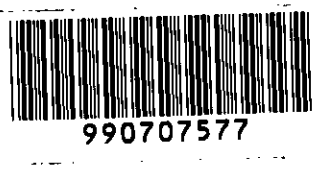

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The Source of Accountants' Knowledge of Activity Based Costing

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Abstract

This paper reports the results of an investigation of the association between accountants', employed in the manufacturing industry, and their knowledge of activity based costing. The motivation for this study was to provide a possible explanation for the perceived gap between management accounting theory and practice identified in previous studies (Dunk, 1989; Scapens, 1994). One hundred and thirty seven accountants employed in the manufacturing industry and who are members of a professional accounting association were surveyed to determine their knowledge of activity based costing. The results indicate that the level of knowledge of activity based costing held by these accountants is associated with their affiliation with a particular accounting body and the source of their on-going professional development. These results are important to professional accounting bodies and organisations generally because they can more effectively allocate training and professional development resources if they are aware of how on-going professional development is associated with accountants' activity based costing knowledge.

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Introduction

A recent Australian study of the education and corporate training of management accountants found that few management accountants were equipped to contribute to strategic decision making (Goodwin and Hodgett, 1991). The researchers tested whether management accountants employed in Australian medium-sized companies were ill-prepared to cope with changing technology due to a lack of education and corporate training. They concluded from their findings that the accounting profession and tertiary institutions must be proactive in providing intensive professional development courses, blending theoretical and practical content.

This paper investigates whether accountants, who are employed in the manufacturing industry, hereafter referred to as industry accountants, are aware of, or familiar with, current product costing methods such as activity based costing. Activity based costing has been proposed as a solution to product costing problems, such as the misallocation of overheads to high volume products and as an aid in cost reduction identification (Cooper, 1990). Kaplan (1986) identified the failure of the management accounting system to provide relevant information for managerial decision making and control. The results of the present study may identify whether the lag between the innovation in manufacturing processes and management accounting practices identified by Kaplan (1986) and Dunk (1989) can be explained by the industry accountants' general lack of

awareness or knowledge of advances in product costing, that is, activity based costing. Armenakis et al (1993) identified several strategies to deal with individuals' resistence to change. One way of improving individuals' acceptance of change is education. Hence, if industry accountants have knowledge of changes in management accounting theory they may be more receptive to adopting innovations in management accounting practice. The study will identify whether professional development and training is associated with industry accountants' familiarity with current product costing methods.

Therefore, the aim of this study is twofold: first, to identify the level of industry accountants' knowledge of activity based costing methods; and second, to examine the relationships between knowledge levels and sources of industry accountants' knowledge of activity based costing.

Hypotheses Development

The hypotheses developed in this study test whether industry accountants' product costing knowledge is associated with their on-going professional development. Professional development may be provided by: the professional accounting bodies, the Australian Society of Certified Practising Accountants - ASCPA, the Institute of Chartered Accountants in Australia - ICAA, and the Chartered Institute of Management Accountants - CIMA; in-house, or other sources.

Source of professional development

In manufacturing firms, on-the-job training has been the predominant method of improving employee skills as it has the advantage of being low cost, requiring minimal time, and providing immediate productivity. However, it may be most beneficial when only basic skills are required (Snell & Dean, 1992). On-the-job experience requires solving problems of a conceptual and practical nature, therefore individuals gaining knowledge on-the-job are more able to apply and understand complex processes (Critten, 1993). The working environment demands that they both maintain and up-date their knowledge and provides the opportunity to apply that knowledge and test their ideas.

The current economic and manufacturing environment dictates the need for broader and more advanced skills which in turn implies a need for more formal and comprehensive training. Up until the late 1980's, the emphasis of curricula policies was on knowledge for knowledge's sake, divorcing content from context (Portwood, 1993). The focus of curricula policies was invariably on continuing professional development, and short courses were of a general nature and rarely directly applied to the actual culture and conditions of the workplace (Portwood, 1993).

With changing economic forces the emphasis has been changed to providing courses with greater relevance to the workplace. Professional qualifications and work-based learning of employees as well as company training programs provide job relevance without being job specific. Learning in the workplace can be for general objectives as well as for specific instrumental, defined goals. Such learning can achieve individual competence and corporate capability (Critten, 1993). External professional development programs are more general and result in a general knowledge of the topics covered as compared with specific knowledge obtained on-the-job. It is therefore likely that changes to industry accountants' level of knowledge will be related to the emphasis placed on the content of the professional development program.

Following this argument, professional development programs provided in-house or by other external sources,[1] contain more specific information on management accounting issues such as activity based costing, while CIMA, ASCPA and ICAA programs mainly address broader and more general issues. Hence, industry accountants acquiring knowledge of activity based costing in the work environment or other sources are more likely to have greater knowledge than industry accountants who gain their knowledge from programs provided by the professional accounting bodies. As in-house and other programs containing specific, as opposed to general, information on management accounting issues, it is formally stated that:

[1] other external sources are sources other than the programs provided in-house or by the professional accounting bodies, such as, post graduate studies, external industry seminars, reading articles.

H_1: *Industry accountants who gain their knowledge of activity based costing from professional development programs provided in-house or other sources have greater knowledge of activity based costing than industry accountants who gain their knowledge from programs provided by the professional accounting bodies.*

Involvement in professional development programs

Employees possess skills, experience and knowledge that have economic value to the firm. Increasing experience and knowledge of employees enhances productivity enabling the firm to recoup its investment in human capital. Profiles of individuals attaining partnership in Big Six firms suggest that the skills necessary for promotion may be acquired through work experience and through formal education (Bhamornsiri & Guinn, 1991; Ferguson & Wines, 1994). The studies identified that accountants need to gain more knowledge in basic economics, marketing, management and information technologies in order to meet future competitive challenges. The results of these studies suggest that accountants who remain too narrowly educated will find it increasingly difficult to compete in the expanding profession. Hence, industry accountants will respond to the market by broadening their knowledge on product costing methods, or they will elect otherwise and risk losing clients and/or employment.

Studies of the interaction of technology and organisations have suggested that firms upgrade employee skills when implementing new technologies (Helfgott, 1988; Kern & Schumann, 1990). Hence, industry accountants should provide an appropriate accounting system in response to changing technology and a competitive environment. When implementing change, Armenakis et al (1993) identifies that the need for change must be recognised and the individuals and the organisation must believe they possess the capacity to change. One strategy for dealing with resistance to change is education (Armenakis et al 1993).

Employing organisations respond to the pressure placed on individuals to build and supplement their knowledge base by providing professional development programs either in-house or providing time release to attend external programs. Therefore, it is likely that industry accountants, recognising the need for on-going professional development and training in product costing methods to cope with the changing manufacturing environment, will attend these programs more frequently than industry accountants who do not perceive a need to update their knowledge and skills. Increased attendance at professional development programs, continually updating knowledge of advances in management accounting, will consequently lead to increased levels of knowledge. This increased knowledge will ensure industry accountants are equipped to contribute in decision making as considered necessary by Goodwin and Hodgett (1991).

The preceding discussion suggests that there is recognised need to update knowledge and hence attend professional development programs more frequently leads to the following proposition:

H_2: *Industry accountants who frequently attend professional development programs have greater knowledge of activity based costing methods than industry accountants who attend professional development programs less frequently.*

Perceived importance of professional development programs.

A recent study (Sheridan, 1992) found that firms hire employees whose personal values fit with the firms' cultural values resulting in higher job satisfaction and retention rates. Sheridan (1992) also argued that new employees who hold the same values as the firm perform better. Therefore, when a firm encourages and promotes the revision of individual's knowledge and skills, employees whose values fit the firm's values place greater importance on on-going professional development. This argument is also applicable to the values held by the professsional accounting bodies and their members. Following this, accountants' attitudes toward, and perceptions of, the importance of professional development programs will be reflected in their level of knowledge or skills.

Psychological filters, related to the individual's personality, values, attitudes, needs and past experience, operate to influence the individual's perception (Umstot, 1984) of the

benefits of professional development programs. If an individual does not forsee benefits derived from professional development, their perceptions may deter positive outcomes. Hence, an individual's perception of professional development programs may result in a self-fulfilling prophesy. An individual who believes that professional development programs are not important is likely to hold negative attitudes about the programs. These negative attitudes are likely to reduce the level of commitment to, and interest in, program activities. This lack of interest and commitment, in all likelihood, means the program participant will acquire little knowledge or skill from the program.

It is predicted that industry accountants who perceive professional development programs to be important for them will gain greater benefit and hence, greater knowledge, than those individuals who believe the programs are not important for them. These individuals will gain greater benefit from attending professional development programs because interest in the program, rather than actual participation, is strongly associated with positive work attitudes (Leana et al, 1992). The hypothesis is formally stated as:

H_3: *Industry accountants who believe professional development programs are important to them possess a higher level of knowledge of activity based costing methods than those who do not believe the programs are important.*

Affiliation with a professional accounting body

Commitment to an organisation refers to the relative strength of the professional's identification with the organisation and acceptance of the organisation's goals. Commitment also refers to the professional's involvement in the organisation, and willingness to exert effort to remain a member (Kalleberg & Reeve, 1992). Fulfilling professional expectations means professional accountants adhere to the standards, values and goals of the professional accounting body they are associated with. If the professional accounting body holds as its norms and values the advancement of its members' knowledge and skill of advances in management accounting, then adhering to professional expectations is related to the accountant maintaining and updating knowledge and skills. Consequently, it may be argued in the present study that the accountant's level of knowledge of activity based costing is associated with their commitment to a particular professional body and the importance or value the professional body places on management accounting. Professional accounting bodies demonstrate the value they place on maintaining and updating knowledge and skills of advances in management accounting by the requirement that practising members undertake continued professional education. Therefore, commitment to a particular professional accounting body may be used as an indication of the accountant's level of knowledge.

If members of the ASCPA or ICAA do not complete the management accounting elective module of their respective professional programs, they may have little further formal educational exposure to management accounting issues subsequent to their undergraduate studies. In contrast, the aim of CIMA is to provide members with sufficient knowledge to ensure they are competent to act as management accountants for entities. This aim indicates the significance of management accounting concepts. The relative emphasis placed on management accounting by each of the accounting bodies, and the commitment of the members to these bodies, leads to the following proposition:

H_4: *Industry accountants who are members of CIMA have a greater level of knowledge of activity based costing than industry accountants who are members of either the ASCPA or the ICAA.*

Method

To test the hypotheses, a specifically developed and pre-tested mailed questionnaire was used to collect data[2]. Activity based costing knowledge is estimated using a two-part instrument. Part A of the instrument is an objective, technical measure requiring specific knowledge to achieve a correct answer. Part B of the questionnaire does not necessarily require specific knowledge to achieve a correct answer, but does require the participant to be familiar with the subject matter.

[2] Copies of the instrument may be obtained by contacting the first named author.

Part A includes multiple choice questions on activity based costing methods. Half the questions require a true or false response and the other half require the selection of the correct answer from a set of alternatives. Part B includes statements about activity based costing. On a Likert type scale ranging from 1 (strongly agree) to 7 (strongly disagree), participants are requested to indicate their feelings about the statements. Participants are given the opportunity to respond with a "do not know" alternative in both Part A or Part B.

To measure each participant's knowledge of activity based costing methods, participant's responses were assessed and graded by the principal author with a possible score of 0 to 7. The grades were then independently checked by the additional authors. Where participants respond with a "do not know" in either Part A or Part B, the value assigned is zero as an indication that participants do not know the answer to the question. The primary method to evaluate the hypotheses is a one-tailed student's *t*-test with a t-critical of 1.645 at a 95 percent confidence level.

Participants

Members of three Australian professional accounting bodies (the Australian Society of Certified Practising Accountants - ASCPA; the Institute of Chartered Accountants in Australia - ICAA; and the Chartered Institute of Management Accountants - CIMA) participated in the study. The professional development policies of the ICAA and the ASCPA policy mandate that members complete 120 and 60 structured hours per triennium respectively. CIMA members are encouraged to attend professional development programs, but attendance is voluntary.

Descriptive Statistics

To test the hypotheses developed in this paper 137 accountants working in the manufacturing industry were selected.[3] Of these accountants, 21.2 percent are members of the ICAA, 40.1 percent are members of the ASCPA and 38.7 percent are members of the CIMA. The overall response rate to the questionnaire was 24 percent. While a follow-up request may have increased the response rate and could also have been used to investigate non-response bias this was not possible as one of the primary objectives of the questionnaire was to preserve participants' anonymity.

The majority of participants (53.3 percent) attend professional development programs monthly to bi-annually, with the professional accounting bodies providing nearly half (46.7 percent) of the major source of on-going professional development. Most accountants (69.8 percent) regard professional development programs as important. The major source of activity based costing knowledge was from journal articles (35.7 percent) and seminars (31.3 percent), while only 10.2 percent said that they had no knowledge of activity based costing.

[3] The sample used in this study represents part of a larger survey in which seven hundred and ten randomly selected members of the three professional accounting bodies, the ASCPA, the ICAA and the CIMA, participated.

Table 1
Descriptive Statistics

	Number	Per cent
Professional membership		
ICAA	29	21.2
ASCPA	55	40.1
CIMA	53	38.7
Total	137	100.0
Professional Development Attendence		
Monthly	20	14.6
Bi-annually	53	38.7
Annually	22	16.1
Rarely	34	24.8
Never	8	5.8
Total	137	100.0
Professional Development Source		
ICAA	9	6.6
ASCPA	36	26.3
CIMA	19	13.9
In-House	25	18.2
Other	40	29.2
None	8	5.8
Total	137	100.0
Professional Development Importance		
1 Little Importance	1	0.7
2	8	5.9
3	10	7.4
4	22	16.2
5	41	30.1
6	37	27.2
7 Very Important	17	12.5
Total	136	100.0
ABC Source		
Undergraduate studies	4	2.9
Postgraduate studies	8	5.8
Seminars	43	31.4
Journal articles	49	35.8
On-the-job	19	13.9
No Knowledge	14	10.2
	137	100.0

Table 2 contains a Pearson Product-Moment correlation matrix for the variables tested in the hypotheses.

Table 2
Pearson Product-Moment Correlation Matrix (N = 128)

	Objective	Subjective	PDPlace	PDTime	PD Import	Prof Body
OBJECTIVE	1.00					
SUBJECTIVE	0.454**	1.00				
PDPLACE	0.170*	0.120	1.00			
PDTIME	0.106	0.039	0.212**	1.00		
PD IMPORTANCE	-0.012	0.072*	0.169*	0.381**	1.00	
PROF BODY	0.211**	0.186**	0.243**	-0.118	-0.004	1.00

Significant levels: *p<0.10, **p<0.05

Results and Discussion

The results from investigating the first objective of this study, that is, to identify the level of accountants' knowledge of activity based costing methods, reported in Table 3 show that, on average, accountants employed in the manufacturing industry are knowledgeable about activity based costing with a mean score of 4.25 and 4.56 for the objective and subjective measure respectively. Further tests were performed to test the hypotheses of association between the industry accountants level of knowledge and their professional development and membership of a professional accounting association.

The results for H_1 reported in Table 3 show that, for both the objective and subjective measures of activity based costing knowledge participants who gained their knowledge from professional development programs provided in-house and other sources have greater knowledge than participants who gained their knowledge from programs provided by the professional accounting bodies. However, this result was only significant for the objective measure of activity based costing knowledge. These results partly support Hypothesis 1, however caution must be exercised when interpreting the subjective measure as it is measuring a participants opinion and, as such, may not be a reliable measure of their level of knowledge. Hence, it is suggested that the results are sufficient to support the hypothesis.

Table 3
Activity Based Costing Knowledge

Independent Variable		Dependent Variable Activity Based Costing Knowledge					
		Objective measure			Subjective measure		
		Mean	**Std Dev**		**Mean**	**Std Dev**	
TOTAL RESPONDENTS	n=137	4.25	1.74		4.56	1.54	
		Mean	**Std Dev**	**t**	**Mean**	**Std Dev**	**t**
PD SOURCE							
Acc Bodies	n=64	3.96	1.73		4.40	1.68	
In-house	n=65	4.58	1.71	2.10*	4.75	1.36	1.34
PD TIME							
frequent	n=73	4.42	1.73	4.66	1.41		
infrequent	n=64	4.05	1.74	1.27	4.45	1.69	0.77
PD IMPORTANCE							
important	n=95	4.21	1.76		4.66	1.36	
not-important	n=41	4.32	1.73	-0.33	4.29	1.78	1.29
PROF BODY							
CIMA	n=53	4.66	1.52		4.90	1.02	
ASCPA & ICAA	n=84	3.99	1.83	2.24*	4.35	1.77	2.10*

Significant levels: **p<0.05

The results reported in Table 3 do not confirm Hypothesis 2. They show that, for both the objective and subjective measure of activity based costing knowledge, participants who attend professional development programs monthly or bi-annually (frequently) have greater mean scores than participants who attend professional development programs annually, rarely or never (infrequently) but there is no significant difference in these results. However, these results may be confounding two issues, namely frequency of attendance and attendance at professional development programs. That is, frequency of attendance is inextricably linked with actual attendance. This confusion may be considered a limitation of the paper. However, closer inspection of the responses shows that those participants that indicated that they did not attend these programs did not indicate any source of professional development.

Hypothesis 3 is tested by determining whether participants who believe professional development programs are important for them (rating the importance five, six or seven on a Likert style point scale) have greater knowledge of activity based costing than participants who believe professional development programs are not important (rating the importance one, two, three or four). The results for H_3 reported in Table 3 do not support the hypothesis. For both the objective and the subjective measures of knowledge of activity based costing, industry accountants who believe professional development programs are important for them do not have a significantly greater mean score than industry accountants who believe professional development programs are not important for them.

The results for H_4 reported in Table 3 show that, for both the objective and the subjective measures of knowledge of activity based costing methods, CIMA members, employed in the manufacturing industry have significantly greater knowledge of activity based costing than ASCPA and ICAA members employed in the manufacturing industry. Therefore, hypothesis 4 is supported and it may be inferred that the level of accountants knowledge of activity based costing may be explained by their membership to a particular accounting body.

Conclusions

The results of the study show that, while overall, industry accountants are knowledgeable about activity based costing, some are more knowledgeable than others. Accountants, working in the manufacturing industry, whether as cost accountants or as financial accountants, should have knowledge of ABC for inventory valuation and decision making and to demonstate they are apprised with current management concepts. The study found the extent to which accountants are knowledgeable about activity based costing varies with their membership of a professional accounting body and the source of their professional development. In contrast, the results also show that the perceived importance of, or frequency of attendance at, professional development programs was not associated with the accountant's knowledge of activity based costing.

CIMA members, employed in the manufacturing industry, are more knowledgeable about activity based costing than ASCPA and ICAA members employed in the manufacturing industry. However, this finding is hardly surprising as qualification as a CIMA member requires a knowledge and an understanding of management accounting. What this finding does illustrate is that if the ICAA or ASCPA require their members to have knowledge of current management accounting concepts such as activity based costing, then they may need to encourage members to attend seminars on activity based costing containing a more specific, rather than a general, approach to the content. Industry accountants who attend professional development programs in-house or from other sources are more knowledgeable about activity based costing than those attending professional development programs provided by the professional accounting bodies. The results suggests that programs and training provided by the accounting bodies need to adopt a more specific approach to content.

The results of this study are insufficient to develop a causal link between a perceived gap in management accounting practice and theory. That is, the lag between the innovation in manufacturing processes and management accounting practices identified by Kaplan (1986) and Dunk (1989) cannot be explained by the

industry accountants' general lack of awareness or knowledge of a activity based costing. However, the results do provide information that will assist in the design and content of professional development programs and training. Information about accountants' knowledge of activity based costing will assist those who provide professional development and training to determine the appropriate nature and scope of programs that will add to accountants' knowledge. Consequently, the accounting profession, employers and educational institutions are likely to be able to more efficiently and effectively deliver professional development programs that cater to the needs of accountants wishing to develop and extend their knowledge of activity based costing. Hence, the study should assist organisations in recouping their investment in professional development and training through higher productivity.

As with all similar research, this study is subject to limitations. Generalisations about all accountants employed in the manufacturing industry may not be valid from the sample and the results may only relate to the industry accountants that participated in this study. How the participant defines the importance of professional development programs will affect the results for the measures of knowledge. Participants may achieve high scores but believe professional development programs are not very important to them because they are achieving specific work tasks. If participants are achieving specific work tasks they will not perceive professional development programs as a means of updating their present level of skills and knowledge. Hence, how the participants interpret the importance of professional development programs to them should be investigated further.

Limitations of the study, together with the general findings, suggest areas for further research. In future studies, when investigating participants' involvement in, and perception of, professional development programs, the specific nature of the professional development activities should be studied as well. Knowing the nature of the program topic (for example, whether it was taxation, financial reporting, management accounting, business management etc.) would assist in establishing a possible cause and effect relationship between knowledge and specific professional development programs.

The results of this study suggest that the professional accounting bodies' mandatory professional development policy, its members attitude towards professional development programs and the outcome of attending the programs, should be considered. Therefore, a potential area of further research is the investigation of accountants' attitude to professional development programs and the subsequent effect on their work tasks.

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