

The Use of IT in Teaching Accounting in Egypt the Case of BeckerConviser

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ABSTRACT

The use of information and communication technology with its different tools and techniques is penetrating different aspects of life with various implications. The use of the Internet and the World Wide Web as well as the emerging of different communication channels have brought the world closer and contributed to the concepts of globalization and the extended enterprise. The educational sector at large has been one of the beneficiaries of the use of different information and communication technology tools and techniques. This paper focuses on a research that has been conducted in Egypt to study the use of emerging information and communication technology tools in teaching accounting. The paper reports the results of the preliminary analysis of the research that focuses on a program called BeckerConviser. The program is conducted through the Institute of Management Development of the American University in Cairo. The study addresses the feasibility and effectiveness of using unconventional technologies in delivering accounting knowledge.

Key words: Teaching Accounting, Information Technology, Education, IT Transfer to Developing Countries, Knowledge Management, Egypt.

INTRODUCTION

One of the most important questions that currently face research in accounting education is what causes an individual to adopt new information technologies? Are they factors that relate to his/her inherent personality and background or is the acceptance of information technology driven by other external factors that can be influenced by educators and managers. This concern is a direct result of the technological advancements occurring all over the world. Over the past decades, technological developments and innovations have been progressing at an exponential rate. The impact such technological advances can be felt at the individual, organizational and societal levels through the use of personal computers, the Internet, the world wide web, cell phones, and digital cameras in different daily activities. Moreover, on the professional level, the diffusion of computers and the use of the Internet and different software applications have facilitated recording business transactions and calculations while ensuring quality, speed and accuracy. On the knowledge diffusion level, the learning process has also been dramatically affected by those technological advances with multi-implications on information dissemination and knowledge acquisition.

For example, when focusing on the accounting discipline, several educators and researchers envision that the future accounting classroom will deploy advanced technology to accommodate a combination of both in-class and distance learning audiences, with seating arrangements for trainees and workstation equipment. These advances will allow the instructor to incorporate knowledge and discipline contents from various sources and using different media both traditional and unconventional. Moreover, Al Hashim et al. (2003) further predict that physical campuses will decay and crumble in the near future with the continuous growth of borderless societies and extended enterprises. Such trend can also witness the developments of hybrid models of teaching and knowledge delivery that can combine the best of both stages of educational advancements.

Researchers in accounting education have reported that the use of information and communication technology in the classroom provides the ability to cut cost, while reaching a wider audience through tools such as the world wide web and video conferencing, allow for standardization of quality of instruction, and enable each student to learn at his/her own pace. The use of information technology in classrooms allows schools to expand their markets, respond to the business and environmental requirements, support cross cultural and cross functional teams of trainees to engage and work together, and allows faster and more practical cooperation between instructors from various nations while maintaining the targeted level of quality delivery of knowledge and education. The use of information technology in the classroom can allow more time and space flexibility for instructors and trainees to use the educational materials. It can also allow for continuous testing of trainees of the contents of such materials, and allow the trainees more freedom in taking initiatives, learn on their own, be more creative, and individually study at their own pace.

However, these advantages are hindered by the presence of several challenges that arise from the use of various information and communication technologies, including the need for expensive infrastructure and large startup costs, finding qualified instructors, and the lack of face to face instruction, which may diminish the trainees interpersonal, social, and communication skills. Many studies have been developed recently to react to these problems during the period 2000-2002 (Watson et al, 2003). These issues are further intensified in developing countries due to the lack of a complete infrastructure including the main building blocks such as financial resources, human resources, information resources and technological resources. The level of accounting education in developing countries is rather low and Egypt is not an exception. Therefore, it is crucial to find ways to speed up the educational process of its citizens and one of the venues could be distance learning and computer based technologies, which could lead to a cheaper process and yet as effective and as efficient. However, to date most of the implementations took place in developed nations and there is an urgency to test the environment in a developing setting (Rose and Straub, 1998, Dahawy et al, 2002).

This paper demonstrates the initial findings of a more comprehensive study assessing the accounting education processes, where the hunger for technological advancement in accounting education is hindered by the lack of financial resources and basic infrastructures amongst other elements. During the last few decades, investment in infrastructure development in information and communication technology has witnessed major steps especially with the establishment of the Ministry of Communications and Information Technology in 1999 and the inclusion of information and communication technology diffusion on the government agenda as well as the continuous partnership with the private sector that can turn-around the level of technology penetration in the society. This paper focuses on the Becker-Deviser Program conducted through the Institute of Management Development of the American University in Cairo and addresses the findings of the study that aimed at assessing the use of information technology in teaching accounting and the effectiveness and efficiency technology brings of the knowledge delivery process. It presents a phase in the research that will be taken further into more institutions, more courses and programs and more trainees to be able to draw generalizations and tests hypotheses.

EVOLUTION OF INSTRUCTIONAL METHODS USED IN TEACHING ACCOUNTING

The accounting instructional methods have recently witnessed rapid change in a relatively short period of time. Before the mid 20th century, the technology used for accounting instruction consisted of nothing more than chalk and talk. The 1950s and 1960s, witnessed minor changes with the rare use of flip chart on an easel in addition to audio visual equipment like a movie, filmstrip or projectors. Video tapes and overhead transparencies began to appear in classrooms during the 1970s, and by the end of the 1980s, there was the diffusion of the computing revolution reflected in the establishment of computer labs, as well as the adoption and incorporation of computer applications in the accounting curriculum (Al Hashim et al, 2003). However, to date such steps are still in their infancy stages in many universities in Egypt. There have been some developments in teaching accounting but not well diffused across all universities and institutions in Egypt and the use and application of information and communication technology vary from one place to the other (variations mainly depend on the deployment of infrastructure taking place and the availability of financial resources and human capacities capable of using such technology).

The progression of the 1990s brought rapid development in computer and networking technology and its applications. Computers are now becoming more and more user friendly and a large number of trainees entering colleges are computer literate due to the fact that they possess a computer at home and most of them have an Internet connection at home or from work or both. Computer applications, especially, presentation tools, such as Microsoft PowerPoint, help enhance the methods of education and content delivery. Additionally, the use of the Internet and World Wide Web gives infinite access to a wealth of information and knowledge that represents a repository of

content available for trainees as well as instructors to use and benefit from pending their commitment to different intellectual and copyright laws. Computer and video-based teaching have been around for some time now. More developments in that direction are taking place on a regular basis pending the new tools and techniques being developed by the industry. Most recently, the ready-made tutorials have been produced using CD-ROMS and have witnessed remarkable success from the start being widely diffused in the marketplace around the world.

The progression in information and communication technology raises the issue of the importance of possessing and developing the necessary technological skills among accounting professionals, professors, instructors and trainees all around the world in order to maintain a competitive edge both at the local and international levels. Much of these developments are clearer in developed nations than in developing nations because the integration of information and communication technology in teaching accounting is hindered by the lack of resources and required infrastructure building blocks. Unfortunately, there are many sources in the literature covering the use of information and communication technology in teaching accounting in developed countries but very few studies have attempted to test these relations in developing nations (Dahawy et al, 2002). This research attempts to focus on this issue and explore the developments taking place in teaching accounting in a developing nation: Egypt using information and communication technology.

THE USE OF ICT IN ACCOUNTING EDUCATION

In the past years several researchers have studied the application of technology in the accounting classroom (Apostolou et al, 2001, Watson et al, 2003). Halibi et al (2002) surveyed introductory accounting trainees to determine trainee attitudes towards tele-teaching versus traditional in-class lectures. They found that most trainees preferred the traditional face-to-face approach of teaching. Moreover, Lane and Porch (2002) studied the impact of computer aided learning on performance of accounting undergraduates in the UK and found that computer-aided learning technology has negatively affected the trainees' perception of accounting as a subject. Peterson and Reider (2002) reported that trainees had an overall positive experience for the use of computers in certification in financial management. Crandall and Philips (2002) found that hypertext learning could be used in accounting classes to enhance case based instruction. Rudolph et al (2002) found that only 17% of the trainees would take another interactive television course when examining the impact of interactive television on learning. Mahoney and Welch (2002) reported that 96% of their accounting trainees sample indicated that the use of PC movies was very beneficial. These findings indicate that there is a variety of reactions towards the use of advanced and different information and communication technologies in teaching in general and in specific disciplines in particular.

The sample of accounting trainees studied by McCourt and Radcliff (2000) reported that computer-based instruction made the material more interesting and stimulating from trainees in the UK. Moreover, Green, Reinstein, and McWilliams (2000) found that trainees' interest in accounting increased in the interactive courseware group when compared with the traditional lecture problem solving group and that trainees generally found the interactive courseware to be easy to use and as effective as the traditional methods. Most of the research was conducted in developed nations. No present evidence indicates that such research and results can be applied to developing nations, especially with the varying environments and the role of different cultures that affects the introduction, diffusion and use of information and communication technology. The Technology Acceptance Model-TAM (Davis, 1989) is suitable for testing the application of information technology in accounting education in developing nations since it has shown robustness across the spectrum of information technology applications, has been well researched, and gives easily interpretable results (Rose and Straub, 1998). In other terms, TAM has been reported to be a consistently good predictor of the use of information technology in developed countries (Kamel and Assem, 2003, Rose and Straub 1998, Adams et al, 1992, Davis, 1989 and 1985).

Loch, Straub and Sevcik (2000) offer two main reasons why the transfer of information technology to developing nations is difficult and that relate to a) the cultural differences affecting systems development and implementation and b) the prevailing government policies and regulations that influence information technology transfer. Within the context of testing the effectiveness and reliability of using information and communication technology in teaching accounting, it is important to assess the role of culture in the technology transfer in light of the arguments made by Loch et al. (2000). The impact of the role of culture represents a milestone in the successful diffusion of information technology since it varies from one nation to another and is bound to a number of complex definitions and shared values amongst other aspects (Straub et al, 2002). It is important to note that research has proved in many contexts that culture impacts the acceptance of technology. Respectively, it is important to understand the impacts and role of culture to be able to project the likelihood of the success of the introduction of information technology (Loch et al, 2000). However, the role of culture is more or less localized and that is why it is important to study the role of

culture within the environment of implementation because although the role of culture is powerful, cross cultural conflicts between different nations affects the information technology systems and processes (Straub e al, 2001).

TECHNOLOGY ACCEPTANCE MODEL (TAM)

Trainees and instructors need to develop new skills and knowledge of the current technology through continuous improvement of their capacities and upgrading of their skills. However, implementing the necessary changes is faced with many challenges. Many factors, including costs of technology adoption and individual differences, are too high and may represent an enormous barrier that needs to be overcome and turned into an opportunity that decision makers should capitalize upon to make technology diffusion and deployment a success. Age, educational background, beliefs, personal biases are all factors that affect the acceptance of the newly introduced and/or transferred technology. It is important to note that people in developing nations might use information technology with cultural biases if they work in multinationals or if they had spent some time in developed nations (Straub et al, 2001). This could be a contradiction from their workmates who were not exposed to the same experiences. All these conditions, developments and differences have triggered the development of a number of models and theories that address the issue of technology adoption and acceptance such as the theory of reasoned action (Ajzen and Fishbein, 1975 and 1980), theory of planned behavior (Ajzen and Madden, 1986), theory of diffusion of innovation (Rogers, 1983), and TAM (Davis, 1989). The above mentioned models have extensively referred to TAM which received significant support and proved its success and reliability in both forecasting and interpreting behavior across a broad range of domains (Davis, 1989). The reason may be due to the simplicity of its assumption and the wealth of recent empirical support for it (Agarwal et al, 1999). Figure 1 demonstrates the relationships that TAM represents with an emphasis on the perceived ease of use and the perceived usefulness, which are key elements in the assessment of the theory of technology acceptance, which actually represented the basis for evaluating the reasons behind using information and communication technology in learning accounting from the trainees perspective, which is the focus of this study. Figure 1 presents TAM as used in this study.

The reason why TAM was selected for this research is that its objective is to interpret the factors affecting technology acceptance through its simple and powerful model (Davis, 1989). TAM consists of two beliefs; perceived usefulness (PU) and perceived ease of use (PEOU), which reflects the attitudes and behavioral intention leading to accepting technology. PEOU can be defined as the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). In other words, the more the person thinks of a technology as being easy to use, the greater probability he/she will be willing to adopt and use such technology. PU is defined as the degree to which a person believes that using a particular technology would enhance his/her performance (Davis, 1989). Consequently, the more an individual perceives a technology as being useful, the more he/she will be willing to adopt it and utilize it. Applying PU and PEOU to education and training, it is important to say that the easier and the more user friendly the technology tool is, the more it will be adopted, the more it will be able to communicate information, and the more the trainees and instructor will regard as useful.

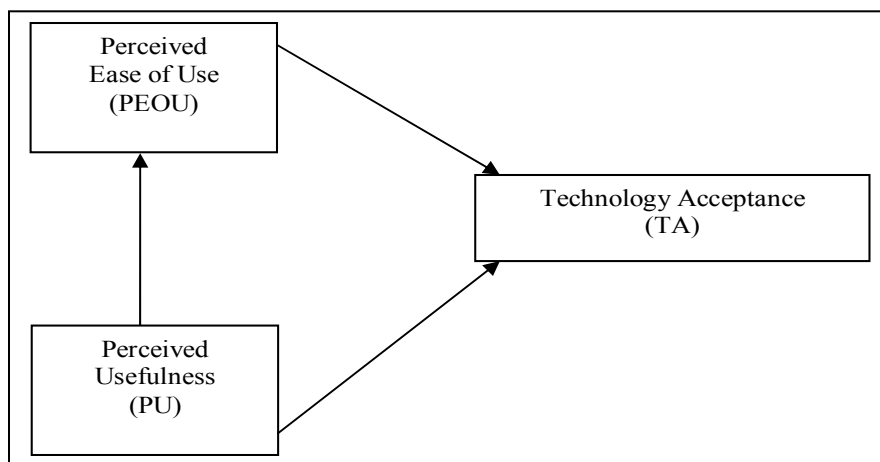


Figure 1: Relationship of TAM to Perceived Use and Usefulness.

The research variables tested in this study in its first phase covered in this manuscript are perceived ease of use (PEOU), perceived usefulness (PU) and technology acceptance (TA) within the context of the Becker-Convisher program. Such elements are directly extracted from TAM. PEOU acts as a dependent and independent variable

simultaneously. PU acts merely as an independent variable while TA acts as a dependant variable that depends on both PU and PEOU. Table 1 summarizes the variables that are being tested. The case study focused on two main research issues; the effect of incorporating technology with accounting education and training and the degree of acceptance of the trainees to using the self-based CD technology. It is also important to note that the role of culture in the overall assessment is embedded in the research design. The role of culture is tested in the context of a developing nation: Egypt. Table 1 presents the variables that will be studied.

Variable	Description	Type	Associated Data Type	Scale
TA	Technology Acceptance	Dependant	Ordinal	Discrete (0-5) 0: Accept,5: Reject
PEOU	Perceived Ease of Use	Independent/ Dependant	Ordinal	Discrete (0-5) 0: Easy,5: Not Easy
PU	Perceived Usefulness	Independent	Ordinal	Discrete (0-5) 0: Useful,5: Not Useful

Table 1: Research Variables.

Based on TAM the hypotheses set and tested during this study mainly describe the relationships between different research variables as shown in table 2. The study mainly covered technology acceptance in terms of the acceptance of the trainees to capitalize on various information and communication technology. In this study, the rate of acceptance is based on the trainees’ acceptance of using technology in learning accounting and the effectiveness of the methods utilized. It is important to note that the trainees had the choice between attending the accounting courses in the most traditional in-class form as the case in most courses using the conventional techniques. The options provided also indicate that the trainees adopting the CD format were willingly choosing the new unconventional methods implying their conviction and acceptance of using the new technology-based method.

Null Hypotheses	Alternative Hypotheses
PU has no significant effect on TA	PU has a significant effect on TA
PEOU has no significant effect on TA	PEOU has a significant effect on TA
PU has no significant effect on PEOU	PU has a significant effect on PEOU

Table 2: Research Hypotheses.

CASE DESCRIPTION

BeckerConviser is a division of Devry Inc, which is a large publicly held higher education company whose main objective is to provide trainees with the required training that enables them to pass exams to get professional certification in a variety of disciplines. BeckerConviser was launched in Egypt in 1996 through the Institute of Management Development at The American University in Cairo offering three main courses; Certified Public Accountant (CPA), Certified Management Accountant (CMA), and Certified Financial Analyst (CFA). BeckerConviser (Egypt) mainly depends on pre-recorded CDs that offer comprehensive explanation, examples, and problems that cover the concepts, constructs and information needed by the trainees. CDs usually run in the classroom and are used as the primary source of instruction. However, during the class time there is always an instructor who acts as a moderator to explain some of the issues that might not be self-explanatory in the newly introduced technology-based media. CDs are developed to ensure that all trainees from around the world receive the same quality of education irrespective of their location of the offering institution.

It is important to note that trainees with English as their second language frequently find it difficult to follow up with the tutorial, without the moderator, since the tutorials have been set for native English language speakers. Respectively, the presence of the tutor becomes vital in the classroom. Respectively, the quality of the message and knowledge delivered by the tutor is a deciding factor in the effectiveness and efficiency of the training provided. In addition to the fact that from a cultural perspective, in some markets, in-class interaction and class discussions are still favored. The case of BeckerConviser represents an opportunity to assess the acceptance of technology in the context of a developing country: Egypt.

METHODOLOGY

The research method used included the use of a survey questionnaire among the sample of trainees studying for the accounting professional certification offered by the Institute of Management Development of the American University in Cairo. The course is part of the BeckerConviser program. The objective of the questionnaire was to illustrate and examine the relationship between the research variables by measuring trainees’ beliefs and intentions. The study focused mainly on the trainees of the Certified Public Accountant (CPA) course. The questionnaire was coupled with a set of open-ended interviews with selected trainees and instructors delivering modules in the course. The questionnaire was distributed to a sample of 150 trainees with a return ratio of 66% having 100 trainees only responding to the questionnaire. This pilot sample will be used as a model for the future stages of the research which is supposed to cover a wider variety of courses, different offering institutions and a wider sample of trainees.

Data Findings and Analysis

The sample covered in the study was male dominated with 74% of the respondents being males and 26% females. Nearly all of the subjects ranged in age from 20 to 40 years old as shown in table 3. The focus of the study is the reporting of the trainees and their satisfaction with the use of the CD tutorials in-class as a new channel for knowledge delivery. Additionally, trainees were encouraged to give any additional comments they have about the course and the technology deployed. The study also attempted to test whether TAM will predict the use of information technology in accounting in Egypt. The proposed hypothesis presented was based on the argument that “the more information technology is perceived to be useful the more likely it would be accepted and used”. Furthermore, “the more information technology is perceived to be easy to use, the more it will be accepted and used”. Table 3 presents some descriptive statistics relating to the participants and the variables under study.

Reliability is tested to ensure that results could be repeated when different subjects take the test under different occasions. Internal consistency analysis was separately performed for each of the constructs of the of the TAM model. Table 4 shows the Cronbach’s alpha corresponding to PU, TA and PEOU. In general a reliability coefficient of 0.80 or higher is considered as “acceptable” (Peterson 1994).

Descriptive Statistics		
Participants		
Sex	Male	74
	Female	26
Age	20-30	76
	30-40	21
	40-50	3
Education	Undergraduate Degree	96
	Graduate Degree	4
Variables	Cronbach’s Alpha	Mean
TA	0.893	2.66
PEOU	0.871	3.16
PU	0.915	3.09

Table 3: Descriptive Statistics.

As evidenced in Table 3 the reliability values for this study range from 0.871 to 0.915 which are greater than the recommended reliability. Accordingly, the results of this survey provide strong evidence that the instrument is reliable.

$$\begin{aligned}
 \text{Model 1} & \quad TA = F[\alpha_1 + \beta_1 PEOU + \varepsilon] \\
 \text{Model 2} & \quad TA = F[\alpha_2 + \beta_2 PU + \varepsilon] \\
 \text{Model 3} & \quad PEOU = F[\alpha_3 + \beta_3 PU + \varepsilon] \\
 \text{Model 4} & \quad TA = F[\alpha_4 + \beta_4 PEOU + \beta_5 PU + \varepsilon]
 \end{aligned}$$

Figure 2: Four Cross-sectional OLS Models.

An estimated four cross-sectional OLS models were developed to test the hypotheses are listed in Figure 2.

The first model tests if PEOU has an effect on TA using α_1 as the equation's intercept and β_1 as the coefficient associated with PEOU. The second model tests if PU has a significant effect on TA. The third model looks at the cross-correlation between PU and PEOU and the fourth model uses a multivariate regression to see if the results from the first three models are robust or not. Model 4 checks if both PU and PEOU both have significant effects on TA simultaneously through checking the strength of the two unvaried models (1 and 2). The focus of the analysis is the β coefficients' signs and significances for the different models. It is important to note that all β signs conform to the research expectations and they are all significant at the 99% level as shown in tables 6-9.

The results indicate that as expected PU has a significant effect on PEOU; PEOU has a significant effect on TA, and PU has a significant effect on TA. In other terms, all the null hypotheses from table 2 have been violated. More broadly, the regression results seem sensible. The explanatory power is substantial, since the R^2 and the adjusted R^2 for all models are both over 45%. Table 4 presents the results of the regression that relates the effect of PEOU and PU. Table 5 presents the results of the regression that relates the effect of PEOU on TA. Table 6 shows the results of the regression of PU on TA, and table 9 shows the detailed results of the multivariate regression that show the results of the regression of the simultaneous effect of PEOU and PU on TA.

$PEOU = \alpha_3 + \beta_3 PU + e_3$		
	Coefficients	P-value
α_3	1.0802	> 0.001
β_3	0.3229	> 0.001
R^2	0.4161	

Table 4: Regression Results.

The results of table 4 indicate that PU has a significant effect on PEOU as expected by TAM. This means that perceived usefulness has a direct and positive effect on perceived ease of use. The respondents' belief of the perceived usefulness of the CD tutorial methods significantly affects how they perceive its ease of use.

$TA = \alpha_1 + \beta_1 PEOU + e_1$		
	Coefficients	P-value
α_1	1.0949	> 0.001
β_1	0.5098	> 0.001
R^2	0.4646	

Table 5: Regression Results.

The results of table 5 indicate that PEOU has a significant effect on TA as expected by TAM. Perceived ease of use has a direct and positive effect on Technology acceptance. The respondents' belief of the perceived ease of use of the CD tutorial methods significantly affects their willingness to accept it in the classroom.

$TA = \alpha_2 + \beta_2 PU + e_2$		
	Coefficients	P-value
α_2	0.5927	> 0.001
β_2	0.6569	> 0.001
R^2	0.5359	

Table 6: Regression Results.

The results of table 6 indicate that PU has a significant effect on TA as expected by TAM. Perceived usefulness has a direct and positive effect on technology acceptance. The respondents’ belief of the perceived usefulness of the CD tutorial methods significantly affects their willingness to accept it in the classroom.

$$TA = \alpha_4 + \beta_4 PEOU + \beta_5 PU + e_4$$

	Coefficients	P-value
α_4	0.5546	0.0055
β_4	0.4564	0.0000
β_5	0.2174	0.0063
R^2	0.5704	

Table 7: Regression Results.

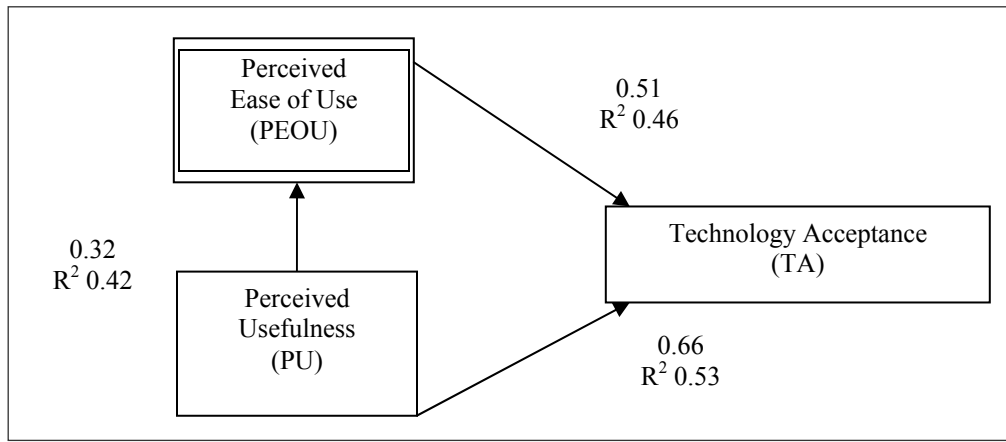


Figure 3: Analysis Summary.

Additional interviews with sample trainees and instructors showed that when designing methods for teaching the CPA course, factors like educational background and demographic characteristics should be taken into consideration due to the variances in cultural settings, norms and beliefs. For example, the language factor may be a deciding factor if trainees’ second language in English making it difficult to follow up with the CD tutorials. Therefore, to overcome some of the perceived problems the CD tutorial should be used as a supplement rather than a supportive tool. In developing countries, such as Egypt, direct interaction between trainees and their professors is of great value. It helps the trainees build trust in the material they are learning. Figure 3 demonstrates the analysis of the summary of the results.

CONCLUSION

Based on the research conducted in this study, TAM proved its validity when applying it to teaching accounting in Egypt. The trainees seem to link ease of use and perceived usefulness as expected. Moreover, they have indicated that their acceptance of the new tools in teaching such as CDs is highly dependent on the perceived ease of use and perceived usefulness of the tool. However, it is important to note that trainees still showed interest in the role played by the classroom. Therefore, the hybrid model becomes so important since it combines both traditional and unconventional tools and techniques. Some important factors involved and representing key issues here included culture, educational background and computing readiness of the trainees. This study represents the first phase of a more comprehensive study that is already underway and should have a larger coverage beyond the case of BeckerConviser which would then make it more valuable in generalizing the results. With respect to future research, there is a need for more to be done to enhance understanding of teaching accounting in developing nations in general, especially through the use of information technology. The experience of BeckerConviser is not unique in Egypt in the sense of using information technology in education and training however it is a leading model in the context of teaching accounting and the results reached represent a good start for more in-depth research that could target more variables, dependent and independent factors that could determine not only the role of technology

acceptance as a model but that could also relate to the theory of diffusion of innovation especially in the context of a developing country.

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