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**INFORMATION AND COMMUNICATION TECHNOLOGY INNOVATION OF WEBLEARN IN
ACCOUNTING EDUCATION**

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Abstract

This research conveys the findings of a study carried out to examine the initiation of an interactive online computer-assisted learning module, called BLENED WEBLEARN, in an undergraduate introductory accounting course at a Polytechnic and universities at the blended learning concept. To enforce student-centered learning in the accounting programme, it requires more efforts from accounting students in their learning experience. However, the educators play an important role to ensure that accounting student are properly guided by providing access to useful learning material, using blended learning web tool when it is easy to develop. It is aimed at the students in the preparation of cash flow statements, using professional accounting software, a topic that from the student perspective is usually considered fairly difficult. Following the pilot of the module, student responses were collected via questionnaire in order to evaluate their perceptions regarding the BLENDED WEBLEARN module Diffusion of innovations theory was utilized as a framework for assessing student responses and to guide further development of modules in other topics within the accounting unit. The results provided to be significant in relation to all four independent variables: relative advantage, compatibility, ease of use, and result demonstrability. Hypostasis testing .The combination of quantitative and qualitative findings indicates that the majority of students formed favourable perceptions regarding the relative advantage, compatibility, and ease of using the module, which further translated into positive intentions regarding prospective use of the module with Professional Accounting Packages as a Learning Resource.

Keywords: Information, Innovation, Accounting Education, Spreadsheet Computation, Web Learn, Cloud Accounting.

Introduction

Past years before the inception of information and communication technology (ICT), accountants in firms employed socially acceptable behavioural method of reporting accounting transactions and events in order to generate books such as Income Statement Account, Statement of Financial Position, income and expenditure account amongst others. Educators do not need a crystal ball to predict that advances in technology will actively influence the future of the accounting classroom (Asino 2014). The Pathways Commission (2012) report sponsored by the American Accounting Association (AAA) and American Institute of Certified Public Accountants (AICPA) recommend that instructors “transform learning experiences to reflect current and emerging technologies.” The Routledge Companion to Accounting Education notes pedagogical considerations should include technology in accounting education (Apostolou, Dorminey, Hassell, and Rebele 2015).

The Conversational Framework, an influential theory developed originally in 1993 and upgraded and expanded by Laurillard (2002), envisions the learning process between the student and teacher as an iterative dialog and describes how technology positively affects student learning in higher education courses (Premuroso, Tong, and Beed 2011). Learn and engage with the technology used in the accounting field. Professors need to introduce students to the various technologies, such as Excel, that they will contend with in the corporate business environment. A recent study by Yu, Churyk, and Chang (2013) suggested that employers evaluated interns as weak in spreadsheet skills, and alumni perceived their weakness in technology competencies. Howieson et al. (2014) interviewed personnel (n ¼3) and employers (n ¼29) at Australian organizations about the importance of technical and nontechnical skills for accounting graduates. Fifty-eight percent of respondents thought that teaching technical skills was the responsibility of the academic institution. Hence, accounting professors are expected to feel comfortable with technology and expose their students to that technology.

Learners today are digital learners and the instructional methods should match their demands (Daher and Lazarevic 2014). Today's students are always online and use technology extensively. College students appear to enjoy technology, believe it to be beneficial, and expect to be able to use it effectively (Khanlarian and Singh 2014). Youth today spend several hours each day using digital technology (Jenkins, Clinton, Purushotma, Robison, and Weigel 2006), with incoming university students labelled as "Digital Natives" who are experienced and comfortable with technology such as computers, cell phones, and other digital tools (Newton, Tucker, Dawson, and Currie 2014). Accounting students have become technologically savvy, and faculty should be encouraged to continue to extend the traditional boundaries (Apostolou et al. 2015). Today's professors are busier than ever and are interested in using tools that save time, engage students, and enrich the classroom experience. The use of technology in instruction requires acquiring new skills and developing a sufficient level of understanding of computer software and the internet (Daher and Lazarevic 2014).

As technology evolves, accounting educators will probably spend less time creating content and more time identifying packaged platforms to use in the classroom (Apostolou et al. 2015). Professors should maintain a dynamic student-centered classroom where technology is a powerful learning tool (Judson 2006). Premuroso et al. (2011) believe that the combined use of appropriate pedagogy and technology can improve the educational experience. A commitment to learning innovation can take many forms. It may be investing in a center for teaching and learning (CTL) to provide faculty with training, mentoring, and resources. Or a commitment to learning innovation may manifest in the recruitment of instructional designers to collaborate with faculty. A focus on institutional learning innovation may involve the decision that all new classroom spaces and renovations will result in active learning spaces, with flat floors and moveable furniture. Or it may revolve around an initiative to embed academic librarians with professors throughout the course development, teaching, and redesign process. They have a research and development (R&D) component. They are committed to scaling advances across the institution, and to moving from pilot projects to regular operations. One example comes from the world of online learning. On its own, an online learning program is not all that innovative. What is innovative is when the school tries to figure out how to bring the lessons, methods, techniques, and resources from online courses to residential courses.

Problem Statement on the Innovation of Web Learn in Accountancy

1. To enforce student-centered learning in the accounting programme.
2. It requires more efforts from accounting students in their learning experience.
3. However, the educators play an important role to ensure that accounting student are properly guided by providing access to useful learning material, using blended learning web tool when it is easy to develop.

Literature Review

Theoretical Frame Work of Web learn on Innovation in Accountancy

The theoretical framework utilised in this study provides a rich and potentially fruitful area for further research and has practical implications for teachers, educational administrators, and vendors concerned with the spread of e-learning in traditional educational institutions.

Using T-O-E theoretical framework to study the adoption of ERP solution technology-organization-environment (T-O-E) framework explain SMEs' adoption of enterprise resource planning (ERP) software. The major issue with T-O-E framework is that some of the constructs in the adoption predictors are assumed to apply more to large organizations, where clients are sure of continuity and less complaints, than to SMEs (Awa, Eze, Urieto, & Inyang, 2011). However, the postulate of T-O-E is similar to Actor Network Theory (ANT) since it emphasizes dynamic capabilities and mutual interplay of technical and social systems. Scholarly works that explain and predict SMEs' high involvement decisions within the framework of T-O-E seems though scanty but demand conscious search effort and using the Bass model to reduce different kinds of risk (Awa, Baridam et al., 2015). Thus, adoption of ERP by SMEs is well-explained by T-O-E framework though it is more driven by technological factors than by organizational and environmental factors. Implicit is that the proposed model will be useful to IS vendors in making investment decisions and crafting marketing programs that appeal to non-adopters since they have more adoption challenges than adopters and to cause adopters to progress in the loyalty ladder.

Baridam and Nwibere (2015) observe that ERP seeks strategic integration of functions and stakeholders into a customized system to streamline operations and build superior service value. Eze, Awa, Okoye, Emecheta, and Anazodo (2013) opine that some of these models/theories evolve from the theory of reasoned action and have their principal constructs cross-cutting though each contributes to the underpinning adoption theory. IDT framework uses the constructs within organization and technology contexts to explain adoption whereas T-O-E stepped further to integrate the constructs of environment (Gangwar, Date, & Raoot, 2014). T-O-E framework is more holistic and size and industry friendly (Wen & Chen, 2010), has robust empirical support in IS field more than other adoption frameworks (e.g. TAM, IDT, TRA, SM, and TPB) (Henriksen, 2006; Hong, Thong, & Tam, 2006; Kuan & Chau, 2001; Yoon & George, 2013; Zheng, Yen, & Tarn, 2011; Zhu, Kraemer, & Xu, 2003) and meets the contemporary scholarly demand (Barrett, Grant, & Wailes, 2006; Jacobsson & Linderoth, 2010; Venkatesh & Bala, 2008) for more social interactive systems that address the ordeals of deterministic system.

The Web as an Innovation in Accounting Education

The ICT innovation that is the focus of this study is an online interactive computer-assisted learning module called WEBLEARN, which we developed in conjunction with a commercial e-learning company as well as specialist instructional designers. It was decided that the topic of cash flow statement preparation in the first-year accounting course was

the one in which students were most likely to benefit from supplementary online interactive instructional materials.

Conceptual Frame Work on Web Learn Innovation in Accountancy

ICT infrastructures provide the platforms upon which community members share content real-time, internet skills offer the technical know-how, and ICT know-how provides the business and managerial skills to develop and operate the applications (Eze et al., 2013; Zhu et al., 2003). Scholars (Metaxiotis, 2009; Scupola, 2009) suggest that technology competence goes beyond physical assets; it includes intangible resources, which perhaps generate competitive advantages for innovators since skills and know-how complement physical assets and are more difficult to imitate by rivals.

Cloud-Based Accounting: The cloud computing trend that has grown increasingly popular in other areas of business is making its way into the realm of accounting. Cloud applications can handle everything from payroll and invoicing to taxes and benefit payments. All financial information is updated as soon as changes occur and can be monitored and managed from a user-friendly administrator dashboard. Automation handles tasks that previously took time away from more important duties. Moving accounting processes to the cloud also removes a burden from the IT department by shifting the responsibility for software management and updates to the cloud service provider.

Empirical Review on Web Learn Innovation in Accountancy

As hypothesized, our empirical results show that DOI theory, as operationalized in this study, was successful in predicting the students' intention to use WEBLEARN for learning purposes. We found that students who used WEBLEARN formed favourable perceptions regarding its relative advantage over other learning resources such as the prescribed text exercises, in particular as an effective platform to learn. Students attributed the compatibility of the resource in the context of the cash flows topic to a multitude of reasons such as: being how they like to learn, and being compatible with their learning style and with all aspects of their learning. Students also commented favourably on the ease of using the program independently. There was positive result demonstrability, as students clearly identified the benefits that they gained from using the WEBLEARN tool. Consistent with the DOI theoretical framework, these adopter students also provided encouraging responses regarding their intended future use of WEBLEARN and their overall level of satisfaction with the program.

In a general definitions in Gault, 2015, Gault, 2016 drew upon the definitions of public sector innovation in the MEPIN project and the definitions in the third edition of the Oslo Manual for the business sector (Bloch, 2010a, Bloch, 2010b; Bugge et al., 2011; Bloch, 2013; Bloch and Bugge, 2013; OECD/Eurostat, 2005). In this section, there is a review of other work in the public and the households sectors and how this work can be accommodated by general definitions of innovation and the various types of innovation. For the last decade, the taxonomy proposed by Windrum (2008), drawing on Kock and Haukness (2005), has been used to classify public sector innovations, an example of which is found in the Australian Public Service Commission report (APSC 2011). Policy innovation' at the ministerial level comes in two forms (Windrum, 2008): "incremental innovation based on policy learning by government and radical innovation sparked by conceptual innovation." Again, it is a question of measuring the presence of innovation, using the general definitions and a survey instrument and adding, either at the same or a later time,

measures of policy innovation – such as learning. Systemic innovation’ “involves new or improved ways of interacting with other organisations and knowledge bases” (Windrum, 2008).

Hypothesis 1:

The innovation attributes of relative advantage, compatibility, ease of use, and result demonstrability will be associated with students’ intentions for future use of WEBLEARN for learning purposes.

Methodology

Data were gathered from an anonymous survey questionnaire administered to students in an undergraduate accounting unit at major universities in Rivers State, at the end of the first semester 2017. The students had used WEBLEARN for learning purposes in that unit during the semester. The questionnaire was administered at the commencement of the final lecture in the unit. One of the authors was available throughout the process. The total number of students in attendance on the day of survey administration was 485. All those present completed the questionnaire, and all questionnaires were useable

All items loaded onto the four expected factors.

These 13 questions were followed by three open-ended questions (shown in Appendix B) seeking more detailed feedback about various elements of WEBLEARN. Consistent with prior research using the Moore and Benbasat (1991) instrument, a single-item scale was used to measure intention to use WEBLEARN if offered in (extended to) other topics in this accounting unit. (WEBEXTEND), the dependent variable in this study.

This questionnaire item was measured on a seven-point Likert scale with polar anchors ‘strongly agree’ and ‘strongly disagree.’

Descriptive statistics for the five variables are provided in Table 1.

Table 1: Description statistics

Variables	Min	Max	Mean	SD
Intension to use WEBLEARN	1.00	7.00	4.74	1.57
Relative advantage	1.00	7.00	4.68	1.23
Compatibiliy	1.00	7.00	4.55	1.20
Ease of use	1.00	7.00	5.06	1.20
Result demonstrability	1.00	7.00	4.52	1.46

N= 485

* Both minima and maxima are equal to the theoretical range. Cronbach’s (1951) alpha was used to assess the internal consistency reliability of each of the scales.

These are summarized in Table 2,

Table 2 shows that all alpha coefficient values are acceptable and are similar to those obtained these results indicate that although modifications were made, all scales displayed similarly acceptable results for internal consistency reliability to the original form of the instrument.

Table2

Scale	Internal Consistency Reliability of the Scale			
	M & B Items	1991 Alpha	This Items	Study Alpha
Relative advantage	5	.90	5	.92
Compatability	3	.86	3	.83

Ease of use	4	.84	3	.83
Result demonstrability	4	.79	2	.84

Analysis and Results

Quantitative Findings

To test our research proposition, a multiple regression model was developed, regressing the four ICT adoption attributes as independent variables on the dependent variable intention to use WEBLEARN if offered (extended) for other topics(WEBEXTEND). Various tests were conducted to check the regression assumptions of normality, linearity, and homoscedasticity of residuals (Tabachnick & Fidell, 2001). The tests revealed no serious violations of the regression assumptions. The results of the regression analyses are summarised in Table 3. Our interpretation of these results follows thereafter. The full (four-attribute) model regression equation statistically significant (p= .000) and explained approximately 37% of the variation in WEBEXTEND (Adjusted R2 = .367). The relative advantage, compatibility, ease of use, and results demonstrability attributes were all positively related to WEBEXTEND and statistically significant with p-values of .000, .008, .002, and .027 respectively.

Overall, these results demonstrate that the relative advantage, compatibility, ease of use, and results demonstrability attributes were all important in explaining students' intention to extend their use of WEBLEARN for learning purposes if the module was extended to other topics in their program of study. Since all four variables are measured in the same units (i.e., seven-point response scale), the relative advantage variable had the most influence and the results demonstrability variable the least influence when controlled for other variables in the model.

The variables in the model can explain 36.7% variance relating to students' intention to extend their use of WEBLEARN for learning purposes if the module was extended to other topics in their program of study.

Table 3

Results of regression of ICT adoption variables on intention to use WEBLEARN if offered (extended) for other topics (WEBEXTEND)

Variables	four- attribute model			P-value
	Beta	SE	T	
Constant	.244	0.287	.85	.394
Relative advantage	.500	0.073	6.85	.000
Compatibility	.184	0.069	2.68	.008
Ese of use	.183	0.059	3.10	.002
Result demonstrability	.088	0.040	2.22	.027

R2= 37.2%, Adjusted R2 = 36.7%, F4= 71.02, p =0.000

The majority of student responses were highly positive, as shown by comments such as:

Student comment	Item#
The feedback is very detailed and easy to understand.	2
I always check it even when I got it right	4
The feedback is quite helpful and I did check the feedback even when right.	4
I always checked feedback. Feedback was excellent, never made the same mistake twice.	4

Very useful feedback.	4
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However, other students were more critical about the usefulness of the feedback function, as illustrated by the following comments:

Student comment	Item#
Some features were good, some not so good. If right I don't check, some simply state 'you are wrong', not why you are wrong, which can get frustrating.	4
I didn't check the feedback.	4
It's quite good but could be better if you add more explanation	4
Please give reasons for correct answers as well.	4

The students identified WEBLEARN as having certain features which surpassed those of the required text, as represented by the following excerpts:

Student comment	Items #
Provides better method of learning than the problems in the textbook. Those problems come without feedback, unlike WEBLEARN	4
There are not enough questions and answers in the book.	4
There are solutions provided in the Web, which tell me where my mistakes are.	4
There are solutions provided in the Web, which tell me where my mistakes are.	4

The feelings of frustration observed with the feedback function in the second category of responses indicate negative perceptions about the relative advantage of the feedback function when using WEBLEARN.

Students' comments indicated that DOI relating to the compatibility factor were made up of several attributes surveyed in the questionnaire comprising the compatibility factor. One category of student responses indicated that WEBLEARN was compatible with cash flows and other 'practical' or quantitative topics with similar characteristics, as shown by the following comments:

Student comment	Item #
It may help overall understanding. Due to the high level of practical work in cash flows, very good for this topic. Not as good for other theoretical topics.	6
I think it should be useful if you introduce the program for perpetual and periodic inventory exercises.	7
It is quite useful for practising the steps of cash flows. It helps develop the knowledge for beginners of cash flows.	8
I think the topic of accounts receivable should be on the Web as well.	7
Other topics that could be given on the Web are non-current assets and inventory.	7
More topics, including depreciation and inventories.	7
Other topics such as inventory which are practical rather than theory-based should be introduced.	7

The responses above indicate that WEBLEARN is compatible with the way these students like to learn practical topics. The other topics that the students suggested by name include accounts receivable, depreciation of non-current assets, and perpetual and periodic

inventory. All these topics have significant ‘practical’ components similar to those of cash flows.

Another interesting finding that emerged from this analysis is that the WEBLEARN format appears to offer better compatibility with the tutorial component of these topics than the set textbook. The last comment suggested that WEBLEARN exercises would facilitate greater independent study by students and hence allow tutorial time to be utilized in a more productive manner.

Student comment	Item #
Random generator seemed to create numbers in the same ratio. It gets boring! Please vary also between profit and loss.	8

This student seemed to have found patterns in the generation of numbers for additional questions. The process of random number generation occurs after a student has completed every question once. This student obviously required a greater challenge than the one provided by WEBLEARN, which is an issue that will affect several of our advanced students, rendering the current format incompatible with their learning needs. Thus they understood the advantages of having this particular learning tool and were capable of articulating these benefits to others, as the following comments illustrate:

Student comment	Item #
Explanations enhanced my understanding of cash flows. Very helpful.	13
It explains where I went wrong.	13
The Web exercises allow me to see mistakes, and then repeat the problem, so I get better at understanding cash flows each time I do the question.	13

Findings

The qualitative responses to the questionnaire were analysed by the four independent variables examined in the quantitative analysis. This allows us to provide cohesive evidence relating to each variable and gain insights into the relative importance of qualitative attributes surveyed in the questionnaire. They are outlined as follows. The qualitative data indicate mixed feelings regarding the feedback component of WEBLEARN for cash flows. Although most students appreciated the feedback, it seems there was great potential for improvement in this aspect of the software. Many student comments relating to the relative advantage factor were about effectiveness in learning (Item 4 in the survey questionnaire). Findings, notwithstanding areas identified for further improvement, portray positive student perceptions regarding the attributes of relative advantage, compatibility, and ease of using WEBLEARN as a learning resource for cash flows and other practical topics. Student responses regarding their intended future use of the module support the plausibility of the DOI framework as a valid form of evaluating the potential spread of e-learning innovations. Furthermore, the findings indicate that positive student perceptions regarding the attributes of innovations translated into positive intentions regarding future use of WEBLEARN.

In summary, the responses in this section suggest that WEBLEARN, when used for practically oriented topics such as cash flows, is compatible with the learning requirements for the majority of the students in our sample. The findings in this section suggest that we

should focus on providing additional modules for the other practical topics. However, while advanced students will generally adopt learning innovations, we need to ensure that the module provides challenging and stimulating extensions in order to maintain their interest.

Conclusions and Recommendation

In evaluating the effectiveness of WEBLEARN as a learning tool for the topic of cash flows, the evaluation focused on student perceptions relating to the attributes of WEBLEARN as an innovation in their learning environment the qualitative results have provided us with greater insight into each of these attributes pertinent to the use of WEBLEARN from the students' perspectives.

The issues identified when evaluating the responses from the student sample include: the need to expand the level of detail and scope of the feedback function; the opportunity to expand the number of topics offered in WEBLEARN format, while limiting the use of WEBLEARN to topics with a high focus on practical skills development; the need to integrate more challenging components for advanced students; and the need to form a focus group committee which will include student representatives to formally evaluate the format and layout of the various components in WEBLEARN.

The findings of this study indicate that unit conveners seeking to introduce e-learning modules can apply DOI theory and specifically consider students' perceptions regarding certain attributes associated with these modules.

IT-based innovations are highly differentiated technologies for which no single proposed adoption model is all-encompassing; adoption takes place after many factors had been carefully considered. They are complex, risky, and integrated systems that reposition enterprises' competitive advantage subject to knowing and managing the critical success factors. Building competitive advantage via ERP systems encompasses the fundamental platforms for transaction processing (the primary focus of ERP studies) and the extended platforms (EERP) for supply chain management, customer relationship management, knowledge management, decision support systems, and strategic management.

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