially endorsing the idea that creativity

skills develop within us as a product of practice and application, rather than through theoretical study alone.

Livingston offers a view as part of his essay *Teaching Creativity in Higher Education* that encourages teachers to consider methodologies outside of the usual classroom format in order to teach creativity. He states that if an educational goal is to hone creativity, “it can best be achieved by pedagogies that maximize opportunities for students to practice being inventive ... a skill that can be developed and refined over time” (2010, p. 59 Livingston), alluding to the idea that practical work can lead to the development of creative skills.

Practical learning

Within existing study programs, the participant teachers in this research spoke of techniques they use to encourage creative thinking. These techniques often have grounding in practical learning, i.e. learners that learn by ‘doing’ as opposed to audio or visual learners that can be more adept at learning by watching/observing or listening and making notes. Dunn & Dunn note observations made around this with the teaching of schoolchildren that reinforce observations across the arts that practical learning is an intrinsic part of skill development. Stating that children enter kindergarten as kinaesthetic and tactile learners, moving and touching everything as they learn, by second or third grade, some students have become visual learners. During the late elementary years, some students, primarily females, become auditory learners. “Yet, many adults, especially males, maintain kinaesthetic and tactile strengths throughout their lives”

(Dunn, 1978, p. 231). Hands-on teaching techniques are “gaining recognition because they address the challenging needs of practical learners, as well as the diverse needs of auditory and visual learners” (Feldman J. and McPhee, 2007, p. 65). Students can be encouraged to develop their creative skills through project and extracurricular work so that practical learning continues outside of the classroom.

Within the area of creative sound design discussion and outside of traditional book and journal contributions, the sound design online community provide readers with a means of interactive discussion around any theme relating to sound design. Across these online groups the notion that sound design is a subject that many can best learn by ‘doing’ is a common theme:

Q: What’s the best way to learn sound design?

A: Just start doing it. Don't even Google it or look on Quora anymore. Seriously - find a random clip from a movie you love (or if you want to make it more realistic, a movie you hate), throw it in Pro Tools, and just start replacing everything with your own sound design. Hack it together as best you can before looking for a "how-to" somewhere else. I promise you'll learn more, and learn faster by just diving into the deep end. (Young, n.d.).

As a side note, an academic problem that presents itself here is that misconceptions about teaching and learning can easily propagate among online communities. In this case, the over simplification of the sound design process suggests to the reader that sound design is relatively straightforward and that sound designs can be created easily, through trial and error, which is obviously not the case. Although elements of this are useful, as the reader is encouraged to experiment and improvise, the grounding of creative theoretical

knowledge required to ‘design’ is missing from the process. This is the element that can be taught and encouraged within a structured learning program, where a student is guided through their learning as opposed to being self-taught. The validity of content found online needs to be considered by the user in these situations, as the strength of having multiple users contributing opinion can also create an issue when those users lack expertise.

The challenge that exists for educators is to design curriculum that allows students to grow creatively while still taking on board the required technical know-how. Marks comments that how you acquire the skills and creative knowledge is important, and that exposure to other sound designers can be valuable. He notes the value of “learning on your own or attending a formal college program, both with their own advantages and disadvantages”, but goes on to say “[l]earning from other sound designers and incorporating those skills will make you even better.” (Marks, 2010).

It is also clear from the design of programs and the contributions made to this study that within sound design teaching and learning, as with all the creative arts, there is emphasis on the students themselves to push their learning ahead and to expose themselves to experiences where they can practice and develop skills. Saucier describes a process to encourage students to become more autonomous in achieving their learning goals. He suggests that students need to take ownership, and therefore responsibility, of their own learning: “[I] use pedagogy that encourages students to move beyond what they read to gain a deeper understanding of the material while learning how to apply the theories and concepts they’ve studied in a practical manner” (Rick D. Saucier, 2015, p. 64).

Conclusion

Sound design itself is a relatively new art form when compared to music and dance, which both feature well-developed teaching and learning models. Dance pedagogy, for example, has evolved over a much longer period and the modern approach to teaching in this area encourages students to experiment, choreograph and take creative risks, which differs from teaching from only a generation ago, where students focused more on the technical aspects of performance. The balance between creative skill development and the learning of technical skills across both music and dance allows students in these areas to significantly develop their creative skills across the duration of a program and to emerge as a potential practitioner armed with relevant skills when complete. Within sound design, the curriculums have largely, as yet, responded in the same way, and, as we have seen, they tend to front-load the course with technical learning. Thus there is scope to learn from the design of other art curricula.

The skills and knowledge of teachers themselves is also a factor in the overall effectiveness of the learning programs. Foster has observed that ballet dancers cannot necessarily switch modes and become ballet teachers due to the differences in required skills. The skills and knowledge relating to a teacher or a practitioner differ, and so the same challenge may exist for experienced sound designers to transition into teaching roles.

Learning by doing is a strong theme that relates to sound design learning; research participants referred to it many times. In modern dance and music teaching, students are encouraged to participate in practical learning in order to develop creative problem solving skills, and in sound design it is likely that practical learning is the more effective method of learning and engaging with creative ideas. In order to determine whether this hypothesis is relevant, the next stage is to gather data from students, sound designers and teachers.

Chapter 4: Method

This chapter describes the research methods used in this study, including the research participants, the data collection instruments and the methods of ensuring the validity of this research.

My personal experience in teaching and learning sound design comes from a career in which I have over ten years' experience producing audio content for video games and television projects. In recent years, I have moved into lecturing and have taught sound design units as well as units that contain sound design as a core focus, such as audio postproduction, game audio, and audio for interactive technologies. My experience has given me an insight into the methods used to teach sound design as prescribed by curriculum. My industry experience working with clients, other audio professionals and graduates has given me insight into the requirements of a sound designer and the day-to-day expectations and responsibilities of the role.

I currently work as a faculty leader within a vocational training RTO (Registered Training Organisation) based in Brisbane, Australia. This role nurtures my interest in education as it involves the development of course materials, research of pedagogical techniques for vocational teaching and hands-on training with students. I am also the author of several published articles in the UK-based sound technology magazine *Sound On Sound*. These articles aim to teach the reader hands-on methods that can be used to improve their sound design skills and have a focus on encouraging creative thinking.

In terms of this research, my position as a sound designer and occasional lecturer may influence my own perspective on this study. This is an issue that is often associated with qualitative research. Bogdan & Biklen cite that “qualitative researchers ... have wrestled over the years with the charges that it’s too easy for the prejudices and attitudes of the researcher to bias the data and therefore this represents a risk” (Bogdan R & Biklen, 1982, p. 28). My professional background and observations give me a strong insight into the issues I have described, but, by its nature, qualitative research is itself subject to charges of bias due to it not deal with data in the same way as quantitative research and being open to interpretation of opinions based on evidence presented. “Critics of qualitative inquiry have charged the approach as being too subjective because the researcher is the instrument of both data collection and data interpretation and because a qualitative strategy includes having personal contact with and getting close to the people and the situation under study” (Patton, 2014, p. 57).

Part of this process involves recognising which aspect of the research is most likely to be affected by bias, and, as Sarniak notes, “while the nature of your research may be argumentative, favouring a preconceived position on the subject you are investigating will cause bias in your results. You will have the tendency to steer the results of your study to the direction that you want” (Sarniak, 2015). Understanding this risk helps me to follow best practice in avoiding the issue, which is to interpret accurately the results of the data and to avoid manipulating the results. In addition, the design of the questions in both the online survey and the follow up interviews utilise *open questioning*. Sarniak advocates for this approach, suggesting that bias in qualitative research can be minimised

if you know what to look for and how to manage it. By asking quality questions at the right time and “remaining aware and focused on sources of bias, researchers can enable the truest respondent perspectives and ensure that the resulting research lives up to the highest qualitative standards” (Sarniak, 2015).

The methodology I have used is essentially qualitative, comprising of a survey in which participants provide responses to questions covering sound design resources, teaching and learning, and industry requirements, followed by an interview phase where selected participants were invited to discuss their views in more detail. Creswell refers to qualitative research being a means for “exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, 2014, p. 4). This approach allows the participants to express their views and opinions about sound design through the lens of their own unique experiences. These individuals’ views, and the common threads of opinion that the participants share, are the crux of the research. Creswell states, “those who engage in this form of enquiry support a way of looking at research that honours an inductive style, a focus on individual meaning and the importance of rendering the complexity of the situation” (Creswell, 2014, p. 4). This approach serves to reinforce and add additional detail to individual responses.

The subject matter, teaching and learning within sound design, has not been studied in depth before and therefore the approach taken was to gather qualitative opinion on the extent of the research problem, which itself may lead to further quantitative study. This method is well established in research circles, and Creswell states that “if a concept or

phenomenon needs to be understood because little research has been done on it, then it merits a qualitative approach” (Creswell, 2014, p. 18). Detailed, quantitative data gathering typically follows the initial qualitative data collection phase, where themes are established. In terms of collecting data for this specific study, my own experience in teaching sound design and my decision to engage with participants through conversational dialogue and written questions rather than from statistical data gathering also helped influence the data collection instrument design. This subscribes to the view that “individuals who enjoy writing in a literary way or conducting personal interviews or making up close observations may gravitate to the qualitative approach” (Creswell, 2014, p. 19). Speaking with sound designers, teachers and students is at the core of this study and so a qualitative approach that allows them to convey their experience seemed most appropriate to me as I considered various data collection methods and approaches. A conversational approach, both in surveys and interviews was the best way to engage with the participants to encourage them to speak openly about their views.

The principal tools used in the data collection process for this study were online Survey Monkey questionnaires followed by interviews with selected participants. Surveys are a popular tried and tested tool amongst researchers. Fink identifies four types: “self-administered questionnaires; interviews; structured record reviews to collect financial, medical, or school information; and structured observations” (Fink, 2003, p. 25). The data collection may also involve creating a web-based survey and distributing it online: “survey research is probably the best method to use when one hopes to gain a representative picture of the attitudes and characteristics of a large group” (Blackstone,

2012, p. 194). Online surveys are convenient and easy for participants to engage with because the researcher can easily distribute to a large number of potential respondents using email and the data can be easily collated due to the convenience of receiving responses either through a website or through email.

Blackstone states that “although surveying is relatively easy and cost effective, there are several notable disadvantages of using this approach ... the fact that the survey researcher is generally stuck with a single instrument for collecting data (the questionnaire) is, in many ways, rather inflexible” (Blackstone, 2012, p. 195). In acknowledgment of this drawback, and the fact that participants may write comments that require a follow up on my part, I had decided at the outset of the research that the surveys must be partnered with comprehensive interviews where a more engaging situation would lead me to learn more specific details from the selected participants.

Question design

The open-ended design of the questions allowed the participants to elaborate on each of the points raised, which covered: necessary attributes of a sound designer; experience with and perception of creative sound design resources; and opinions on improvements that can be made in both areas.

The survey participants

The goal of this research was to determine if there was a limitation in resources that related to creative sound design techniques and if there was scope to improve the teaching methodologies used in further education to teach sound design. The research used three candidate groups to gather qualitative data on current learning and teaching in recent years: professional sound designers, teachers of sound design and students of sound design.

The professional sound designer group comprised of active sound designers working in film, television or in video game audio. These candidates had experience in the relevant industries in which sound design is applied. They had a working knowledge of the skill sets required for emerging sound designers to succeed in these areas; for example, the ability to work in a team or to work to a brief.

The teacher group comprised of sound design teachers or heads of departments or faculty. They taught sound design within programs in which sound design is a key component, such as audio engineering, film sound, music, or exclusively sound design.

The student group comprised of current or recently graduated students who had participated in a program in which sound design was taught in some capacity. Their experience differed depending on the nature of the core study in which they were enrolled, such as film studies, audio engineering or music. The students questioned were

all in at least their final year of study or beyond and so had experienced a complete program at their college or university.

The interviews

In this research design, the survey tool was accompanied by interviews with participants in order to allow them scope to elaborate further on their views. In this way, the inflexibility of a prescribed survey was balanced against a free flowing conversation. I interviewed several participants who had also taken part in the initial online survey. They were selected based on comments they had written in their survey responses that I felt required further enquiry.

Interviews, as part of a research process, are a commonly used method, but their limitations are also recognised. Atkinson & Silverman draw attention to the “asymmetrical nature of the interview and to the fact that the final product is a pastiche put together by fiat” (Atkinson & Silverman, 1997, p. 304), alluding to perceived unreliability. Scheurich expands on this and observes that the “interviewee is a person, historically and contextually located, carrying unavoidable conscious and unconscious motives, desires, feelings and biases – hardly a neutral tool” (Scheurich, 2006, p. 239). Given the nature of this qualitative approach and the fact that I was looking to measure opinion based on the direct experience of the participants, the potential for bias in opinion could be offset by future study in which quantitative data collection is a focus. Atkinson and Silverman comment that despite the risk of bias, the interview remains a favoured approach for researchers. Both qualitative and quantitative researchers tend to rely on the

interview as the “basic method of data gathering where the purpose is to obtain a rich, in-depth experiential account of an event or an episode in the life of the respondent”, but draw attention to the notion that there is a need to have “faith that the results are trustworthy and accurate and that the relation of the interviewer to the respondent during the interview process has not unduly biased the account” (Atkinson & Silverman, 1997, p. 304).

Interview method

The interviews conducted for this research were carried out online using Skype and, with the interviewees consent, were recorded and transcribed. The questions are outlined in Appendix 1. The method used was that of a semi-structured interview in which the interviewer reacts to the responses from the interviewee. This created a “relaxed semi-formal discussion” (Bernard, 1988, p. 212), in which the interviewees seemed comfortable in elaborating on the earlier comments they had made in their Survey Monkey responses. A useful product of this approach was that interviewees raised other topics within the subjects discussed that led to additional considerations for this research. For example, the learning of unfamiliar software such as a DAW (Digital Audio Workstation) is expedited due to the fact that students may have their own laptops and software, which allows them to work at home and also to access online tutorials that specifically address relevant technical skills.

Selecting participants

Although the criteria for selecting prospective participants has already been described, contacting prospective participants was conducted using the following methods:

To contact *teachers*, I reached out to universities and colleges, nationally and internationally, where I knew sound design to be present in their curriculum. As previously stated, many of these institutions teach sound design as part of a program, usually focused on one of the following; music, film (including film sound) theatre (including theatre sound) and video game development. In each contact, I directed my request for participation to the Head of Department or to the lecturer responsible for delivering units of study incorporating sound design. Contact with *professionals* (sound designers) was made through sound design specific forums; professional networking sites like LinkedIn and through direct contacts made after IMDB research was undertaken (Independent Movie Database). Contact with *students* was made through social media, universities and sound design forums.

Interview selection

The participants I requested to move into the interview stage were selected based on comments made in the surveys. As several of the survey participants were verbose in their responses to several questions, the interviews were an opportunity to explore their views further, as well as other related themes. The participants included representatives from each group and the interviews followed a loose, conversational style in which the following subjects were covered in detail: the skills required to practice as a sound

designer professionally, the experience of teaching or being taught sound design, and a discussion regarding learning resources relating to creative sound design.

The details of the interview participants are as follows:

Teacher An experienced sound design lecturer with notable experience as a film sound designer in Australia. We discussed the teaching methodologies used in his current role as a lecturer at a NSW university. He is an advocate for a teaching process that encourages students to think creatively, and utilises techniques to encourage this early in the course.

Sound Designer An experienced and currently active sound designer with film and television experience based in the US.

Student A recent graduate of the SAE audio engineering program, and now a professional sound designer focusing on video game audio. He is based in Scandinavia.

The survey

The participation rate of respondents represented around (50 %) of those initially contacted to take part. The number of overall participants was relatively small however the qualitative data provided by their survey comments and in some cases, follow up interviews still provided clear consensus on the matters discussed. Individuals that did take part were experienced in their particular area and keen to express themselves.

Data management and coding

Data management for the survey results comprised of maintaining a spreadsheet system in which the answers from the participants was entered. This allowed me to easily overview all participant responses in one document and to recognise themes in responses where they existed. I used a simple colour code method to improve this process.

Interviews were captured and retained using a more complex process. Skype was used to communicate with the interviewees and the video feed was recorded using additional software. The resulting interviews were then transcribed and notable comments identified and marked prior to being used in relevant sections of the work.

Conclusion

Surveys were chosen as the principal research tools as they are an effective way of reaching out to potential participants who, geographically, were not accessible and who operated across different time zones in some cases. The participants engaged well with the questions, several submitting multiple paragraphs per question, which is indicative of their interest in the subject matter.

The follow-up interviews were designed to take participants who had demonstrated a willingness to discuss the questions further, and to provide an additional account of their own personal experiences through informal questioning. The utilisation of technology, such as Survey Monkey and Skype, simplified the process of tracking and recording both the surveys and the interviews.

Chapter 5: Data analysis

This chapter will break down the responses received from participant groups – teachers of sound design (T), students of sound design (S) and professional sound designers (P). The individuals involved participated in an online survey, with a smaller group selected for follow up interviews.

The aim of the research as a whole was to investigate the availability of resources that relate to creative sound design skill development, followed by an analysis of sound design teaching and learning within higher education. The questions asked of the participants across both the survey and the interviews covered themes related to the initial research problem. These being: the availability of relevant resources for students that relate to creative sound design; their opinion of attributes needed to practice as a professional sound designer; and the methodologies used in the teaching of sound design, including the design of programs and how they relate to the teaching of skills and attributes already identified.

My own observation that there is a noticeable lack of resources such as books, journals or websites relating to creative sound design was the catalyst for this research. I explored this further through an analysis of the recommended reading titles that students are guided towards and through direct contact with the research participants. From this, a consensus emerged suggesting that availability of resources is an issue that students and educators recognise.

The teachers group acknowledge this deficiency, one commenting “I don't think there are too many publications out there that really delve into sound design as a whole” (T3, 2015). The majority of the others echoed this thought. In interview, one teacher participant mentioned that with resources “there can never be enough” T1 (2016), and then went on to discuss his preference for demonstrating film clips and practical exercises to students rather than using book references.

It was also my contention that some titles that continue to appear in reading lists are becoming not just dated but are losing relevance. This view was echoed by a teacher: “I must admit I rely a lot on blogs and articles in which sound designers share their secrets with the idea that these direct sources are more relevant than some dated publication” (T3, 2016).

Forums such as Slack, where skilled sound designers and other users proactively critique works and share ideas with each other, are popular; for example, the Slack sound design group has over 7000 answered questions, and was mentioned by both the teacher and student groups. The fact that they are interactive and that students can submit work for critique and learn directly from others is the essence of their popularity. A student participant commented, “I don't use books that much. I'd rather talk to people directly that know more about things than me”. He continued with further insight: “I, for one, visit DesignerSound.org, and participate in forums such as Slack, where a bunch of sound designers hang out together”. He had previously mentioning that the books he came into contact with as a student were “not that memorable” (S1, 2016).

As well as mentioning new media resources such as the previously referenced websites and forums, the discussion about resources allowed several participants to segue into comments around the fact that sound design is probably best learnt from ‘doing’ rather than as a book learning subject. “Practical knowledge trumps most any book learning out there when it comes to sound design. Unlike some departments that can rely on book learning, it's hard to learn how to paint without having a paintbrush.” (T1, 2016). The practical knowledge mentioned by T1 opens another area of discussion: the range of skills and attributes that are required of a sound designer. The intent here was to get an opinion from participants on the skills that are required to practice sound design competently and then examine how those skills are taught within teaching programs, and whether they are covered by available written resources.

As we already explored through the literature review, the creative aspect of sound design involves making design choices that enhance or support an overall creative vision and participants echoed these themes. A sound designer commented that sound design “is responsible for the immersion of the audience in an environment”, and that “imagination and creative thinking is what can make that immersion effective. (P1, 2016). During further discussion, imagination and experimentation emerged as strong themes from each group. “The most important thing is to use your imagination and encourage creative thinking through sound” (P1, 2016).

This participant also commented on the development of creative problem solving skills. “There is a lion and this lion is going to attack a guy on stage, so what could that sound like? Rather than support the action, enhance the action, make it more than it appears to be” (P1, 2016): These comments typified those from the sound designer group that suggested that excellent sound design skills are grounded in a creative vision that is then executed within a deadline, budget or other parameters.

This type of thinking echoes back to the literature discussed earlier, where Chion, Sonnenchein and Labruzzo detailed the creative intent of sound design, reaffirming the idea that sound design is largely about creative problem solving and expression. As well as imagination and creative problem solving skills, a strong theme from all groups related to prospective sound designers needing specific skills and knowledge to function within a creative team. A sound designer needs to be a “Focused, clear communicator” (P4, 2016), have a “good thought processes and problem solving skills”, be an honest, good communicator, hard worker”, and have “the ability to get work done regardless of being tired, pissed, understaffed, undersupplied, overworked, or under skilled” (T4, 2016).

These comments give insight into the pressures involved in a typical professional production environment where deadlines and budgets must be adhered. Flexibility was also a recurring theme that resonated with the professional sound design group in particular; an ability to adapt to differing projects and circumstances and apply critical problem solving skills across a range of scenarios. “You need flexibility so you can adapt to ever changing situations on the stage and the world of audio software” (P3, 2015) was

a theme that recurred several times, with several alluding to aptitude and work ethic as well: “You need the capability to offer sound material in a moment’s notice, usually with a guidance of only a word or two from the director” and “flexibility and having a good attitude, while being good at the job always helps, people will appreciate your work more if you can keep a positive attitude” (T6, 2016).

Detailing the particular skills and attributes that typify a professional sound designer was an important aspect of the research. The next step was to look at how the participant groups felt these skills were being developed within educational programs.

The questions, which encouraged participants to critique current teaching and learning techniques, generated the strongest responses from the professional sound designers and the student groups. Within the responses, they often referred back to the themes that had already been mentioned as skills and attributes required of a sound designer. One of the sound designers provided an overview that reminds us that students need to be motivated and keen to engage to learn effectively: “Good technical foundation with lots of practical work experience are the keys for success in the world of sound design. If those things are offered in the program, it's all in the hands of students” (P3, 2016).

The requirement for education programs to teach creative problem solving skills was a theme reflected across responses from all groups, relating back to the core concept explored through the literature review that storytelling is a fundamental aim of sound design. “Less software teaching and more teaching of the importance of narrative” (P1,

2015) was suggested as a focus from one of the sound designers, while another suggested that “more time needs to be spent on the fundamental theoretical underpinnings of sound design” (P4, 2016).

The theory referred to in this second example was generally described as referring to existing sound designs such as film clips; an understanding of sound design technical and creative fundamentals; and “showing students how to think outside the lines when designing sound” (T1 (2016). Recognising the challenge of delivering theory in class, one of the sound designers suggested, “this must be constantly tied to practical examples to provide context and retain the students' attention” (P5, 2015). This point was reiterated by a student who had found theory to be hard work, and not very effective: “I think for my sound design education, they could have been better at letting us learn ourselves. Quite a bit of curriculum was very slow and theoretical” (S1, 2016), which reinforces the previous comment and relates back to ideas around learning by ‘doing’, even when the content is theory focused.

Following on from this, another related theme that developed across this part of the research was that each group frequently offered their own suggestions for changes to curriculum that might allow students to develop creative and technical skills. For example, “Ways to develop and encourage student autonomy are essential” (T3, 2015) was an insightful thought contributed by a teacher as it echoed closely the views of the sound designer group as a whole. Project work, where students work in groups to develop an idea, emerged as a strong recommendation from all groups. One of the teachers took this idea further and theorised how he could add it to his curriculum: “I think project-

based learning is optimal, with a facilitator acting as creative director. I haven't had the chance to try this yet, but I imagine a large project where students are divided into smaller teams to simulate the interaction/ soft skills required for a project of that size” (T5, 2015). One of the sound designers, P3, reiterated how important these skills are and how they can help student development in his view:

Students should participate in as many productions as possible during their studies. From actual projects with timeframes, students will get some invaluable experience how things and timetables work in the real world, and how they can cope with them. (P3, 2015)

An unexpected theme that emerged was a critique of the teachers themselves, and their suitability: “Where I taught at, the vast majority of teachers were previous students whose greatest claim to fame was mixing at the local bar ... without real world experience ... instructors can only read books, magazines and watch YouTube videos” (T4, 2015). This sentiment relates to a practical need for teachers to have professional experience in order to give context to their teaching, and is in harmony with comments made by the sound designers when discussing the required attributes that a sound designer needs to operate effectively and therefore should be taught within programs.

The teacher group discussed the challenge of adhering to the ideals suggested by this critique. One teacher highlighted the fact that within a limited timeframe it can be difficult to engage with students and to develop their skills, or even to expose them to project work: “How do we create good sound designers? A lot of it comes down to the individual. We’ll start with a lecture and show the theory of sound and then we’ll go into

a lab and work with sound. It takes so long to get past those competencies that there is not a lot of time to get into the design side as much” (T1, 2016).

This point in particular resonates with me as I view my own skills as a sound designer evolving over a period of time and through various projects. At a certain point, my competency with the technical process was enough to allow me to focus much more on the design side and to approach projects with an emphasis on creative development, whereas for a new student entering sound design it is challenging to reach this point.

T1 described the challenges involved in working with students that lack the confidence to take creative risks due to their inexperience, “where they are confident enough to go out and do what they think they should be doing. As far as creating sound or designing new sounds, that may happen in that final third year or they may leave not having done that” (T1, 2016). The consensus across this research suggested that this scenario can be avoided or improved upon if a greater focus on creative skill development is embedded in the teaching and learning program.

This research also sought to determine if the balance of creative skills versus technical skills is considered appropriate. I had noticed in my work as an educator that students found it difficult to look past the technical processes involved in using software and hardware and to look ahead to the creative goal. This observation was reiterated by several participants. Statements like “Students are preoccupied with technical stuff. Bring them more onto a dramatic/creative thinking level” (T1, 2016), and: “People do get

obsessed with the gear they have instead of their own particular talent” (P1, 2016), were insightful, but, on the whole, the balance between teaching technical and creative skills presented itself as less of an issue than I had anticipated at the beginning of this research. A greater focus was on collaborative work, which emerged as a much stronger recommendation for change. An interviewed sound designer summarised the relationship between these two skill groups. “There is a certain amount of technical garbage you just have to learn, but after that the sky is the limit” (P1, 2016).

Chapter 6: Conclusion

This study set about examining the perceived need for, and availability of, resources that student sound designers can utilise to support creative skill development. It also examined methodologies used to teach sound design, including a critique of process and curriculum design, and explored the relationship between creative skill and technical skills relating to sound design. The data collection phase of this project was successful in attracting participants representing the key groups of teachers, students and professional sound designers. Their contributions, including in many cases verbose responses to questions, are demonstrative of a topic that resonates strongly with them.

This study has examined the resources available to sound design students that specifically support the development of their creative skills. The research has indicated that books, in general, lack specific reference to creative techniques and the surrounding theory that students need to create effective sound designs for media. In my own published articles (see Appendix 2), I refer to concepts such as ‘creating more impact’ or ‘utilising contrast to create drama’, and I demonstrated how this is achieved, whereas most books on tertiary education recommended reading lists do not directly discuss nor illustrate creative sound design techniques in this way.

Those books that remain most useful, although some are quite dated, are those that describe sound design concepts and first-hand descriptions of the evolution of ideas, such as Loblutto’s *Sound on Film*. Books of this type are referred to students because they demonstrate the evolution of a practice; for example, how to successfully develop

concepts and apply them in the appropriate context. They also help to give clarity to the filmmaking process and the conventions considered best practice with their personal, descriptive approach to particular creative challenges, and how the sound designer achieves the final design.

Online resources are not plentiful, but they are significant. There are only a few websites that specialise in sound design, and these have an advantage over printed references in that they contain current information relating to the practice of sound design and the processes involved. An excellent example is designingsound.org. Website forums can be a useful resource for the student as they create opportunities to ask questions, share work and access a repository of previous questions and responses. Usefully, due to the small size of the industry, some of the popular forums have the advantage of enabling access to notable sound designers such as Randy Thom and David Sonnenschein, who are not only active forum readers and contributors but also appear in traditional reading lists.

***Sound On Sound* articles**

As examples of written resources that can be used to address the gap identified here, I have submitted as an appendix to this paper, articles that were commissioned by and published in the UK magazine *Sound On Sound*. The intent of these articles was to share with the reader some of the creative sound design methods that I have developed throughout my career as a sound designer in video games and other media. They were published throughout 2013/2014 and served to introduce readers to concepts within

creative sound, such as creating drama through silence, intensifying an impact and the power of contrast. A further breakdown of this content features in Appendix 2.

Moving away from books and online resources, the research has suggested that a better approach for the development of creative skills is to encourage more project-based tasks so that students can develop skills through practice within a creative framework. In this way, the application of theory is developed through the use of sound design examples followed by practical collaboration. The students indicated that theory is better understood when taught together with directly relevant practical sessions. Essentially, the student group advocated for practical learning opportunities, to be delivered across the duration of their program rather than, as is usual in traditional program design, grouped towards the latter stages.

Teacher skills

The lack of sound design resources specifically relating to the development of creative skills results in students who are particularly dependent on the skills of the teacher/lecturer. Several participants in the research mentioned that teachers can possess inconsistent technical skill levels and, perhaps more importantly, little industry experience. They note that learning may be compromised as a result. The participating sound designers also advocated for teachers to lean on their own professional experience where possible, and to introduce industry skills such as teamwork, working to a deadline and collaborating with other creatives such as music composers. This viewpoint resonates with me in my role as a vocational training faculty manager. In my professional

experience, the industry skill levels of trainers/teachers have a fundamental relationship to their effectiveness and their ability to engage students.

Where the availability of high quality creative skills teaching resources is limited, it is difficult for less industry-experienced teachers to produce relevant content. There is a potential need, therefore, for a body of resources that can be referenced by students and teachers alike that goes beyond the creative workshop teaching I have demonstrated in my own *Sound On Sound* articles. This may include videos, online guides and, perhaps, specific forums to discuss creative sound design development.

Access to high quality resources could drive greater consistency within teaching and learning as teachers would not have to reinvent the wheel when they need to design programs or lesson plans around sound design. For example, a high quality video series or series of articles published online could be accessed and referenced as part of the recommended reading lists provided to student. Services that present high quality digital learning resources, such as Pluralsight, are very effective in the teaching of specific subjects, but their sound design portfolio is limited in content and, like the free video sites, this content is largely concerned with the delivery of technical skills.

Teaching model design

Throughout this research we have gauged the opinions of sound designers, teachers and students on the current methodologies used in sound design teaching. The design of teaching models has been discussed in terms of the need to have students collaborate and

develop their team and communication skills ready for industry. The participants overwhelmingly supported the idea that students need to learn their creative skills in parallel with their technical skills, although the point was made by the teacher group that challenges exist in terms of student confidence and the associated unwillingness to take creative risks in the early stages of study.

A response to this is a model in which students participate in projects and group work much earlier in the curriculum, rather than a more conventional model in which students work on projects only in the latter part of the course, once core technical and theory skills and knowledge have been learnt. This, for instance, is a model of a semester-long sound design unit (13 weeks) that could exist within a degree course in music, sound technology or filmmaking:

Weeks 1–3

Theory Students are introduced to sound design, discovering its relationship with visuals within film.

Technical Introduction to DAW and the recording of sounds using portable recorders

Practical Students asked to record edit and create a montage of sound to a given brief

Weeks 4–6

Theory Students research and present their own examples of effective sound design

Technical Editing sound

Practical Project #1: Group work collaborating with animators or film makers on short piece

Weeks 7–9

Theory Sound physics and how to emulate.

Technical Editing and applying effects

Practical Project #2: Group collaborative piece, tight deadline, real world conditions

Weeks 10–13

Theory Mixing and mastering theory, compression.

Technical Mixing and mastering

Practical Individual project, pitch a sound design.

This model features project work earlier within the semester and aligns technical skills and theory alongside creative collaborations, as a way of immediately applying the theory and skills delivery. At least one of the projects featured emulates typical industry conditions where students collaborate with other creatives.

The feeling across the participants was that even if the students lacked the skills to create technically correct or creatively inspiring work, they would benefit from the skills and confidence gained in the collaboration process. If the course of study encourages the students to work on creative projects throughout their course, then these skills can develop in the same way the professional sound designers attest they have through industry. In this way, peer learning within groups reinforces the direct teaching of skills in a classroom. The core tenets of a new teaching model could include:

1. Establish a culture of project driven learning early in the course, which encourages development of collaborative and communication skills.
2. Encourage critical listening to heighten the awareness and knowledge of existing sound designs.
3. Focus class/objectives on achieving creative goals as well as demonstrating technical knowledge.

The learning of technical processes such as understanding a recording chain, implementation of time based effects and dynamic effects, and editing and balancing

could be enhanced by additional involvement in projects that require the application of this knowledge in creatively effective work. In addition, students would benefit from having a larger range of work for their portfolio, given that the industry, like many creative arts industries, is portfolio-centric when it comes to hiring unknown arts workers and creatives.

Self-critique

The design of this research and the scope of the outcomes is open to self-evaluation. The intent of the research tool design and the scale of the research itself was to establish and investigate two main areas of interest. Firstly, the lack of resources relating to creative sound design, and, secondly, the design of programs concerned with sound design.

The surveys and interviews were successful in attracting a cross section of relevant participants, ensuring that the validity of the data throughout the process. The survey questions themselves received reasonably lengthy responses from the majority of participants. Improvements in the question design, however, could have prevented some of the occasional short answers that appeared, where participants answered with only two or three words. The interviews were more successful in this regard, with each of the participants being engaged and willing to share their thoughts and experiences.

Overall, the scope of this research was contained, and focused on the perceived effectiveness of available resources in teaching and learning sound design skills. I sought

out individuals who have experienced this from different perspectives. The project did not encompass actual academic result analysis, observation of differing teaching methods or numbers of students who might have gained employment in related industries.

The academic level of the programs looked at was also not factored in, although many of them tended to be undergraduate programs, with sound design available at diploma level, and postgraduate level in rarer cases. In future, greater detail can be assigned to specificity across diploma, undergraduate and postgraduate awards. Similarly, distinction could be made in relation to the pre-existing skill set of students learning sound design. For example, sound technology students may be more technically adept, whereas music students may be further developed across their creative skills, particularly if they have experience in composing.

Future research

This research project has covered two areas of interest relating to the teaching and learning of sound design. The first is the availability of written resources to support sound design students, specifically in the areas of creative sound design skills. The second is the teaching and learning models used, and whether they support the skills and attributes required of professional sound designers. This qualitative model is intended to be a first step towards determining opinion on sound design pedagogy and teaching/learning resources. As Creswell notes, “If a concept or phenomenon needs to be understood because little research has been done on it, then it merits a qualitative approach” (Creswell, 2014, p. 22). Following on from initial qualitative research, one can then move towards a substantial quantitative study that observes the specific teaching

models used by higher education in relation to sound design teaching and to the specifics of the outcomes achieved by students. A comparison between teaching models that more closely fit the ideal described through this research against more traditional models would be very useful. The results could lead to the development of a curriculum design based on tangible outcome data.

Future research design could scrutinise in more detail across a larger sample size, and address the following areas.

- Design of the teaching programs. The mapping of required skills as identified by this research across a full curriculum and the tangible benefits of a switch to a new structure of learning where, generally, a greater focus on project and collaborative work exists.
- Skillsets of the educators involved in teaching. A shift to more practical learning puts more emphasis on teachers/lecturers to demonstrate creative and technical process.
- Student engagement with content. A study of whether greater collaborative focus leads to more engagement and more skill learning in sound design.
- Case studies of teaching processes in similar art forms. A study of pedagogical process across similar creative arts.
- Outcomes for students across several education providers. Outcomes in terms of job readiness and academic ability.

- Adaptation of teaching methodologies to match new technologies/mediums. The ability of programs to utilise emerging technologies, both in sound design and sound technology, and in education technology.

Further publications

In addition to the articles published in *Sound On Sound* magazine I intend to continue writing and publishing content aimed at students looking to develop their creative sound design skills, and will look to collate these works into a single online resource. This publication would contain reference materials that students can continually access to reinforce skills learnt in class during practical learning sessions, and to enable greater consistency across the teaching of sound design worldwide, as less experienced teachers are able to draw from the resource to bolster their delivery of content. It would also give more experienced sound designers and teachers an opportunity to contribute to useful literature.

Why is this research significant?

This research has shown that the teaching and learning of sound design and the associated resources are areas that can be improved to allow students to more effectively develop collaborative, creative and technical skills. Further study, including a quantitative analysis of academic outcomes, may support the findings here and further strengthen the requirement for improvements in both resource and curriculum design. Improvements in

both areas should see students graduating programs of study with a greater degree of job readiness and a deeper understanding of the field and their place in it.

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Appendices

Appendix 1: Survey questions.

Professional Survey Question:

Have you ever studied sound design in any tertiary course? How did you learn how to do sound design yourself?

When or if you are hiring, what skills and attributes would you look for in a prospective sound design employee?

Do you think that sound design students are graduating from education with the skills and attributes from your previous question already developed?

Within sound design, are there skills and attributes that can't be taught in tertiary education, and that students might be expected to learn on the job? If so what are they?

Sound design is a creative art that requires technical knowledge and creative skill. From your experience of working with graduates of programs that teach sound design, or your own experience of studying sound design do you have any comments on how this subject could be taught more effectively?

Teacher Survey Questions:

What types of skills do you think a sound designer must possess to work effectively in the industry?

Are those skills currently taught in your education program?

Do you think there are enough resources in terms of books, journals and online to provide information to students that want to find out more about sound design, including materials that relate to development of creative skills?

Do you feel the education program you are involved with offers student's exposure to both the **technical** aspects of sound design for example, hardware and software techniques and processes and the **creative** aspect of sound design for example, designing sound to convey a mood within a scene or creating sound to portray a fictional creature or location?

What are your thoughts in general on the ways that the teaching of sound design can be improved?

Student Survey Questions:

What are the skills and knowledge you think graduates need to work effectively as a sound designer in industry?

Do you feel that your education in sound design involved exposure to both the **technical** aspects of sound design for example, hardware and software techniques and processes and the **creative** aspect of sound design for example, designing sound to convey a mood within a scene or creating sound to portray a fictional creature or location?

Of those two aspects, technical and creative, do you feel your course featured a good balance of both or was it biased to one of the two?

At your current skill level, do you feel that you are more adept and experienced at the creative aspect of the sound design process or the technical aspect?

Are there any ways in which your education in sound design could have been improved?

Appendix 2: Sound On Sound Articles

Available online at the following URL's

<http://www.soundonsound.com/sos/oct13/articles/sound-design-pt1.htm>

<http://www-acad.sheridanc.on.ca/~degazio/ANIM20065folder/week06-sfx1/PDFs/sound-design-part-two.pdf>

<http://www.soundonsound.com/sos/aug14/articles/designer-sounds-0814.htm>

Sound Design for visual media & Radio Part 1. Published October 2013

This article covers several sound design techniques including:

Layering for detail and depth:

This technique adds richness and character to sounds, allowing the sound designer to control the content of a particular sound by adding other textures and tones. An explosion sound is created through the tutorial as an example of a single sound that can comprise of multiple elements.

Creating impact:

This section covers techniques around giving sound design more impact, for example with a contact sound, the reader is shown how to embellish the sound before, during and after the 'hit'.

The use of contrast:

Contrast is a powerful tool in sound design, enhancing impact by pulling the listener out of one situation and into the next. It can be used to great effect to add drama or suspense.

The power of silence:

Using silence is a fundamental sound design skill, silence lowers the energy of situation, ready for it to be ramped up again, allowing for contrast.

Editing:

In this section the reader is given tips on the editing process and how to create clean edits across sounds. Using Pro Tools as an example, the different editing tools are detailed.

Sound Design for visual media & Radio Part 2. Published August 2014

This article looks at the process of preparing for and delivering on an entire sound design project and provides to the reader an overview of the processes involved from beginning to end and the relationship between each. In addition, the article also covers more sound design creative skills including the use of perspective, foley and spot effects.

Sound Design for visual media & Radio Part 3. Published August 2014

The third article looks specifically at music editing including the use and choice of music, editing music to picture, and how music editing fits into the workflow of sound design processes. The article looks at the creative considerations to make when editing music and discusses ideas around fitting music around sound effects, atmosphere, dialogue and other sounds that may be present in the mix

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