THE IMPACT OF EMBEDDING INFORMATION AND COMMUNICATION TECHNOLOGY CONTENT IN ACCOUNTING COURSES AND ITS EFFECT ON OVERALL STUDENTS' PERFORMANCE

P.M.C. THILAKERATHNE[1] and M.W. MADURAPPERUMA[2]

Department of Accountancy, Faculty of Commerce & Management

Studies University of Kelaniya, Sri Lanka lal@kln.ac.lk[1],

wasanthi@kln.ac.lk[2]

Abstract

This study examines the impact of embedding Computer Aided Learning (CAD) in accounting courses in one of the conventional university's accounting courses and its effect on overall students' performance. It differs from the previous research in that accounting undergraduates taught MYOB accounting software in their second year of four year honours degree. At the same time other ICT courses in the accounting curriculum geared towards training students to prepare financial statements using spreadsheets etc. Student performance does not alone describe the ICT content in accounting curriculum and in effect included prior accounting knowledge, English knowledge and gender as other explanatory variables. Multiple regression analysis on student performance shows that prior accounting knowledge and its performance, internship performance, English knowledge at the entry level to the accounting degree programme together with MYOB course performance of students and internship marks significantly explained the overall performance of accounting graduates.

Key words: Computer Aided Learning, student performance, accounting undergraduates, entry level accountants

Introduction

Information and communication technology revolutionize accounting education all over the world. Improving relevance and quality of undergraduate accounting degree programs is one of challenges faced by the curriculum developers. Because, there was a mismatch between the learning outcome expected by accounting educators and employment providers. Addressing this gap upgrading, aligning and revising the curriculum are playing a major role. Because, industry partners were in the view that knowledge in information technology and inadequate (poor) English knowledge resulted to create unemployment or under employment situation. Beginning of the twenty-first century has witnessed a surge in computer based teaching and learning and applying different assessment tools of accounting education. Motive behind the widespread adaptation of computer based delivery of accounting courses include increased availability and reduced cost of software and hardware

(Boyce, 1999), the expectation of applying contemporary delivery methods (Sangster and Mulligan, 1997), enabling accounting educators to handle increasing number of students who envisage to enroll in accounting degree programmes (Boyce, 1999) and pressure on utilizing technological developments and inculcating technology savvy mind set among accounting students to deliver courses. The purpose of this study is to investigate the impact that usage of Computer Aided Delivery (CAD) in accounting education may have on student overall performance. The findings of this study should improve in evaluating the suitability of CAD in improving student's academic performance.

The remainder of this paper is organized as follows. The next section presents the need for research, literature review and the hypotheses development and regression model used to analyzed the data. The subsequent sections present the descriptive statistics of data used for the study. The final section concludes the paper and provides future research directions of embedding information and communication technology content into subject discipline of accounting.

The need for research

Given the momentum of computer integration in accounting education, it behooves accounting educators to investigate the effects of embedding computer aided learning in accounting education. Differential effects could arise such as (a) in comparison of alternative integration strategies, (b) or different ways and methods of using computer education for accounting students. The question is not whether computing will eventually pervade accounting education, but whether it will occur in ways that maximize its contribution to student learning. Without research, educators will not know the extent of learning effects or whether they are integrating computing into curricular in ways that maximize learning.

Literature Review and hypothesis development

Several researchers have investigated the application of information technology in accounting education (Apostolou et al, 2001, Watson et al, 2003). Lane and Porch (2002) studied the impact of computer aided learning and find that Computer Aided Delivery (CAD) of accounting courses have negatively affected trainees' perception on accounting subject. CAD is useful for introducing students to new or difficult concepts and it's advantageous in high growth disciplines, such as accounting, where students enter the discipline with diverse backgrounds and assorted levels of prior knowledge (Boyce, 1999; Bork, 1986). By using this CAD pedagogy students are able to individualize their learning experience. This process puts strong emphasis on student centered learning that allows students to learn at their own pace producing their own learning paths and outcomes, while using structured and or unstructured interactive

lessons (McCourt Larres and Radcliff, 2000). In terms of prior research evidence CAD is a relatively recent phenomenon that has emanated from its gradual integration to the class room. However, CAD learning has been growing in a variety of learning environments; its use in accounting education has been sporadic (McCourt Larres and Radcliff, 2000, Lane and Porch, 2002). Early research studies on student performance have reported ambiguous results, indifferent performance or gradually declining performance of students (Marriot and Mellet, 1994). However, most of the recent research concluded that improvements in student performance as a result of computer assisted learning environment (Groomer, 1981; Perera and Richardson, 2010).

Coulter and Strykler (1994) theorized that commitment to teaching excellence is enhanced when innovative and creative methods are introduced in the accounting education setting. They find that the use of professional software in a graduate tax course stimulated interest in the subject matter because students knew that they might be expected to use the same or similar software package upon entry into the profession. Wilknison and Echternacht (1998) find no significant differences in perceptions regarding the subject matter between students who completed internet-based home work and students who did traditional homework in a financial management class. Folk (1998) find that students in an introductory financial accounting class who completed problems with general ledger software reported that the problems were more interesting, easier and a better preparation for examinations than did those students who completed problems manually.   The main hypothesis in this study is thus;

H1: Computer Assisted Dearning (CAD) improve the student performance

Background Variables

Gender

Research on gender on student's performance had produced mixed or inconclusive results. Only a few students have presented evidence that to show female students perform better than male students (Gammie et al., 2003; Gracia and Jenkins, 2003). Many research focused gender effect on overall student performance concluded that gender has no systematic impact on performance (Thilakerathne & Madurapperuma, 2014); Jackling and Anderson, 1998; Auyeung and Sands, 1994; Eskew and Faley,1988 and Lipe, 1989). Based on the discussion above the following hypothesis is expressed.

H2: Gender is a significantly related to the student performance

Internship Training

Research has shown mixed results as to whether an internship improves student performance. (Duignan, 2002) found no significant difference between the performance (using mean module percentage scores) of internship and full-time business undergraduates. He suggested that this did not mean that students had failed to learn on internship but it was 'suggestive of a failure to exploit to the full the learning potential of the internship with respect to those attributes that are commonly valued and evaluated by academics'. (Duignan, 2002) also argues that 'the skills and competencies that are engendered by successful internships are not easily transferable into academic performance'. (Thilakerathne & Madurapperuma, 2014), found a significant relationship between the performance of Internship and the student performance in Accountancy undergraduates. They argue that 'the skills and competencies that are engendered by successful Internships can be easily transferable into academic performance'. Given the prevalence of research that was support for a relationship between internship in accounting and academic performance, the following hypothesis is proposed.

H3: Internship training is a significantly related to the student performance

Competency in English

Competency in English language and prior accounting knowledge is also significant determinants which affect to student performance. This is typically measured in terms of performance in prerequisite or preceding courses. Several studies concluded that there is a strong positive correlation between prior accounting education knowledge and examination performance (Auyeung and Sanda, 1994; Gul and Fong, 1993; Eskew and Faley, 1988). However, contrary to this Doran et al. (1991) reported a negative relationship between prior accounting knowledge and examination performance. Baldwin and Howe (1982) and Bergin (1983) find that student performance in accounting hand no bearing on previous exposure to accounting in secondary education. Based on the discussion above, the following hypotheses is are expressed;

H4: Competency in English is a significantly related to the student performance

Prior accounting knowledge

Prior accounting knowledge is generally perceived to have a positive influence on student performance. Farley and Ramsay (2009) investigated the impact of previous accounting courses on performance in a mixed student group and find

that students who had limited previous exposure to the subject such as one year or less did not perform significantly better than those without previous exposure. However, Mitchell (1985) find evidence that both prior exposure to accounting at school and underlying numerical ability were likely to have a positive influence on the performance of accounting students in the first level university examinations. Eskew and Faley (1988) in a study of US accounting and business majors and Bartlett et al. (1993) investigating UK accounting majors, find that the significant better performance for students with an accounting background particularly at the introductory level. Consistent with above studies Gul and Fong (1993) find that previous accounting knowledge of Hong Kong students together with aptitude in mathematics were all significantly and positively associated with student performance. Thus, the above discussion reveals that the influence of prior accounting knowledge on overall performance of students is inclusive. Given the prevalence of research that support a relationship between prior accounting knowledge and d academic performance, the following hypothesis is proposed;

H5: Prior accounting knowledge is significantly related to the student performance

Model Specification

In developing the model for this study, considering the literature reviewed positive and negative associations between students' performance and variables affecting such outcomes were considered.

GPA = β0 + β1Gender + β2 ELTU + β3MYOB +β4PRIACC +β5INTERN + εi

Methodology

This study revolves around the performance of students enrolled in undergraduate accounting degree courses. These courses taught at one of the accounting departments in government conventional university known as University of Kelaniya, Sri Lanka. The Department of Accountancy transformed its medium of instruction to English in 2001 and incorporated information and communication technology to its curriculum in 2004. In addition to that accounting software packages procured and taught in the accounting course to enhance quality and relevance of the accounting degree programme. During the period of investigation much of the emphasis was given to embed ICT content into delivery of course of units.

The data was analysed using linear regression in SPSS 18.0. Further analysis was undertaken where possible using t-tests of significance to compare means. In judging levels of significance, standard levels (1%, 5% and 10%) are used throughout.

Research Method

The study is centered on the performance of students enrolled in a second year undergraduates course tilted 'Computerized Accounting". The same instructor taught in the Financial Accounting course unit and consisted of 107 students. The delivery of this course unit further strengthened by introducing MYOB as a practical component. The statistical software SPSS is used to test the null hypotheses with a typical 95 percent degree of confidence.

Construct	Variable	Measure
Regressend		
Performance of examination and achievement of learning outcome	FINALGPA	The percentage marks scored for final examination
Regressors		
USAGE OF MYOB	MYOB	The percentage marks obtained for the MYOB as proxy for the Computer Aided Delivery (CAD)
Prior accounting knowledge	PRIACC	% Marks obtained for a Financial Accounting course unit (BACC 11313)
Gender	GENDER	Assume the value of 1 if male student, 0 otherwise
Competency in English	ELTU	% Marks obtained for an ELTU course unit- English for Business Communication (BACC 13032)

MYOB accounting concepts are taught a blended learning approach that combines 15 weekly lecture presentations with tutorial support. The lecture introduces accounting concepts to students which are then reinforced by the MYOB which teaches the principles as well as application of financial accounting. MYOB developed by Christopher Lee in 1980s allows students to document instant reports for management, for example: debtors' summary, trial balance, trading and profit and loss account, balance sheet, stock valuation,

sales analysis, budget analysis and variance analysis, GST/VAT returns and payroll analysis.

Descriptive results

The sample of study comprises of 107 students who were enrolled in this course unit over three semester. The course content and assessment regime remained unchanged in the relevant period with same teaching faculty involved in delivering the course. In the sample, 47.8 per cent were male students. The average score for the English language course unit that permits the English proficiency was 52.74. Finally the average score for the prerequisite accounting course unit that permits entry in the course was 58.84%.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
GPA	89	2.22	3.97	3.0764	.37495
MYOB	89	45	80	64.09	9.152
ELTU1	89	40	84	52.74	10.750
PREACC	89	31	76	58.84	9.925
Valid N (list wise)	89				
Gender					
Male	47.8				
Female	52.2				

The table 1 illustrates that students scored an average of 64.09 percent for the MYOB course unit, a reasonably high score but scored only 3.07 GPA reveals that the students were able to grasp the competencies and knowledge of computerized accounting. This finding suggests the effectiveness of CAD to enhance the learning outcome.

Table 2

Coefficientsᵃ

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	.362	.219		1.654	.102		
MYOB	.011	.003		3.934	.000		
Gender	-	.046	.268	-2.167	.033	.774	1.292
ELTU1	.100	.002	-.134	1.863	.066	.938	1.066
INTERNS	.004	.003	.127	7.746	.000	.778	1.285
PREACC	.021	.003	.538	2.366	.020	.745	1.343
	.006		.158			.807	1.240

a. Dependent Variable: GPA

The data in table 2 present the result of the regression analysis for the data examined, which comprised of 89 observations. The regression equation was designed primarily to determine whether a positive association can be established between MYOB and exam performance related to the subject called Financial Accounting. The findings from the analysis demonstrate that application of the MYOB, gender and prior accounting knowledge are significant and positive determinants of final examination performance.

The explanatory capability of the model is relatively strong with 70% of the variation of the dependant variable being explained by the independent variables (adjusted R^2 -= .684). Therefore, the findings in this study support the Hypothesis 1 in the MYOB score are positively associated with the final examination score on final exam performance. Checks were made for multicollinearity as shown in table 3 (using variance inflation factors) and the residuals were examined for normality and no problems were found. Accordingly, there is nothing to cast doubt on the appropriateness of the modeling approach. Table 3

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta	Lower Bound	Upper Bound	Tolerance	VIF	B	Std. Error
(Constant)	.925	.241		3.832	.000	.445	1.406		
Gender	.081	.059	.108	1.374	.173	-.036	.198	.919	1.088
	.008	.003	.217	2.556	.012	.002	.013	.797	1.255
ELTU1	.011	.004	.267	3.027	.003	.004	.018	.737	1.357
MYOB	.010	.003	.267	3.231	.002	.004	.016	.835	1.198
PREACC									
PRIT	.008	.003	.239	2.725	.008	.002	.014	.743	1.347

Student gender (GENDER) is the next most significant independent variable and the results suggest that female student demonstrate a superior performance compared with their male counterparts, a trend also observed by Gammie (2003, Kanapathipillai (2011). The findings in this study reject the hypothesis and it is concluded that female students using MYOB perform better in the financial examination.

A similar result was found in the student performance in a prerequisite course. Consistent in the prior evidence, the findings in this study suggests that students who demonstrated superior performance in their prerequisite course and used the MYOB performed better in the final examination. The third is therefore support the hypotheses that the prior knowledge has significant and positive influence on student performance.

Further interrogation of the data using correlation analysis indicates that the application of the MYOB, Gender and Prior Accounting Knowledge are the variables that have a significant correlation with the independent variables and final examination performance. Overall it appear that students learn and combine their knowledge of accounting concepts using the MYOB which is then

tested through the MYOB and assessed in the final examination. The author contend that the correlation between the MYOB usage and the GPA reflect the positive influence on the achievement of student learning outcomes.

Conclusion and future research directions

The finding of the study is consistent with the main purpose of this research to explore the evidence that CAD have an important influence on students learning and performance. The association between the utilization of computerized teaching tool such as MYOB and the achievement of student learning outcomes is consistent with various prior studies and also demonstrate an effect on student performance measured in terms of students Grade Point Average. Improved performance suggests that the CAD has improved the quality of the learning experience providing valuable assistance in dealing with difficult concepts. However, prior accounting exposure, internship effect and gender have significant impact along with CAD embedded delivery on overall student performance. The finding of this study is consistent with Eskew and Faley et al. (1993), Bartlett et al. (1993) and Gul and Fong (1993). This research can be extended by embracing additional explanatory variables such as students' performance level measurements of information communication related content based course unit performance into analysis with an alternative modeling approach.

References

Abdel-khalik, A.R. and Ajinkya, B.B. (1979) Empirical Research in Accounting: A Methodological Viewpoint. Accounting Education Series 4. Sarasota Florida American Accounting Association.

Alkafi, Y. and Schroeder. N. (1986) Manual v computerized practice sets: a test for differences. Journal of Accounting Education 4(3), 19-25.

Apostolou, B. Watson, S. Hassel, J and Webber, S. (2001) Accounting Education Literature Review (1997-1999). Journal of Accounting Education 19(1), 1- 61.

Auyeung, p.K. and Sands, D.F. (1994) Predicting success in first-year university accounting using gender-based learning analysis, Accounting Education: an international journal, (3) (3), 259-272.

Baldwin, B.A. and Howe, K.R. (1982) Secondary-level study of accounting and subsequent performance in the Irist college course. The Accounting Review 57(3), 619-26.

Bartlett, S., Peel M.J., and Pendlebury, M. (1993) From fresher to Enalist: a three year study of student performance on an accounting degree programme. Accounting Education: an international journal 2(2), 111-22.

Bergin, L.J. (1983) The effect of previous accounting study on student performance in the List

college-level ̄nancial accounting course. Issues in Accounting Education 1, 1928.

Bork, A. (1986) Advantages of computer-based learning. Journal of Structured Learning 9, 63-76.

Boyce, G. (1999) Computer-assisted teaching and leaning in accounting: pedagogy or product? Journal of Accounting Education 17, 191-220.

Buckless, F.A., Lipe, M.G. and Ravenscroft, S.P. (1991) Do gender effects on accounting course performance persist after controlling for general academic aptitude? Issues in Accounting Education 6(2), 248-61.

Carpenter, V.L., Friar, S. and Lipe, M.G. (1993) Evidence on the performance of accounting students: race, gender, and expectations. Issues in Accounting Education 8(1), 1-17.

Coulter, F. V.and Stryker, J. P. (1994) Using Professional Software To Enhance Teaching Excellence, unpublished thesis, Proceedings of the National Conference on Successful College Teaching, Orlando, Florida.
Dearing, R. (1997) Higher Education in the Learning Society. National Committee of Inquiry into Higher Education. HMSO: London.

Doran, B., Bouillon, M. L. and Smith, C.G. (1991) Determinants of student performance in Accounting Principles I and II. Issues in Accounting Education 6(1), 74-84.

Doran, L. I. Brief, A.P. and Dukerich , J.M. (2006), Resolving Ethical Dilemmas in Management: Experimental Investigations of Values, Accountability, and Choice, Journal of Applied Psychology, 380-396.

Duignan, J. (2002), Undergraduate work placement and academic performance: Failing by doing, Proceedings of the Annual Research Conference, University of Paisley, Scotland, UK.

Eskew R. K. and Faley, R. H.(1998), Some Determinants of Student Performance in the First College-Level Financial Accounting Course, *The Accounting Review,* Vol. 63, No. 1 (Jan., 1988), pp. 137-147 Published by American Accounting Association.

Farley, A.A. and Ramsay, A.L. (2009) Student Performance in First Year Tertiary Accounting Courses and Its Relationship to Secondary Accounting Education, Accounting and Finance, 29-44.

Gracia, L., & Jenkins, E. (2003). A quantitative exploration of student performance on an undergraduate accounting programme of study. Accounting Education, 12(1), 15-32.

Groomer, S. M. (1981) An Experiment in Computer-Assisted Instruction for Introductory Accounting, *The Accounting Review,* Vol. 56, No. 4, 934-941. 44-62

Gul, F.A. and Fong, S.C.C. (1993), Predicting success for introductory accounting students: some further Hong Kong evidence,

Jackling, B., & Anderson, A. (1998). Study mode, general ability and performance in accounting: a research note. Accounting Education, 7(1), 65-73.

Lane, A. and Porch, M. (2002) Computer Aided Learning (CAL) and its impact on the performance of non specialists accounting undergraduates. Accounting Education 11(3), 217-233.

Lipe, M. G. (1989). Further evidence on the performance of female versus male accounting students. Issues in Accounting Education, 4(1), 144-152.

Perera, P and Richardson, P. (2010) Students' Use of Online Academic Resources within a Course Web Site and Its Relationship with Their Course Performance: An Exploratory Study, Accounting Education: an international journal, 587-600.

Marriot , N. and Mellet, H. (2014)The Financial Awareness of Managers in the Reformed NHS, The Health Services Management Research, 67-75.

McCourt, P. and Radcliff, B. (2000) Computer based instruction in a professionally accredited undergraduate tax course. Accounting Education 9(3), 243-257.

PatriciaCourt   Mc Larres, P and Radcliffe, G.W. (2000) Computer-based instruction in a professionally-accredited undergraduate tax course, Journal of Accounting, 45- 67.

Sangater A. and Muligan C. (1997) Integrating the World Wide Web into an accounting systems course. Accounting Education: an international journal, 5362.

Thilakerathne, P. M. C. and Madurapperuma, M. W. (2014) An examination of accounting internship on subsequent academic performance, International Journal of Economics, Finance and Management Sciences, (2)(1) 8-15.

Watson, S. Apostolou, B. Hassel, J and Webber, S. (2003) Accounting Education Literature Review (2000-2002), Journal of Accounting Education 21(1), 267325.

Wilkinson, K. Echternacht, L. (1998) Internet Homework Activities and Traditional Homework Activities: The Effects on Achievement, Completion Time, and Perception. *Delta Pi Epsilon Journal*, (40)(4) 214-231.