



Perceptions of preparers and users to accounting change: a case study in an Australian university

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Abstract

Purpose – To examine the likelihood of successfully implementing activity-based costing (ABC) in a university setting.

Design/methodology/approach – A case-based method is adopted, through the survey of participants in one ABC implementation.

Findings – A positive association was identified between successful implementation and the involvement and support of senior management, though perceptions were found to vary according to the precise role of participants in the implementation process.

Research limitations/implications – The data relate to a single Australian university, so that the findings are not necessarily generalisable elsewhere.

Practical implications – The alignment of the ABC system with the university's competitive strategy, continuous improvement programs and organisational culture, is important to a successful implementation.

Originality/value – The study compares the perceptions of users and preparers to the implementation process and identifies significant differences between the two groups.

Keywords Activity based costs, Accounting, Australia, Universities, Change management

Paper type Research paper

Introduction

The efficiency with which traditional cost and management accounting practices can cope with the requirements of technological change have been of major concern in the cost and management accounting literature for a number of years. A number of authors (Cooper and Kaplan, 1991) argue that the information provided by traditional management accounting techniques is neither timely, nor accurate enough, to cope with the requirements of modern managerial needs. This perceived gap has been a major impetus for management accounting innovation (Chenhall, 2003; Gurd *et al.*, 2002; Smith, 2000; Lukka and Shields, 1999), so that the literature has witnessed a number of studies exploring the factors influencing the diffusion of cost and management accounting innovations (Anderson and Young, 1999; Chenhall and Langfield-Smith, 1998).

Shields (1995) reports the growing interest over two decades of firms seeking to adopt activity-based costing (ABC) systems, as more realistic methods of allocating operating costs to various cost objects. ABC systems are sophisticated enough to measure the different levels of resources required to produce different products (Sohal and Chung, 1998; Ruhl and Hartman, 1998) and to help the organisation gain an understanding of the cost structures of its products and services from a process perspective (Landry *et al.*, 1997). Greeson and Kocakulah (1997) note that this process



can facilitate the efficient outsourcing of both products and services; Edds and Nielsen (2000) anticipate a major, though not necessarily immediate, cultural impact on the organisation through ABC implementation.

The role of management accounting in universities has been readdressed in recent years, with recognition of a need for effective cost accounting systems to assure informed decisions and better allocation of resources (Goddard and Ooi, 1998). As financial constraints for universities have become tighter, there is now a perceived need to demonstrate cost recovery and profit (or loss) on all courses in order to better manage corporate resources. Survey results (Cropper and Cook, 2000) indicate that the number of educational institutions who are not satisfied with their costing system, and who are looking to alter them in some way, is increasing, and these provide a motivation for this study.

This study concerns a major Australian university, which in 2004, initiated a project to implement an ABC model, to address future challenges and ensure the maintenance of its leading position in the university market. The research examines the significance of the correlation between certain influencing factors and the likelihood of successful ABC implementation in a university setting.

The conceptual framework of this research suggests a relationship between the preparers' and users' perception of the likelihood of ABC implementation success (dependent factor) and their perceptions of implementation variables describing behavioural characteristics of the ABC system (independent factors). These independent variables have been identified by the previous literature as factors associated with successful ABC implementation; similar variables have been reported to be influential in the successful implementation of other accounting changes, for example, total quality management (TQM) (Smith, 2005, p. 178) and the balanced scorecard (Lewy and du Mee, 1998). We follow McGowan and Klammer (1997) in speculating that users' and preparers' perceptions may affect their behaviours and consequently affect the success of the implementation. The major influencing factors suggested by the literature are: top management involvement and support (Shields, 1995; Krumwiede, 1998); linkage to competitive strategies and continuous improvement programs (Anderson *et al.*, 2002; Gurd *et al.*, 2002); linkage to performance evaluation and compensation (Shields, 1995; Shanahan, 1995); training (Young, 1997); ownership by non-accountants (Shields and McEwen, 1996); adequate resources (Krumwiede, 1998); consensus and clarity of the ABC objectives (Sohal and Chung, 1998); timing (Thorne and Gurd, 1995); the organisation culture (Roberts and Silvester, 1996); the ABC project team (Anderson *et al.*, 2002) and on-going feedback (Thorne and Gurd, 1995).

The study is expected to have both practical and theoretical significance. The study will benefit current and future university implementers of ABC by identifying the key success factors in the implementation process, and provide confirmatory evidence, from a university environment, of the results of previous research. In addition, we seek to test the influence of four implementation variables (i.e. organisational culture, project team, feedback and timing) not previously subject to empirical test. The study also extends previous models by investigating the differences between users and preparers in how they perceive the independent and dependent variables.

The remainder of the paper has five sections. The following section will review the relevant literature and describe the research framework of the study; the third section

discusses the research method, and the fourth presents the study's results and analysis. The paper concludes with a summary of the findings, limitations, and suggestions for further research.

Literature review and research framework

Several studies have addressed various aspects of ABC implementation systems, providing insights into the use of ABC in manufacturing organisations (Sohal and Chung, 1998); in the service sector (Norris, 2002; Ruhl and Hartman, 1998); to examine the significance of alternative factors on the organisation's decision to implement ABC (Krumwiede, 1998), and to examine the impact of ABC implementation on the organisation (Landry *et al.*, 1997; Greeson and Kocakulah, 1997; Sohal and Chung, 1998; Edds and Nielsen, 2000).

The focus of this review is on issues discussed by previous studies relevant to this research. The previous literature is divided into four streams: implementing ABC in universities; the theoretical model of variables associated with ABC success; factors critical to ABC implementation success, and perceptions of users and/or preparers of the system.

Implementing ABC in universities

Most Australian universities are, or have been, in a similar position regarding their current traditional cost allocation systems and the need to adopt more relevant costing systems (Goddard and Ooi, 1998; Cropper and Cook, 2000). Despite the perceived need to improve their current costing systems, for numerous reasons, the majority of universities still decline to adopt costing systems that are more relevant to their current needs and which will respond better to the pressures they experience (Cropper and Cook, 2000; Mitchell, 1996). The low levels of ABC implementation in Australian universities mirror that in all organisations worldwide. For example, survey evidence from Innes and Mitchell (1995) in UK, and Chenhall and Langfield-Smith (1998) in Australia, indicates adoption rates for ABC of below 14 per cent; Ness and Cucuzza (1995), in the USA, report fewer than 10 per cent of ABC adopters continuing to support the innovation. Levels of ABC implementation in Australian universities might be expected to increase once the quality of the data improves (e.g. through the inclusion of workload models) and the outputs have clear benefits (e.g. for product costing) compared to existing methods. These outputs might then provide more reliable inputs into enterprise resource planning systems and customer profitability analysis.

The theoretical model

This study follows both Shields (1995) and McGowan and Klammer (1997) in regarding the likelihood of ABC success as dependent on how it addresses key independent behavioural and organisational implementation factors. It hypothesizes the existence of positive correlations between each dependent variable and the independent variables of the study. The study makes a further contribution by examining the relationship between the dependent variable of the study and the four independent implementation variables not previously subject to empirical test (i.e. organisational culture, project team, feedback and timing).

This study will use the concept of users' and preparers' perceptions of the likelihood that the ABC system will succeed as the dependent variable of its theoretical framework.

Concepts similar to this “employee perception of success likelihood” concept have been used in previous studies, for example: user satisfaction (McKeen *et al.*, 1994; McGowan and Klammer, 1997), ABC success (Shields, 1995), the employees’ perception of, and attitude towards the system (McGowan, 1998). Shields (1995) argues that neither the prior literature nor discussions with ABC experts, have provided a consensus on a clear definition of success. This research, therefore, adopts Shields’ approach, in that the dependent variable will present the employees’ perception of likelihood of a successful ABC implementation, achieved in accordance with their subjective participant perceptions regarding the definition of success.

About 11 implementation characteristics have been identified, from the literature, as the independent variables of this study. These variables have been addressed separately in different papers (notably in Shields, 1995; Shanahan, 1995; Thorne and Gurd, 1995; Roberts and Silvester, 1996; Shields and McEwen, 1996; Young, 1997; Krumwiede, 1998; Sohal and Chung, 1998; Anderson *et al.*, 2002; Norris, 2002), but this research is the first to integrate them in a single study, and to apply them to a university setting. The focus here is on behavioural implementation variables, rather than technical implementation factors, since previous studies (notably Mitchell, 1996; Cropper and Cook, 2000) have found technical reasons (e.g. technical defects and the disability of the system) to be unimportant explanations of why most universities have so far failed to consider, or rejected ABC. While technical variables can play their role in increasing the success of the implementation, they only do so if they support the behavioural factors and if they are used in conjunction with behavioural factors. The majority of attention must, therefore, be paid to an understanding of the human side of the organisational change, which will apply to ABC as much as it does to any other type of management innovation. Young (1997) emphasises that to be successful, management and employees have to alter the way they perform their jobs so as to conform to the principles of the new ABC system.

Factors critical to ABC implementation success

Previous literature has identified the following 11 variables that are critical to the success of ABC implementation projects.

Top management involvement and support. Top management support of the ABC implementation project is independently and significantly associated with ABC success (Krumwiede, 1998; Shields, 1995; Shields and McEwen, 1996; McGowan and Klammer, 1997). ABC success in different organisations is related to top management’s level of education, understanding, communication, involvement, experience and commitment to the ABC project at all stages (Sohal and Chung, 1998; Norris, 2002). ABC implementation needs strong commitment from top management to provide sufficient resources and motivation for the project in all its phases. This involvement will convince employees about the seriousness with which the project is regarded, and help to secure wider employee involvement.

Linkage to competitive strategies and continuous improvement programs. Linkage of ABC to competitive strategies and continuous improvement initiatives such as TQM and just-in-time (JIT) production systems are other factors significantly associated with ABC implementation success (Shields, 1995; Shields and McEwen, 1996; Gurd *et al.*, 2002).

Shields (1995) and Young (1997) emphasise the importance of an ABC system operating within an organisation in which members of the organisation are disciplined

to strategies of competition and improvement. Thorne and Gurd (1995) noted that ABC is especially fertile when it backs the organisation's competitive ambitions, so that the ABC initiative and the organisation's ambitions reinforce each other. Further, ABC implementation is more likely to succeed in organisations with high competition levels (Thorne and Gurd, 1995; Anderson *et al.*, 2002).

Linkage to performance evaluation and compensation. Linkage to performance evaluation and compensation is a significant determinant of ABC implementation success (Shields, 1995). When employees believe that the resulting system will be used to evaluate their performance and to determine their compensation, they will then be motivated to help the system succeed (Shields, 1995; Shanahan, 1995; Shields and McEwen, 1996; Roberts and Silvester, 1996). ABC implementation should include performance measures not only to help to maintain project enthusiasm, but also to help managers in their pursuit of continuous improvement (Thorne and Gurd, 1995; Gurd *et al.*, 2002).

Resources and organisational culture. Training provided to all employees in the organisation concerning the design and implementation of ABC systems, to help them understand its complexity and impact on the organisation, is an important factor that is significantly associated with ABC success (Shields, 1995; Young, 1997; Krumwiede, 1998; Sohal and Chung, 1998; Anderson *et al.*, 2002). Without a clear understanding of why and how ABC works, employees are likely to ignore or misunderstand it (Shanahan, 1995; Shields and McEwen, 1996). Further, training can influence the achievement of other critical implementation factors. It educates the organisation in how and why to achieve the linkage of ABC to competitive strategies, continuous improvement programs, and performance evaluation and compensation. Training also helps to increase non-accounting ownership (Shields and McEwen, 1996).

The belief by non-accountants that ABC is of practical use throughout the organisation is significantly associated with ABC success (Shields, 1995; Shields and McEwen, 1996; Krumwiede, 1998). Resources adequate to the project's needs are vital to the system success (Shields, 1995; Shields and McEwen, 1996; Sohal and Chung, 1998). Internal resources, in particular time and personnel, are considered to be of the greatest significance (Shields, 1995; Shields and McEwen, 1996; Sohal and Chung, 1998; Krumwiede, 1998).

Consensus regarding clarity of objectives and purposes in the implementation of ABC is important determinants of its success (Shields and McEwen, 1996). Clarity of objectives helps system participants' understanding (Shanahan, 1995; Young, 1997; Sohal and Chung, 1998), and increases their enthusiasm towards the project and its objectives (Thorne and Gurd, 1995; Roberts and Silvester, 1996; Young, 1997). Thorne and Gurd (1995) and Young (1997) emphasise that determination of the right time to initiate the system, as well as the right time to shift from the old costing system to the new ABC system, are critical timing issues that lead to the successful implementation of an ABC project.

To get the best results for the system implementation process, the organisation should have a culture that embraces change and helps ABC implementation to succeed (Shanahan, 1995; Roberts and Silvester, 1996; Young, 1997). Open organisations that are committed to continuous improvement and to achieve worldwide class competition and those whose ABC project is a part of a wider organisational change program are organisations that have the appropriate culture for the implementation success

(Thorne and Gurd, 1995). A project team with broad representation, good communication and analytical skills, and with a good understanding of production and support functions in the organisation, will facilitate successful implementation (Thorne and Gurd, 1995; Sohal and Chung, 1998; Anderson *et al.*, 2002).

Sohal and Chung (1998) suggest that on-going two-directional feedback between top management and lower level employees on the progress of the ABC implementation project is a key ingredient for successful ABC implementation. The timing of implementation, the suitability of the university's culture, the ABC project team and on-going feedback have been identified as independent variables in previous studies, without being empirically examined as success factors.

The first four hypotheses, below, are designed to test the explanatory power of each of these factors:

- H1.* Users' and preparers' perception of ABC implementation success is positively correlated with their perception of the implementation timing issues.
- H2.* Users' and preparers' perception of ABC implementation success is positively correlated with their perception of the suitability of the university's culture to adopt such a project.
- H3.* Users' and preparers' perception of ABC implementation success is positively correlated with their perception of the ABC project team.
- H4.* Users' and preparers' perception of ABC implementation success is positively correlated with their perception of on-going feedback.

It is reasonable to anticipate that likelihood of ABC success will be increased when behavioural implementation variables are integrated and used as a part of the overall implementation strategy. When used together, these variables will provide a powerful indicator to employees that the ABC project is important, to themselves as well as to the firms' success. Shields (1995) suggests that this will increase employee acceptance and reduce their overt resistance to the ABC project.

H5 and *H6* are designed to test whether there is a positive correlation between users'/preparers' perceptions of the dependent variable and their perceptions of the behavioural independent variables:

- H5.* There is a positive significant correlation between users' perceptions of the dependent variable and their perceptions of the independent variables.
- H6.* There is a positive significant correlation between preparers' perceptions of the dependent variable and their perceptions of the independent variables.

Perceptions of users and/or preparers of the system

Shields (1995) measures ABC success by investigating the "overall" degree of success the system has through the perception of respondents of different roles in ABC implementation projects in 143 firms. He also examines respondents' perceptions of several system characteristic variables to determine their association with ABC success.

McGowan and Klammer (1997) examine employees' perceptions concerning the success of ABC implementation and their perceptions of behavioural, technical and

situational variables relevant to the system implementation. McGowan (1998) explores ABC users' and preparers' perceptions of the impact of ABC adoption and their perceptions of several behavioural and technical benefits of the ABC implementation.

McKeen *et al.* (1994) investigate the relationship between user participation in the system development and user satisfaction with the system through the analysis of users' perceptions of variables relevant to the investigated relationship. An examination of the difference between the two subgroups, the preparers and the users in regard to how each subgroup perceive the dependent variable and their perceptions of the independent variables, is an important contribution of this study. *H7* is designed to test this difference. The hypothesis is stated non-directionally because it is unclear from the literature what impact positive or negative differences in perception might have on ABC success. Should this research suggest the existence of a significant difference, further research will be necessary to investigate and develop a directional hypothesis on the difference between the preparers and users subgroups (Cavana *et al.*, 2001):

- H7.* There is a difference between users and preparers in their perceptions of the dependent and independent variables.

Research method

The sample

Testing the above hypotheses concerning the correlates of users' and preparers' perceptions of the dependent variable and the 11 independent variables required the selection of a sample of preparers and users involved in the ABC project central to this study.

The primary targets from which the sample was selected were the ABC project leaders and project managers (the preparers) and the project end-users in the schools and centres (the users). All persons on the ABC Project Management Group and the ABC Steering Committee were included in the sample as preparers (26 in all); only the directors of the centres and heads of schools were included in the sample and were asked to participate as users (20 in all). This sampling method was thus not random, but viewed by the researchers as the best sampling method for obtaining the required information; those selected were the preparers and users of ABC in the organisation who were in the best position to provide the information required.

The sample thus comprised 46 persons involved in the implementation process of the ABC project, all of whom were asked to participate in the study. Only those directors of centres and heads of schools without a role in the ABC Project Management Group and ABC Steering Committee were included in the "user" sample, to ensure differentiation.

Data collection

The data were collected during the months of June and July 2004 via the administration of a personal questionnaire mailed to each of the study's participants. A mail questionnaire was chosen because the study covered individuals based on several campuses, together with interstate consultants. The mail questionnaire made it more convenient for participants of the study to respond, since they could complete the questionnaire at their own convenience. Low return rates and non-response bias are typical weaknesses of mail surveys, so techniques to improve the rate of response were

adopted: a participant information letter with a brief explanation of the study with a description of how to complete the questionnaire was included; the questionnaire was brief and clear; self-addressed stamped return envelopes were provided; as an incentive for participants to respond, a stamped card was provided, to be sent by the respondents separately if they wished to receive a summary of the aggregated survey results, whilst maintaining participant anonymity. In the first two weeks, after the questionnaire was mailed (7 June 2004) 21 responses were received from the potential 46 respondents included in the projected sample (i.e. 46 per cent). To encourage more responses, a reminder letter, attached with the first letter and the questionnaire paper, was re-mailed to potential participants. As a result by the end of July 2004 a further 17 responses were elicited, making 38 respondents in total (i.e. an 83 per cent response rate).

Questionnaire design and the measurement of variables

Consistent with prior research on ABC implementation, the questionnaire used in this study was designed as a simple and direct approach to measure the dependent and independent variables of the study (McGowan and Klammer, 1997; Shields, 1995). Each independent variable and the dependent variable were measured through the research participants' evaluation of a single statement. This single measurement approach might be viewed as a less reliable means than a multiple measurement approach, but as Shields (1995) suggests, the lack of established measures of the studied variables and the exploratory nature of such studies justify the use of a single measurement approach.

The subjective nature of the variables measured largely determines the nature of the survey questions, with language used appropriate to respondents' attitudes, feelings and perceptions. Short questions and guidelines were adopted to minimise both bias and completion time. Each question measured one variable so that the study's variables were carefully considered and adequately measured and no superfluous questions were asked. Closed-questions were used throughout the questionnaire, with users and preparers being asked to rate their perceptions of each of the single statements used to measure the study variables on interval scales ranging from 0 to 5, or labelled "Do not know", "Strongly Disagree", "Disagree", "Neutral", "Agree", "Strongly Agree". Closed questions helped the researchers to categorise the data qualitatively and then to distinguish and to code the answers easily for the sake of subsequent analysis. The alternative categorised answers attached to each question were carefully set to assure that responses were mutually exclusive and collectively exhaustive.

Analysis and discussion

Describing the data

Responses to the study's questionnaire were received from 38 individuals in total. The responses consisted of 23 responses from preparer participants (out of a possible 26) and 15 responses from user participants (out of 20). Response rates were thus 88.5 per cent for preparers and 75 per cent for users. A comparison of the responses from the 21 initial responses (11 preparers and 10 users) with those from the 17 received after the reminder letter (ten preparers and seven users), suggested that non-response bias was not an issue in this study.

Descriptive measures are presented in Table I for all user and preparer participants. Mean values in general varied little from the “neutral” (3.00) position with the exception of the extremes: strategy 4.00; team 3.92 (agree) and culture 2.88 (disagree).

Table II shows a Spearman correlation matrix for all variables with regard to responses from all participants (i.e. both users and preparers). There are significant degrees of correlation between pairs of independent variables (e.g. Topmngmt with Training, Resource and Culture) suggesting that multicollinearity in the dataset may be enough of a problem to preclude the entry of all variables in a multivariate regression equation. Collinearity diagnostic measures subsequently confirm these suspicions, with VIF statistics in excess of ten for both ownership and training. Correlations with the dependent variable (Success) showed highly significant bivariate relationships with Topmngmt ($\rho = 0.510, p = 0.001$), Strategy ($\rho = 0.447, p = 0.006$), Ownership ($\rho = 0.430, p = 0.006$) and Culture ($\rho = 0.312, p = 0.044$).

Hypotheses testing

The Spearman correlation coefficients of Table II, together with the separate correlation measures for the “preparer” and “user” groups in Table III, were used to test hypotheses *H1-H6*. A *t*-test of the two participant groups’ means difference, together with the Spearman correlations were used to test *H7*.

The Spearman correlation coefficients of Table II confirm the positive association between the dependent variable Success and each of the independent variables Topmngmt, Strategy, Ownership and Culture, and to a lesser extent Training ($\rho = 0.301, p = 0.057$). These results confirm those of previous research with respect to the importance of Topmngmt, Strategy, Training, and Ownership, and also support our *H2* with regard to Culture. *H1, H3* and *H4* with regard to, respectively, Timing, Team and Feedback were not supported.

Spearman correlation matrices were generated separately for each of the “user” and “preparer” groups. The coefficients, together with levels of significance, for relationships between Success and each of the independent variables are reported in Table III. Significant relationships are apparent for Topmngmt, Culture and Feedback

Variable	Actual range	Mean	Standard deviation
<i>Dependent variable</i>			
Success	2-5	3.73	0.76
<i>Independent variables</i>			
Topmngmt	2-5	3.86	0.86
Strategy	1-5	4.00	0.87
Evaluat	1-4	2.22	0.93
Training	1-5	3.12	1.04
Ownership	1-5	3.16	1.19
Resource	1-4	3.23	0.97
Clarity	1-5	3.53	1.13
Timing	1-5	3.09	1.06
Culture	1-5	2.89	1.28
Team	1-5	3.92	0.89
Feedback	1-5	3.44	1.05

Table I.
Descriptive statistics for
all participants

Notes: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree

	Success	Topmt	Strat	Evaluat	Traing	Owner	Rsourc	Clarity	Timing	Culture	Team	Feedbk
Success	1.000											
Topmngmt	0.510**	1.000										
Strategy	0.447**	0.157	1.000									
Evaluat	0.136	0.125	0.151	1.000								
Training	0.301	0.452**	0.261	-0.026	1.000							
Ownership	0.430**	0.378*	0.389*	0.113	0.459**	1.000						
Resource	0.212	0.467*	0.001	0.294	-0.037	0.277	1.000					
Clarity	0.115	0.146	0.301*	-0.001	0.451**	0.439**	0.037	1.000				
Timing	0.184	0.307*	0.307*	0.196	0.355*	0.332*	0.143	0.406**	1.000			
Culture	0.312*	0.406**	0.272	0.289	0.073	0.159	0.171	0.081	0.341*	1.000		
Team	0.064	0.074	-0.093	-0.025	0.440*	0.182	-0.370	0.241	0.452*	-0.292	1.000	
Feedback	0.041	0.088	-0.011	-0.186	0.393*	0.226	-0.363	0.027	0.454**	-0.120	0.496**	1.000

Notes: *Correlation is significant at the 0.05 level (1-tailed); **correlation is significant at the 0.01 level (1-tailed)

Table II.
Spearman correlation
coefficient matrix (all
participants)

Table III.
Users and preparers:
differences in success
factors

	User group		Preparer group	
	Spearman's ρ	Significance (p)	Spearman's ρ	Significance (p)
Topmngmt	0.533	0.056	0.312	0.073
Strategy	0.384	0.384	0.357	0.047
Evaluat	0.413	0.143	0.050	0.424
Training	-0.310	0.228	0.298	0.095
Ownership	0.337	0.170	0.301	0.081
Resource	0.648	0.118	0.037	0.448
Clarity	-0.103	0.396	-0.166	0.230
Timing	0.145	0.366	0.024	0.459
Culture	0.831	0.005	-0.112	0.306
Team	-0.237	0.305	0.144	0.284
Feedback	-0.693	0.019	0.396	0.031

(for the “user” group) and for Strategy and Feedback (for the “preparer” group). The significance of the Feedback variable for both groups is surprising, given the results of Table II, and necessitate a reappraisal of *H4*. Although the relationship for Feedback is highly significant for each group, they are of opposite signs: while “preparers” view ongoing feedback of the progress of the ABC implementation as vital to its success, the “users” apparently do not share this view. This conflicting directionality does not support the findings of Sohal and Chung (1998), and neither does it provide consistent support for *H4*.

Table III provides only limited evidence of positive significant correlations between either user perceptions (*H5*) or preparer perceptions (*H6*), and their corresponding perceptions of the importance of the independent variables. For the “user” group, only Culture ($\rho = 0.831, p = 0.005$) displays a significant positive relationship; for the “preparer” group only Feedback ($\rho = 0.396, p = 0.031$) and Strategy ($\rho = 0.357, p = 0.047$) display significant positive relationships. Neither *H5* or *H6* can, therefore, be supported with any degree of confidence.

Table IV displays the results of the *t*-tests conducted to examine the difference in perceptions between users and preparers. Perceptions are shown to differ significantly

Table IV.
Mean differences for
preparers and user
groups

Variable	Mean scores			<i>t</i>	df	Sig. (2-tailed)	Std. error difference
	Users	Preparers	Difference				
Success	3.30	3.91	-0.61	-2.34	18.60	0.031	0.26
Topmngmt	3.36	4.17	-0.81	-2.77	18.26	0.013	0.29
Strategy	3.33	4.35	-1.02	-3.11	13.41	0.008	0.33
Evaluat	2.10	2.29	-0.19	-0.53	20.89	0.601	0.37
Training	2.46	3.52	-1.06	-3.36	26.71	0.002	0.32
Ownership	2.57	3.52	-0.95	-2.48	26.12	0.020	0.38
Resource	3.14	3.27	-0.13	-0.29	13.47	0.779	0.43
Clarity	2.64	4.09	-1.45	-4.03	15.85	0.001	0.36
Timing	2.38	3.52	-1.14	-3.77	30.07	0.001	0.30
Culture	2.08	3.30	-1.22	-2.87	20.27	0.009	0.43
Team	3.75	4.00	-0.25	-0.74	18.33	0.470	0.34
Feedback	3.31	3.52	-0.21	-0.55	21.63	0.587	0.39

with regard to Success ($p < 0.05$), Topmngmt ($p < 0.05$), Strategy ($p < 0.01$), Training ($p < 0.01$), Ownership ($p < 0.05$), Clarity ($p < 0.01$), Timing ($p < 0.01$) and Culture ($p < 0.01$). The t -test results confirm that the preparer participant group is significantly different from the users group in their perception of the dependent and all independent variables, except for Evaluat, Resource, Team and Feedback (although for the latter Table III has shown a significant group-based difference to exist in the relationship with Success).

Spearman correlations, as well as the t -tests conducted, indicate that there were significant differences between users and preparers in their perceptions of the study variables, findings which support *H7*.

Therefore, the test results provide support for relationships predicted by Shields (1995) and McGowan and Klammer (1997) as well as for two of the seven hypotheses posited by this study. The results indicate the existence of positive relationships between the perceptions of participants of the independent variable Success and their perceptions of Topmngmt, Strategy, Training, Ownership and Culture. The results were also consistent with *H7*. The study confirmed the existence of differences in perceptions between users and preparers of the factors influencing the likelihood of ABC success.

Summary and conclusions

This exploratory study has provided empirical evidence concerning a university experience with ABC by testing seven hypotheses based on a theoretical model similar to that developed by Shields (1995) and McGowan and Klammer (1997).

Consistent with the findings of previous research, this study confirms, for a university setting, that users and preparers of ABC perceive the likelihood of ABC success to be associated with top management involvement and support for the ABC project, linkage to competitive strategies and continuous improvement programs, training provided to employees at all levels concerning designing, implementing and using the ABC system, ownership by non-accountants, and the organisational culture within the implementing organisation that permits change to be embraced.

The study results did not indicate significant associations between the likelihood of ABC success and behavioural implementation factors presented by the new independent variables. The study failed to provide evidence in a university setting that ABC implementation success is significantly associated with the linkage of the ABC project to the University's evaluation and compensation plan, the adequacy of resources provided to the implementation project, the relative timing issues, or the appropriateness of the project team. Neither was consistent evidence generated for the importance of feedback on the progress of the project (since the two groups provided conflicting findings).

Relatively few of the behavioural factors exhibited significant positive correlations with perceptions of success, providing evidence that behavioural factors on their own are not sufficient to explain significantly the likelihood of ABC success in a university setting. This could indicate that preparers, in particular, perceive technical variables to have a significant influence. The innovation diffusion literature (Rogers, 2003) provides a framework for the analysis of factors contributing to successful diffusion, which embraces five attributes: relative advantage, complexity, compatibility, observability and trialability. Extending this framework to ABC implementations

allows us to identify a number of technical factors likely to be of significant influence here: the ability to demonstrate that the benefits of the exercise exceed the, not inconsiderable, costs involved; the complexity of the relationships; the ability to identify appropriate cost drivers and collect the associated data; the ability to cope effectively with joint cost arrangements involving teaching and research, and the difficulties of incorporating ABC and non-financial measurement into existing financial systems. Future research might attempt to consider both technical and behavioural factors, as barriers to accounting change, in a single study.

Test results showed that the two groups (users and preparers) differ significantly in their perceptions of the importance of most of the study variables. Like all empirical studies, this research suffers from several limitations that should be considered in interpreting the results. As with McGowan and Klammer (1997) a single-item scale was used to measure the dependent variable. This single scale was used to rate participants' perceptions of the likelihood that ABC will succeed in the university, even though a single scale cannot capture all aspects of the dependent variable. Further, as with Shields (1995) the single measure of success employed did not specify the definition of success; the study asked participants to rate their perceptions of the likelihood of ABC to succeed without specifically identifying all aspects of this multidimensional concept. Like Shields (1995) and McGowan and Klammer (1997) the study is based on perceptions of users and preparers of the ABC system. It is assumed that participants intended to convey, via reporting their perceptions, information concerning the likelihood of ABC to succeed in the university as well as the availability of the studied behavioural independent variables. Perceptions of participants could be influenced by individual opinions and personal influences such as their reaction to the ABC system. With regard to the study sample, the results were based on a relatively small sample from one university, so that care should be taken in generalizing the results of this study.

Further research would be useful to verify and extend the results of this research study. The behavioral variables tested in this study were of limited usefulness in explaining the perceptions of success among the "user" and "preparer" groups; future research might extend the theoretical model of this study and increase the reliability of the results, by identifying and testing more variables. A tighter specification of the variables might also provide a more significant reflection of perceptions.

References

- Anderson, S.W. and Young, S.M. (1999), "The impact of contextual and process factors on the evaluation of activity-based costing systems", *Accounting, Organizations and Society*, Vol. 24, pp. 525-59.
- Anderson, S.W., Hesford, J.W. and Young, S.M. (2002), "Factors influencing the performance of activity based costing: a field study of ABC model development in the automobile industry", *Accounting, Organizations and Society*, Vol. 27, pp. 195-211.
- Cavana, R.Y., Delahaye, B.L. and Sekaran, U. (2001), *Applied Business Research: Qualitative and Quantitative Methods*, Wiley, Milton.
- Chenhall, R.H. (2003), "Management control systems design within its organisational context: findings from contingency-based research and direction for the future", *Accounting, Organizations and Society*, Vol. 28, pp. 127-68.

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- Chenhall, R.H. and Langfield-Smith, K. (1998), "Adoption and benefits of management accounting practices: an Australian study", *Management Accounting Research*, Vol. 9, pp. 1-19.
- Cooper, R. and Kaplan, R.S. (1991), "Profit priorities from activity based costing", *Harvard Business Review*, Vol. 69 No. 3, pp. 130-5.
- Cropper, P. and Cook, R. (2000), "Activity-based costing in universities – five years on", *Public Money & Management*, Vol. 20 No. 2, pp. 61-8.
- Edds, D.B. and Nielsen, S. (2000), "Activity-based costing: affecting the culture of government and education", *Journal of Cost Management*, Vol. 14 No. 1, pp. 12-5.
- Goddard, A. and Ooi, K. (1998), "Activity-based costing and central overhead cost allocation in universities: a case study", *Public Money & Management*, Vol. 18 No. 3, pp. 31-8.
- Greeson, C.B. and Kocakulah, M.C. (1997), "Implementing an ABC pilot at whirlpool", *Journal of Cost Management*, Vol. 11 No. 2, pp. 16-21.
- Gurd, B., Smith, M. and Swaffer, A. (2002), "Factors impacting on accounting lag: an exploratory study of responding to TQM", *British Accounting Review*, Vol. 34, pp. 205-21.
- Innes, J. and Mitchell, F. (1995), "A survey of activity based costing in the UK's largest companies", *Management Accounting Research*, Vol. 6 No. 2, pp. 137-53.
- Krumwiede, K.R. (1998), "The implementation stages of activity-based costing and the impact of contextual and organizational factors", *Journal of Management Accounting Research*, Vol. 10, pp. 239-77.
- Landry, S.P., Wood, L.M. and Lindquist, T.M. (1997), "Can ABC bring mixed results?", *Management Accounting*, Vol. 78 No. 9, pp. 28-33.
- Lewy, C. and du Mee, L. (1998), "The ten commandments of balanced scorecard implementation", *Management Control and Accounting*, April, pp. 34-6.
- Lukka, K. and Shields, M. (1999), "Innovations in management accounting focus", *Management Accounting*, Vol. 77 No. 3, pp. 33-8.
- McGowan, A.S. (1998), "Perceived benefits of ABCM implementation", *Accounting Horizons*, Vol. 12 No. 1, pp. 31-50.
- McGowan, A.S. and Klammer, T.P. (1997), "Satisfaction with activity-based cost management implementation", *Journal of Management Accounting Research*, Vol. 9, pp. 217-37.
- McKeen, J.D., Guimaraes, T. and Wetherbe, J.C. (1994), "The relationship between user participation and user satisfaction: an investigation of four contingency factors", *MIS Quarterly*, pp. 427-51.
- Mitchell, F. (1996), "Activity-based costing in UK universities", *Public Money & Management*, Vol. 16 No. 1, pp. 51-7.
- Ness, J.A. and Cucuzza, T.G. (1995), "Tapping the full potential of ABC", *Harvard Business Review*, Vol. 95, pp. 130-8.
- Norris, G. (2002), "Chalk and cheese: grounded theory case studies of the introduction and usage of activity-based information in two British banks", *The British Accounting Review*, Vol. 34 No. 3, pp. 223-55.
- Roberts, M.W. and Silvester, K.J. (1996), "Why ABC failed and how it may yet succeed", *Journal of Cost Management*, Vol. 9 No. 4, pp. 23-35.
- Rogers, E.M. (2003), *Diffusion of Innovation*, The Free Press, New York, NY.
- Ruhl, J.M. and Hartman, B.P. (1998), "Activity-based costing in the service sector", *Advances in Management Accounting*, Vol. 6, pp. 147-61.

- Shanahan, Y.P. (1995), "Implementing an activity-based costing system – lessons from Australia post", *Journal of Cost Management*, Vol. 9 No. 2, pp. 60-4.
- Shields, M.D. (1995), "An empirical analysis of firms' implementation experiences with activity-based costing", *Journal of Management Accounting Research*, Vol. 7, pp. 148-61.
- Shields, M.D. and McEwen, M.A. (1996), "Implementing activity-based costing systems successfully", *Journal of Cost Management*, Vol. 9 No. 4, pp. 15-22.
- Smith, M. (2000), "Innovation diffusion", *Financial Management*, June, pp. 40-1.
- Smith, M. (2005), *Performance Measurement and Management: A Strategic Approach to Management Accounting*, Sage, London.
- Sohal, A.S. and Chung, W.C. (1998), "Activity based costing in manufacturing: two case studies on implementation", *Integrated Manufacturing Systems*, Vol. 9 No. 3, pp. 137-47.
- Thorne, H. and Gurd, B. (1995), "Some human aspects of implementing activity-based management", *Journal of Cost Management*, Vol. 9 No. 3, pp. 50-7.
- Young, S.M. (1997), "Implementing management innovations successfully: principles for lasting change", *Journal of Cost Management*, Vol. 11 No. 5, pp. 16-20.

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