Perceptions of the Usefulness of Virtual Learning Environments in Accounting Education: A Comparative Evaluation of Undergraduate Accounting Students in Spain and England

Rosario López Gavira & Kamil Omoteso

Perceptions of the Usefulness of Virtual Learning Environments in Accounting Education: A Comparative Evaluation of Undergraduate Accounting Students in Spain and England

ROSARIO LÓPEZ GAVIRA* and KAMIL OMOTESO**

*University of Seville, Spain; **De Montfort University, UK*

ABSTRACT *As the power of the virtual world continues to manifest itself in people's quality of life and capabilities (including learning), this paper aims to assess accounting students' perceptions of the usefulness of Virtual Learning Environments (VLE) to their learning experiences. It also considers the factors that may influence students' preferences for the VLE compared to face-to-face learning. The study administered a structured questionnaire to final-year undergraduate accounting students in two universities, one in Spain and the other in England, and applied t-test, correlation and factor analyses. Although the results show that students from both countries find VLE tools and techniques useful for their learning, within the frame of the contingency theory of education, the study found that students' perceptions of the usefulness of VLEs are strongly dependent upon their country of study, due to the significant differences between Spanish and English students in five of the seven VLE contextual factors.*

KEY WORDS: Virtual learning environment (VLE), e-learning, technology-enhanced learning, accounting education

1. Introduction

Traditionally, active learning takes place solely through face-to-face interaction between the tutor and the learner. Today, however, the rapid growth in the adoption of Information and Communication Technology (ICT) impacts upon the way in which educators teach

and students learn (Wells, De Lange and Fieger, 2008), as various educational institutions utilise computer or electronic tools and techniques in their teaching and learning activities (e-learning systems). In addition, new technologies have continued to change what has been the dominant method of instruction at institutions of higher education, while the use of collaborative technologies, supported by web tools, is also becoming ubiquitous. The adoption of these systems by various educational institutions is born out of the need to adapt to the technological imperative of our modern world and to improve the quality of teaching and learning (Lightner and Olson, 2001; Potter and Johnston, 2006; Peng, 2009).

Teaching is performed in an environment composed of different elements: instructor(s), learner(s), and material resources. However, there has been an increased emphasis on the roles of tutors, learners, and institutional resources in enhancing students' learning experience and overall performance (Halawi, Pires and McCarthy, 2009). E-learning, therefore, is regarded as being a crucial material resource for effective teaching and learning. The term *e-learning* refers to the use of different types of electronic media and ICT in teaching and learning. Thus, it facilitates the relationships between instructors and learners through the use of electronic resources. It is now a recognised method for delivering educational material and has the benefit of enabling students to choose the time, place, and pace of study (Reynolds, Rice and Uddin, 2007).

Virtual learning, according to Stonebreaker and Hazeltine (2004, p. 209), is the delivery of learning through electronic mediation that reduces the gap when the instructor and the learner are separated in either time or place. Therefore, virtual learning environments (VLEs) are, according to Wilson (1996, p. 8), 'computer-based environments that are relatively open systems, allowing interactions and encounters with other participants'. This definition widens the conventional description of the learning environment by adding three further dimensions: technology, interaction and control (Piccoli, Ahmad and Ives, 2001). In addition, Schmidt (2002) advocated four elements necessary for a successful VLE: administration, assessment, content and community. The VLEs to be assessed in this current study fit Wilson's (1996) definition and possess Schmidt's four elements, specified above.

In the literature, VLEs are otherwise referred to as technology-mediated learning, web-enhanced learning, web-based learning, and learning management systems. VLEs are considered to be a form of e-learning because they are used as a two-way communication between students and their tutors, or between different learners. As a form of e-learning system, VLEs can support both blended and online (distance) learning. However, for the purpose of this study, a VLE is considered to be an ICT-enabled system providing support to face-to-face learning for on-campus students. It is used to provide lecture notes and presentations (before and after the actual face-to-face lectures), additional learning materials, assignments, feedbacks, useful web links, grades, discussion boards, and communication among students (and with tutors), among others (Halawi, Pires and McCarthy, 2009). Examples of VLEs currently used in various educational institutions are Blackboard, WebCT, Moodle, Desire2Learn and eCollege. Nevertheless, as a result of the fact that the term e-learning is more comprehensive than the term VLE, literature on the former is more commonly found.

Womble (2008) emphasised the need for exploratory research efforts in order to determine the usefulness of e-learning systems. This need is further emphasised by higher education institutions' gradual movement away from the information transfer mode towards a more student-centred learning focus (Potter and Johnston, 2006) that adopts a blended learning approach, a combination of traditional face-to-face teaching methods and e-learning systems.

This current study investigates the perceived usefulness of the VLE as an augmenting tool to enhance face-to-face learning approaches within the context of accounting education at undergraduate level. In the two European universities from which research data were collected, VLEs are used to provide module information, lecture notes, assignments, feedbacks, useful web links, grades, discussion boards and online discussions, making announcements, submitting and grading assignments, accessing results and feedbacks, among others. The study also presents a comparative analysis between accounting students from two universities (in Spain and England) in relation to their use of the VLE and its perceived usefulness in their learning activities, using the contingency theory of education, a novelty in e-learning research. It also considers students' preference for the VLE compared to face-to-face learning and the factors influencing this preference. The remainder of this paper is organised as follows. In the next section, the theoretical framework adopted in the study is discussed. Section 3 presents a review of previous literature on technology-enhanced learning. The fourth section discusses the research design and methods, while the fifth section presents and discusses the results of the study's findings. Section 6 highlights the implications of the findings for accounting education, and the concluding section presents a summary of the study, its limitations and likely areas for future research.

2.   Theoretical Framework: The Contingency Theory of Education

Contingency theory was adopted in the realm of education research as far back as the late 1960s (Derr and Gabarro, 1972). Hitherto, the theory had been a pure organisational theory used to explain organisational differentiation and integration through environmental factors (Lawrence and Lorsch, 1967). In the context of an organisation, the theory discourages managers from searching for universal solutions and peddling panaceas (Wood, 1979). Drawing on this notion, Goodnow (1982, p. 341) developed a conceptual framework for determining the appropriateness of various educational methodologies, which will discourage educators from switching from one methodology to another 'and recognize that the best methodology is contingent upon the circumstances'.

Contingency theory has been adopted in educational contexts particularly in studying school systems as complex organisations (Derr and Gabarro, 1972). The theory can be used to explain structural and process differences among educational institutions in relation to their operating social, economic and technological environments. Similarly, it is not uncommon to see the theory being adopted in technology-related literature to discuss the relative usefulness and the effectiveness of technology-based systems (Sabherwal and King, 1992; Xiao, Dyson and Powell, 1996; Khazanchi, 2005; Lichtenthaler, 2005; Omoteso, Patel and Scott, 2007).

As this current study seeks to examine the perceived usefulness of technology (VLE) within two educational institutions located in two different European countries, the contingency theory of education is considered the most appropriate framework through which to gain an understanding that the nature of the environment in which an educational institution is situated can have a considerable bearing on learners' perceptions of the usefulness of VLEs. The theory is also used to determine the factors that could influence students' preference for the VLE compared to face-to-face learning.

3.   Literature Review

As noted earlier, there is a paucity of research on the usefulness (or impact) of VLEs on students' learning in the current literature. Rather, there is a greater level of focus on

general e-learning systems compared to VLEs, due to the former being a more comprehensive term. Thus, this section reviews relevant studies that currently exist on the use of e-learning and VLEs in higher education. The review is divided into three areas: studies that compare e-learning with face-to-face-learning, studies that focus on the usefulness of e-learning, and studies that concentrate on the use of e-learning in the accounting subject area. The last subsection explains how the main research questions for the study were derived from the gaps identified in the current body of knowledge reviewed in the three previous subsections.

3.1   *Comparing E-Learning with Face-to-Face Learning*

Henning and Schnur (2009) conducted an empirical study comparing an e-learning system group and a traditional learning system group within medical education. They stated that although both groups exhibit 'a significant knowledge gain' over their entry knowledge, this knowledge gain is, on average, twice as great for the e-learning group than for the traditional learners. Besides, none of the participants studying through the computer failed their Continuing Medical Education test, whereas the failure rate for those learning from printed matter averaged 20%. In addition, the objective measurement was supplemented by a subjective self-assessment of the participants, lending support to the conclusion that e-learning has a higher efficiency. Similarly, focusing on Business and Engineering students of an American university, Anitsal *et al*. (2008) investigated the role of personality traits in evaluating the course attributes of online courses and traditional face-to-face courses. Anitsal *et al*. (2008) concluded that, while online students were more emotionally stable, on-ground students were more extroverted. Nevertheless, the generalisability of Henning and Schnur's (2009) and Anitsal *et al*.'s (2008) conclusions is debatable in the light of other similar studies. For example, Piccoli, Ahmad and Ives (2001) investigated the effectiveness of a web-based VLE in basic IT skills training in undergraduate education and found that, compared to the traditional face-to-face method, there were no significant differences between students' performance and satisfaction levels under the two methods.

Furthermore, based on the views of a cross-section of MBA students and graduates at an American university, Drago *et al*. (2005) attempted to dispel some myths relating to e-learning within the context of online education. These myths include: student isolation, a high propensity to drop out, the difficulty of developing certain skills online, a lack of appropriate learning styles, and the lack of appropriate teaching styles. In dispelling these myths, they concluded that the quality and effectiveness of online education is similar if not higher than the traditional face-to-face system. However, in order to determine critical success factors in online education, Volery and Lord (2000) surveyed 47 online management course students using the WebCT in an Australian university. The study identified three factors – technology (ease of access and navigation), the instructor (competence and attitude), and students' previous experience of technology use – as being critical to the success of online education. In addition the study concluded that 'the lecturer will continue to play a central role in online education, albeit his or her role will become one of a learning catalyst and knowledge navigator' (Volery and Lord, 2000, p. 216).

3.2   *The Usefulness of E-Learning*

Some earlier writers on e-learning have focused on the role of certain psychological factors in the assessment of e-learning tools. These factors included students' cognitive need (Peng, 2009), attitudes and perceptions (Tanner, Noser and Totaro, 2009). Based

on responses from 61 Financial Accounting students in an American university, Peng (2009) examined the effects of students' cognitive need, computer efficacy and perception on their performance in an online accounting homework system. Peng's study found that learners' intrinsic motivation and computer efficacy do determine their perception of the usefulness of online homework systems in an accounting course. Also, within the context of two other American universities, Tanner, Noser and Totaro (2009) compared the attitudes and perceptions of business faculty members and those of their undergraduate students in relation to online learning. Tanner, Noser and Totaro's study found differences in the perceptions of the two groups (as students' perceptions are significantly more favourable than those of faculty members), and recommended that institutions planning to adopt online learning should derive some guidance from these findings in order to maximise the outcomes of students' online learning experience.

Nevertheless, the effectiveness of the e-learning method has been widely debated. For example, Gormley *et al*. (2009) stated that the effectiveness of e-learning has been difficult to quantify and that there have been concerns that such educational activities may be driven more by novelty than pedagogical evidence. According to Gormley *et al*. (2009), it is necessary to reflect on this issue while identifying the strengths and weaknesses of this system for possible future improvements. Along the same line of argument, Love and Fry (2006) stated that, if it is accepted that there is a need to incorporate new technologies into the classroom, virtual or otherwise, it is critical to consider their impact on the teaching-learning environment from the students' perspectives. The following represent some of the positive consequences of using virtual resources for teaching, as obtained from the current literature.

First, the relationship between instructors and learners becomes more individual. The use of e-learning allows individual contact with the instructor through the use of specific software (e.g. WebCT, Moodle, Blackboard, etc.). In the same way, it becomes easier for the learner to access online tutorials. For example, McKeough (2009) indicated that online tutorials give learners more time to read the necessary texts in a flexible way. Feedback between instructors and learners is also increased. The instructor can give formative assessment feedback, which impacts upon the quality of the final output (summative assessments). Secondly, distance problems are eliminated as virtual teaching permits learners to listen to the lectures, thereby removing the need to attend classes completely (Sawaan, 2006; Chattopadhyay and Sumrall, 2007).

Thirdly, e-learning improves the flexibility of working hours for both students and teachers, as they are able to manage their time more effectively. They can decide how and when to carry out their activities and take greater control of their own learning outside class time (Potter and Johnston, 2006). Sometimes, as a consequence of flexible working hours, students can combine study and paid employment and thus obtain the job experience necessary to enhance their curriculum vitae and career development. In addition, Hameed *et al*. (2007) examined the effectiveness and efficiency of e-learning systems when operated in a web platform environment such as VLEs and concluded that such systems offer 'the most flexible and scalable route to e-learning'.

Fourthly, learners assume a more active role. Learners are not only recipients of information, as usually happens in traditional face-to-face lectures, but they also take an active part in the learning process. So, although a 'virtual experience' does not replace the efficacy of live learning experiences, the combination of media, including video, interactive and content constructed in a carefully considered environment, offers opportunities to improve the learning experiences for students in large cohorts (Stanley and Edwards, 2005).

Fifthly, teaching costs can be reduced, as the reduction in the number of key lectures decreases the costs of electricity, maintenance and materials, among others (Lightner and Olson, 2001; Sawaan, 2006; Halawi, Pires and McCarthy, 2009). Finally, other benefits of VLEs in the literature include improving learners' achievements and attitudes towards learning (Hiltz, 1995; Maki *et al*., 2000) and improving learners' evaluation of their learning experience (Alavi, 1994).

A combination of all these positive consequences will culminate in improved learning quality. However, the use (or, perhaps sometimes, the abuse) of virtual resources for teaching can also lead to the following negative consequences, as suggested by previous studies. First, the teaching relationship between instructors and learners can become impersonal. There is not a face-to-face relationship because all the contact is through the computer, so the relationship becomes colder. In many cases, learners prefer a combination of face-to-face education and online learning (Reynolds, Rice and Uddin, 2007; Braeckman, Fieuw and Van Bogaert, 2008). In the absence of such a combination, e-learning tends to lead to learners' feelings of isolation due to the absence of 'elements of immediacy' such as eye contact, smiling and vocal expressions (Brown 1996; Handy, 2005), learners' feelings of frustration, anxiety and confusion (Hara and Kling, 2000) and learners' reduced interest in the subject matter (Maki *et al*., 2000).

Secondly, technical failures can sometimes occur. It is a reality that computers do not work all the time. This could be due to a software problem, a connection problem or the unavailability of log on access to the Internet. In this case, normally, it is necessary to wait for the problem to be solved. In a research study conducted by Lightner and Olson (2001), students expressed concern that there were still cases of disrupted video or audio connections, and some students explicitly identified 'technical problems' as being a difficulty.

Thirdly, passive attitudes on the part of the learner can be encouraged. Students need to be motivated in order to increase their attention in the room, to ask questions of the teacher, to work in groups, and to learn effectively. Thus, e-learning students need to be self-directed and motivated and to display sufficient self-discipline. For this reason, many investigations consider students' participation and motivation as being an important factor for e-learning success (Rao and Walsh, 2000; Love and Fry, 2006; Hussin, Bunyarit and Hussin, 2009). Finally, e-learning can lead to an inadequate pedagogical structure, which will result in a compulsory learning situation. A compulsory learning situation occurs when a technology is designed to support a specific learning model that may not be congruent with the learner's epistemological beliefs about how learning should occur (Vermunt, 1998).

Despite the above negative consequences, Jalobeanu (2003) stated that some identified obstacles, such as those relating to management, technology, communication and expense, can all be overcome to create a powerful learning environment. Jalobeanu (2003) emphasised that instructors must understand that it is their hard work and engagement that will be necessary to overcome these obstacles. In the same way, Wolfe (2001) advocated that teaching on the web is an art and that only by applying hard work, rigorous research, and imagination to that art will we create a world class World Wide Web. Similarly, and, more specifically, Handy (2005) emphasised the need for alternative teaching methods in accounting that could include simulations and the creative use of technology. According to Handy (2005, p. 18), 'when evaluating these new methods of presenting accounting concepts, accounting educators should consider instructional methods' impact on students' learning, as well as students' perception of their learning'.

3.3   *E-Learning in Accounting*

In the wake of these new developments, different researchers have focused their efforts on the use and/or impact of e-learning on certain business subjects/courses. Examples of such subjects include Marketing (Hansen, 2008); Operations Management (Greasley, Bennett and Greasley, 2004); MBA Statistics (Grandzol, 2004); and International Business Education (Smith and Duus, 2001). However, very few studies are available in the current body of literature on e-learning and accounting (see Handy, 2005; Love and Fry, 2006, Anakwe, 2008; Wells, De Lange and Fieger, 2008). For example, Handy (2005) found a positive learning experience from students learning financial accounting through computerised tutorial systems. Using a variety of qualitative techniques to obtain data from students at an American university, Handy identified the significance of students' attitude towards computer-based learning and their perception of 'social presence' in computer-mediated learning methods.

Similarly, Love and Fry (2006) argued, based on data from UK first-year accounting undergraduates, that students perceived tutors to be using the VLE as an 'online textbook' or a 'safety net' rather than a supplementary tool to add value to their learning. Also, based on data collected from undergraduate accounting students in New Zealand, Wells, De Lange and Fieger (2008) examined accounting students' use of the VLE (the Blackboard) as a learning aid. The study's findings indicated that, although students were enthusiastic about the use of the Blackboard, they were not yet ready to engage in two-way online activities.

Basioudis and de Lange (2009) examined the impact of VLE's design features (such as announcements, delivery of lecture notes, online assessments, and online chats) on the teaching and learning effectiveness of undergraduate accounting students. The study found that undergraduate accounting students' participation and mental efforts (as subsets of motivation) in the learning process are enhanced by these design features. The students were also found to be satisfied with the design features. Similarly, in a cross-country study that involved undergraduate accounting students from Australia, New Zealand and the UK, Basioudis *et al.* (2012) assessed the perceptions of students on the design features of two types of VLEs (the Blackboard and the WebCT) in teaching undergraduate accounting students in the three countries. The study concluded that, regardless of cultural differences inherent in their different countries of study, students are satisfied with the use of VLEs, particularly in the aspects of lecture notes, bulletin boards and discussion forums.

3.4   *Research Questions*

It can be observed from the foregoing review of relevant literature that there is a dearth of research on the use of e-learning and VLEs in accounting as a discipline. Available studies that focused on accounting have only considered financial accounting modules taught at either first- or second-year undergraduate levels (Handy, 2005; Basioudis and de Lange, 2009; Basioudis *et al.*, 2012). However, final-year accounting students are expected to have the richest experience of VLEs, having used these tools throughout their undergraduate studies, and responses from this group of students are expected to produce better quality results compared to those from first- and second-year students. Hence, this current study assesses final-year accounting students' perceptions of the use of VLEs in all their accounting modules.

Furthermore, as noted earlier, Peng's (2009) study examined the effects of students' cognitive need, computer efficacy, and perceptions on their performance, but his study merely focused on an online accounting homework system rather than on the entire e-learning

system of a group of accounting students. The current study therefore examines how final-year undergraduate accounting students' use of VLEs impacts on their cognitive skills. For the purpose of this study, cognitive skills are interpreted in the light of the six categories of Bloom's 1956 cognitive taxonomy (which comprises knowledge, comprehension, application, analysis, synthesis and evaluation) within accounting education. Finally, this study adopts the contingency theory of education to evaluate the perception of VLE use in several areas of accounting by students studying in two European countries, Spain and England. Specifically, the study aims to answer the following key research questions (RQs).

RQ1: Is the perception of the usefulness of VLE different between undergraduate accounting students in Spain and those in England?

RQ2: Do certain contextual factors influence undergraduate accounting students' preferences between learning through VLE facilities and face-to-face learning?

To be able to provide answers to these research questions, appropriate data collection and analysis methods were developed and applied. These methods are presented in Section 4, below.

4.   Research Design and Method

Spain and England were selected for this study because the two countries' levels of technological development as well as accounting education are similar. Evidence from the literature indicates that both Spanish and English universities have adopted VLEs in their teaching and learning activities (see Greasley, Bennett and Greasley, 2004; Love and Fry, 2006; Gonzalez and Hassall, 2009). Also, Accounting is being studied at degree levels in both countries. The students used in this research were final-year undergraduate students studying for a degree in Accounting in both University A in Spain and University B in England during the 2009/2010 academic session. The final-year students were chosen because they would have taken the maximum number of accounting modules possible at the time of collecting the data.

In both the English and Spanish universities from which research data were collected, VLEs were used as complementary tools to enhance the wider teaching-learning environment. The two universities provide a VLE (in the forms of WebCT in University A and Blackboard in University B) for all the modules on all the programmes they run. These facilities are accessible to all teaching staff and students through their unique usernames and passwords. In the two European universities VLEs are used to provide module information, lecture notes, assignments, feedbacks, useful web links, grades, discussion boards and online discussions, making announcements, submitting and grading assignments, accessing results, and feedbacks, among others.

The study adopted a quantitative approach to data collection and analysis. A questionnaire was designed, based on the research objectives and drawing on the research instruments used in similar previous studies by Volery and Lord (2000) and Halawi, Pires and McCarthy (2009), which were administered in Australia and the USA, respectively. The questionnaire was piloted with a selected group of final-year undergraduate accounting students in both universities and, based on the outcome of this pilot study, the questionnaire was fine-tuned to enhance its clarity and effectiveness. The final questionnaire (see Appendix) contained 44 items (questions) under six sections, as shown in Table 1.

The section on demographic information was included in order to examine the background characteristics of the sample. Items included under this section were respondents' gender, age and university of study, and these items were used as independent variables to determine whether or not differences in students' characteristics may affect their responses to other items in the questionnaire.

Table 1.   Structure of the questionnaire.

	Section	No of items
1	Demographic information	6
2	Internet use and facilities	8
3	E-learning use	6
4	Course content and user interface	11
5	E-learning and cognitive skills	6
6	Comparison between e-learning and face-to-face learning	7
	Total	**44**

The eight items in the second section of the questionnaire (on Internet use and facilities[1]) were included for two main purposes. Firstly, to determine students' mode and level of access to the Internet and the VLE. Secondly, these variables can also be assessed to determine the impact they could have on students' responses to other items in the questionnaire. Items in Sections 3, 4 and 5 were respectively designed to assess the ease of use, the usefulness of features and cognitive enhancement to accounting students, while the items contained in Section 6 were intended to compare students' preference between VLE and face-to-face learning. All the questions, except three in the section on demographic information, were designed as fixed alternative questions using mainly a five-option Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree).

To collect research data for this study, a purposeful sampling technique was used, focusing on undergraduate students with a wide range of experience of the VLE (final-year students) within a specific subject, Accounting. The modules with the highest number of accounting students were the prime targets in both institutions. Permissions were sought from appropriate authorities in both universities prior to the distribution of the questionnaire. Students' consent was also sought. Furthermore, before the data collection exercise commenced, students were briefed on the purpose of the questionnaire and how it should be completed. They were told that their names were not required and were also assured that their responses would be treated in the strictest confidence. With the co-operation of the tutors concerned in both institutions, the questionnaires were distributed within the second half of classes while students completed and returned them prior to dispersing from the class. A sample of 221 students was drawn for the study, of which 200 were usable, 100 from each of the two participating institutions.

5.   Analysis and Discussion of Results

This section presents and discusses the study's findings in two parts. In the first part, a descriptive analysis of the 'demographic information' and 'Internet and VLE use' is undertaken and discussed, while, in the second part, a factor analysis of the main themes of the questionnaire is carried out.

5.1   *Descriptive Analysis*

This subsection contains a descriptive analysis of two groups of variables included in the questionnaire (see Appendix, Section 1 and the first part of Section 2). The purpose of analysing the 'demographic information' is to determine the characteristics of participants, while the purpose of analysing data on 'the Internet use and facilities' is to assess students' mode and level of access to the Internet and VLE.

5.1.1   *Demographic information.*   A total of 200 students participated in this study, with 50% of them being based in England and 50% being based in Spain. Similarly, 50% of the respondents were men and 50% were women, while the majority of the participating students (80%) were in the age range 21–25 years. Also, only 13% of all the respondents in both countries were overseas students. For this reason the variable 'Class of Studentship' was not analysed further. These demographic distributions show a geographic and gender balance in the research subjects. The age range is not unexpected as respondents are all final-year accounting students in their respective institutions.

Halawi, Pires and McCarthy's (2009) study could not find a relationship between individual factors (such as age and gender) and a student's learning process through the VLE. Also, according to Stonebreaker and Hazeltine (2004), results from the current body of literature on VLEs are mixed and inconclusive on age and gender. Similarly, in our study, age and gender were initially incorporated into the statistical analysis, but these two variables didn't produce any significant differences. As such, this study will not dwell on these two variables. However, the study will be exploring, through the contingency theory of education, the possibility of students' country of study affecting their perception of the usefulness of VLEs in their study of accounting.

5.1.2   *Internet and VLE use.*   Nearly all students (99%) access the Internet from both home and campus. On average, the number of hours they spend on the Internet exceeds six hours per week in 83% of cases, with 33% spending more than 16 hours a week online. However, the number of hours spent on the VLE is much lower, with 81% using it for a maximum of five hours a week. Finally, the study's results show that only 2% have been using the VLE for more than five years. This indicates that most of the responding students only started to use VLE when they began their university studies. As such, VLEs seem to have been unavailable at college level in both countries. Nevertheless, the result does not show any significant difference between the two countries when it comes to the variables contained in this section of the questionnaire.

5.2   *Factor Analysis*

For the purpose of analysis, 34 questionnaire items[2] were divided into five sections and summarised into nine underlying factors (see Table 2). A factor analysis was used to

Table 2.   Component factors from the questionnaire.

Section of the questionnaire	Factors	Items in the questionnaire (see Appendix)
2[a] Internet facilities	1. Internet and VLE facilities	2e/2f/2g/2h
3[a] VLE use	2. Learning characteristics	3c/3d/3e/3f
	3. Relationship with the teacher	3a/3b
4[a] Course content and user interface	4. Utility of complementary assistance	4f/4g/4h/4i/
	5. Satisfaction and performance	4c/4j/4k
	6. Ease of use/usefulness of VLE	4a/4b/4d/4e
5[a] VLE and cognitive skills	7. Skills and knowledge	5a/5b/5c/5d/5e/5f
6[a] Comparison between VLE and face-to-face learning	8. Preference for the VLE as opposed to face-to-face learning	6a/6d/6e/6f/6g
	9. Joint preference for the VLE and face-to-face learning	6b/6c

construct these latent factors and, on the basis of a principal components analysis, all factors with eigenvalues greater than one were selected. After the selection, a varimax rotation was used to establish the most dominant elements in each of these factors.

Each of the nine factors in Table 2 is defined as follows:

Factor 1 – Internet and VLE facilities: This factor includes items relating to the facilities available to students that enable them to use the internet and the VLE.

Factor 2 – Learning characteristics: This factor comprises items that relate to: e-learning improving the structure of students' learning, learning through the VLE being an enjoyable way of learning, the VLE as a motivational means of learning, and the VLE being a particularly suitable medium to study accounting modules.

Factor 3 – Relationship with the teacher: This factor covers items that focus on areas such as e-learning's ability to enhance students' interaction with their teachers and the quality of the feedback they receive from these teachers.

Factor 4 – Utility of complementary assistance: This factor consists of questions relating to the usefulness of the VLE facilities (such as email, discussion boards, blogs and module evaluation) for students' interaction with their fellow students and tutors.

Factor 5 – Satisfaction and performance: Items included in this factor are the usefulness of VLE materials to students, students' overall satisfaction with VLE facilities and the overall effects of the VLE system on students' academic performance.

Factor 6 – VLEs' usefulness/ease of use: This factor comprises items that focus on technological difficulties being encountered by students while using the VLE system, students' ease of navigating the VLE system, usefulness of VLE for accessing results, and the usefulness of using the email facility for contacting their teachers.

Factor 7 – Skills and knowledge: This factor comprises items that focus on areas such as the effects of the VLE on students' knowledge base, comprehension ability, problem-solving skills, analytical skills, ability to synthesise ideas and ability to evaluate issues.

Factor 8 – Preference for the VLE as opposed to face-to-face learning: Items included in this factor are students' level of preference for the VLE, whether they believe the VLE is an easier way for them to communicate with their fellow students, whether students think they learn more effectively and efficiently with the VLE system, whether students perceive the VLE system to be a faster means of learning, and whether students consider the VLE to be a more motivational system of learning.

Factor 9 – Joint preference level for the VLE and face-to-face learning: This factor includes questions relating to students' preference for a mix of both VLE and face-to-face learning systems and students' ease of communication with their teachers through the VLE.

The foregoing factors (variables) were created using the weighted linear combinations of the items. This made it possible to analyse potential relationships between responses and the influence that students' country of study may have on their experiences. Further analyses were carried out using the *t*-test and Pearson correlation co-efficient to examine the relationships.

In order to assess students' perceptions of the usefulness of the VLE in accounting education, the above nine factors were grouped into two:

- Factors 1 to 7 (contextual factors): These are factors that define the context of learning through the VLE.

- Factors 8 to 9 (preference factors): These are factors that define preferences between VLE and face-to-face learning.

5.2.1   *Relationships between contextual factors and students' country of study.*   In this section, the study seeks to find out if the contextual factors relating to the use of VLEs are perceived differently by the students studying in the two countries. The following hypothesis is proposed:

> H0: There are no differences in the perception of contextual factors between students based in Spain and those based in England.
> H1: There are differences in the perception of contextual factors between students based in Spain and those based in England.

It can be observed from the students' t-statistics in Table 3 that significant differences exist between the two countries in all but two factors: 'The Internet and VLE facilities' and 'Utility of complementary assistance'.

The values contained in Table 3 show that students based in Spain attach greater importance to the relationship with their teacher through the VLE (Factor 3) and to the usefulness of the VLE (Factor 6) than students based in England. On the other hand, students based in England value more the VLE characteristics (Factor 2), satisfaction and performance (Factor 5), and skills and knowledge (Factor 7) than those based in Spain.

The significant differences observed in the remaining five out of seven contextual factors may be attributable to the differences in regulations and policies of the recognised agencies in charge of higher education and the accounting profession in both countries. According to Gonzalez and Hassall (2009), pressures exerted by external institutional constituents on the Spanish higher education system in a bid to implement the European Higher Education Area in Spain have had impacts on Spanish accounting education. Such pressures may be a contributing factor to the differences observed between the two countries in this current study.

The foregoing results and discussions further entrench the relevance of the contingency theory of education to this study. The theory advocates that the extent of the usefulness or perceived importance of educational methodologies such as the VLE may not be the same

Table 3.   Comparative test of mean values between countries.

	Country	Mean	*t*	*p* value
Factor 1: Internet and VLE facilities	Spain	−0.1	−1.42	0.156
	England	0.1		
Factor 2: Learning characteristics	Spain	−0.25	−3.71	**0.000****
	England	0.25		
Factor 3: Relationship with the teacher	Spain	0.27	3.99	**0.000****
	England	−0.27		
Factor 4: Utility of complementary assistance	Spain	0.068	0.96	0.337
	England	−0.068		
Factor 5: Satisfaction and performance	Spain	−0.24	−3.53	**0.001****
	England	0.24		
Factor 6: Usefulness of use of VLE	Spain	0.30	4.47	**0.000****
	England	−.030		
Factor 7: Skills and knowledge	Spain	−0.22	−3.16	**0.002****
	England	0.22		

**Significant values at $p < 0.01$.

Table 4.   Correlations between contextual factors and preference factors.

	Preference factors	
	Factor 8: Preference for the VLE as opposed to face-to-face learning, Pearson correlation co-efficient (*p* value)	Factor 9: Joint preference for the VLE and face-to-face learning, Pearson correlation co-efficient (*p* value)
Contextual factors		
Factor 1: Internet and VLE facilities	0.153 (**0.031**)*	0.081 (0.255)
Factor 2: VLE characteristics	−0.004 (0.950)	0.292 (**0.000**)**
Factor 3: Relationship with the teacher	0.157 (**0.027**)*	0.189 (**0.007**)**
Factor 4: Utility of complementary assistance	0.129 (0.069)	0.048 (0.504)
Factor 5: Satisfaction and performance	−0.207 (**0.003**)**	0.085 (0.232)
Factor 6: Usefulness of use of VLE	0.277 (**0.000**)**	0.118 (0.097)
Factor 7: Skills and knowledge	1 (0.153)	0.000 (1)

*Significant values at $p < 0.05$.
**Significant values at $p < 0.01$.

in two (or more) different environments (for example, Spain and England). Therefore, in this study, students' country of study is considered a strong contingent factor that determines their perceptions of the usefulness of a VLE. Although previous studies on VLEs and e-learning have not applied contingency theory directly in their research, some of their conclusions support this theory. For example, Handy (2005) submitted that the setting of the learning might contribute to the perceptions of the usefulness of the technology. Similarly, Piccoli, Ahmad and Ives (2001) concluded that the outcome of e-learning is a function of the instructional implementation of the technology rather than the technology itself.

5.2.2   *Relationships between contextual factors and preference factors.*   In this subsection, the influence of the factors that define the context of the VLE (Factors 1 to 7) on the factors that define students' preference for a particular type of learning (Factors of 8 and 9) is determined. For this purpose, the following hypotheses (stated in the null form) are proposed:

   H0: Contextual factors do not influence students' preference for the VLE.
   H0: Contextual factors do not influence students' joint preference for both the VLE and face-to-face learning

Table 4 shows the correlations between the objective variables (Factors 8 and 9) and the remaining factors, measured by means of the Pearson correlation coefficient.
   From the results presented in Table 4, the following conclusions can be drawn:

● *There is a higher level of preference for the VLE as opposed to face-to-face learning (Factor 8).*

This preference is higher when students' perceptions of certain contextual factors are better. In other words, the better the access to Internet and VLE facilities (Factor 1), the better the students' perceptions of their relationship with their teacher (Factor 3) and the higher their evaluation of the usefulness of the VLE (Factor 6).

- *There is a high level of joint preference for the VLE and face-to-face learning (Factor 9).*
  In this case, the higher the students' evaluation of the VLE learning characteristics (Factor 2), the better their perceptions of their relationship with their teacher (Factor 3) and the higher their joint preference for the VLE and face-to-face learning approaches.

5.2.3   *Comparison between the two preference factors.*   Finally, the study investigated whether students would prefer the VLE as opposed to face-to-face learning (Factor 8) or whether they would prefer a mix of the VLE and face-to-face learning (Factor 9). This is studied both in general (for the sample as a whole) and for each of the two countries. To carry out this analysis, it was necessary to obtain the values of Factors 8 and 9 without standardising (Factor 8a and Factor 9a). Therefore, starting from the original Factors 8 and 9, two new factors are created as weighted means of the items involved in their construction, using the associated factorial weights.

In this way, after obtaining the necessary data, the following hypotheses (stated in the null form) are proposed:

Total sample

> H0: There are no significant differences between the two preference factors (without standardising Factors 8a and 9a).

Country of study

> H0: There are no significant differences between the two preference factors (without standardising Factors 8a and 9a) and the country of study.

From Table 5 it can be seen that there are statistically significant differences in the preference for the type of learning described by Factors 8a and 9a. For the full sample, there are significant differences between the two factors, suggesting that students tend significantly towards the VLE. Similarly, when the sample is divided between the two countries, the conclusion is the same, as, both in Spain and in England, there is a preference towards the provision of more VLE facilities. This result implies that the underlying environmental (contingent) preference factors present in both Spain and England are similar.

Furthermore, these results (see Table 4) show that accounting students from both countries find VLEs and Internet facilities to be useful for their studies ($r = 0.277$; $p = 0.000$); enhancing their relationship with their teachers ($r = 0.157$; $p = 0.027$); and improving their academic performance ($r = -0.207$; $p = 0.003$). These findings lend credence to Alexander's (2001) identified factors for determining the quality of students' experience in a blended learning system: communication and support from tutors and other students, and students' own level of experience and expertise with ICT. Similarly, these findings strengthen those of Basioudis and de Lange (2009), who found that undergraduate accounting students' participation and mental efforts in the learning process are enhanced by VLE design features.

In addition, this study's results corroborate those of Handy (2005), who found an equally positive learning experience from students studying financial accounting through computerised tutorial systems. The results also support those of Wells, De Lange and Fieger (2008), who concluded that New Zealand's accounting undergraduates

Table 5.   *t*-test for dependent samples of standard preference factors.

	Factor 8a. : Preference for the VLE as opposed to face-to-face learning	Factor 9a. Joint preference for the VLE and face-to-face learning
Total sample		
Mean	3.264	2429
Related differences	0.835	
t (*p* value)	11.8 (**0.000**)**	
Spain		
Mean	3.310	2138
Related differences	1.172	
t (*p* value)	11.955 (**0.000**)**	
England		
Mean	3.217	2720
Related differences	0.497	
t (*p* value)	5.490 (**0.000**)**	

**Significant values at $p < 0.01$.

have fully embraced and are happy with the VLE in their learning activities. Added to these, this study's results add to the earlier findings that support and advocate the importance of VLEs in higher education (Alavi, 1994; Stanley and Edwards, 2005; Hameed *et al.*, 2007; McKeough, 2009).

Nevertheless, this study's results negate Gormley *et al.*'s (2009) assertion that the usefulness of e-learning is difficult to quantify and that there have been concerns that the use of e-learning may be driven more by novelty than pedagogical evidence. Similarly, the results run contrary to Love and Fry's (2006) findings, which suggested that accounting students perceived the tutor's use of the VLE 'simply as an online textbook'. Although Love and Fry's study was carried out in the UK, the difference between its findings and those of the current study may be attributable to the time lag between the two studies. Perhaps, Love and Fry's study was conducted when the use of VLE was relatively new to UK institutions, as alluded to in the work of Greasley, Bennett and Greasley (2004). Besides, there should be a considerable difference between VLE usage by first-year students (who are considered new to higher education), as used in Love and Fry's study, and final-year students' VLE usage, as assessed in this current study.

6.   Implications of the Study's Findings for Accounting Education

The findings of this study present certain implications for accounting education. First, VLE characteristics identified in the study (which include structure of and motivation for learning) constitute important factors for accounting students' skills, knowledge and overall academic performance. Hence, accounting educators should ensure that these characteristics are adequately considered in current and future teaching and learning systems. These factors relate to cognitive development in accounting education at undergraduate level. However, given that the major criticism of accounting education, particularly in Spain, has been the lack of development of personal and interpersonal skills (Gonzalez and Hassall, 2009), it is expected that an increase in the use of VLEs in undergraduate accounting education should contribute to solving this issue.

As the accounting profession begins to place a higher level of emphasis, more than before, on information interpretations rather than on ordinary data manipulations, it is believed that the use of VLEs could further be expanded in order to enhance the interactions between accounting students and lecturers, a necessity for deeper learning. The significance of VLEs in accounting education (as demonstrated in this study's findings) requires that accounting educators should ensure a continuous improvement in the ease of use of VLE tools and techniques for effective learning.

Furthermore, the study's findings reveal that the extent of application of VLE should be contingent upon the prevailing environmental and technological circumstances of the universities in which students are based, as these will have a direct and significant bearing on their level of use and perceived usefulness. In addition, as students tend to seek to make greater use of VLE facilities in their learning while educational institutions dwell on environmental and financial considerations, this may lead to an 'expectation gap', as students' hopes may not match their institutions' abilities and inclinations.

7.   Conclusions

As higher education institutions continue to utilise electronic and web tools and techniques in their teaching and learning activities, this study reviews the current body of literature on the benefits and drawbacks of e-learning and VLEs. It also examines the literature on the application of VLEs within the context of e-learning, in business education generally and in accounting in particular, with a view to contributing to knowledge and practices in accounting education. In order to achieve the study's aim of assessing undergraduate accounting students' perceptions of VLE facilities on their learning experiences, data were collected from final-year undergraduate accounting students from Spain and England regarding their use of VLE. Through the framework of the contingency theory of education, the study found that, although accounting students in general are eager for more VLE provisions to enhance their learning experience, students' perceptions of the usefulness of VLE systems is strongly dependent upon their country of study, due to the significant differences between students based in Spain and those based in England in five out of the seven VLE contextual factors. These five contextual factors are: students' perceptions of their relationship with their teachers through the VLE, the perceived ease of use of the VLE, the perceived usefulness of VLE characteristics, students' satisfaction with the performance of the VLE, and their perceptions of VLEs' contribution to their accounting knowledge and skills.

Despite these findings, care should be taken in interpreting the study's results, as a more robust study that is longitudinal in nature or involving a higher number of institutions from various countries with a similar level of technological advancement may provide more generalisable findings. It is possible that the study might have benefited more from a triangulation approach that combined the quantitative data with some interviews or observations. Areas of focus recommended for future research include assessing the effects of VLEs on accounting graduates' performance in professional examinations subsequent to their graduation, and examining VLEs' impact on the learning experience of distance learning accounting students.

Acknowledgements

Notes

[1]Section 2 of the questionnaire is divided into two parts. The first part (items 2a–2d) was analysed by a descriptive analysis and the second part (items 2e–2h) was integrated into a factor analysis.

[2]Demographic variables and Internet use variables (items 1a–2d) are excluded from factor analysis because they have been examined by descriptive analysis in the previous section.

References

Alavi, M. (1994) Computer-mediated collaborative learning: an empirical evaluation, *MIS Quarterly*, 18(2), pp. 159–174.

Alexander, S. (2001) E-learning developments and experiences, *Education and Training*, 43(4/5), pp. 240–248.

Anakwe, B. (2008) Comparison of student performance in paper-based versus computer-based testing, *Journal of Education for Business*, 84(1), pp. 13–17.

Anitsal, M. M., Anitsal, I., Barger, B., Fidan, I. and Allen, M. R. (2008) Student evaluations of course attributes of online courses versus on-ground courses: impact of student personality traits, *Allied Academies International Conference. Academy of Marketing Studies Proceedings*, 13(1), pp. 1–8.

Basioudis, I. G. and de Lange, P. A. (2009) An assessment of the learning benefits of using a web-based learning environment when teaching accounting, *Advances in Accounting, Incorporating Advances in International Accounting*, 25(1), pp. 13–19.

Basioudis, I. G., de Lange, P. A., Suwardy, T. and Wells, P. (2012) Accounting students' perceptions of a learning management system: an international comparison, *Accounting Research Journal*, 25(2), pp. 72–86.

Bloom, B. S. (1956) *Taxonomy of Educational Objectives, Handbook 1: The Cognitive Domain* (New York: David McKay).

Braeckman, L., Fieuw, A. and Van Bogaert, H. (2008) A web- and case-based learning program for postgraduate students in occupational medicine, *International Journal of Occupational and Environmental Health*, 14(1), pp. 51–57.

Brown, K. M. (1996) The role of internal and external factors in the discontinuation of off-campus students, *Distance Education*, 17(1), pp. 44–71.

Chattopadhyay, D. and Sumrall, D. (2007) E-learning in a multicultural environment using a publicly available internet platform: case study of an USA – Ukraine university partnership, *Journal of Global Business Issues*, 1(1), pp. 35–42.

Derr, C. B. and Gabarro, J. J. (1972) An organizational contingency theory for education, *Educational Administration Quarterly*, 8(2), pp. 26–43.

Drago, W., Peltier, J. W., Hay, A. and Hodgkinson, M. (2005) Dispelling the myths of online education: learning via the information superhighway, *Management Research News*, 28(7), pp. 1–17.

Gonzalez, J. M. G. and Hassall, T. (2009) The changes to accounting education and accounting educators as a result of changes in the Spanish university system: a case study using an institutional theory approach, *International Journal of Management Education*, 7(3), pp. 13–25.

Goodnow, W. E. (1982) The contingency theory of education, *International Journal of Lifelong Education*, 1(4), pp. 341–352.

Gormley, G., Collins, K., Boohan, M., Bickle, I. and Stevenson, M. (2009) Is there a place for e-learning in clinical skills? A survey of undergraduate medical students' experiences and attitudes, *Medical Teacher*, 31(1), pp. 6–12.

Grandzol, J. R. (2004) Teaching MBA statistics online: a pedagogically sound process approach, *Journal of Education for Business*, 79(4), pp. 237–244.

Greasley, A., Bennett, D. and Greasley, K. (2004) A virtual learning environment for operations management: assessing the student's perspective, *International Journal of Operations and Production Management*, 24(9/10), p. 974.

Halawi, L., Pires, S. and McCarthy, R. (2009) An evaluation of e-learning on the basis of Bloom's taxonomy: an exploratory study, *Journal of Education for Business*, 84(6), pp. 374–381.

Hameed, S., Mellor, J., Badii, A., Patel, N. and Cullen, A. J. (2007) Factors mediating the routinization of e-learning within a traditional university education environment, *International Journal of Electronic Business*, 5(2), p. 160.

Handy, S. A. (2005) An exploratory study of learners' use of a computerised accounting tutorial, *Information Technology, Learning and Performance Journal*, 23(2), pp. 17–29.

Hansen, D. E. (2008) Knowledge transfer in online learning environments, *Journal of Marketing Education*, 30(2), p. 93.

Hara, N. and Kling, R. (2000) Students' distress with a web-based distance education course: an ethnographic study of participants' experiences, *Information, Communication and Society*, 3(4), pp. 557–579.

Henning, P. and Schnur, A. (2009) E-learning in continuing medical education: a comparison of knowledge gain and learning efficiency, *Journal of Medical Marketing*, 9(2), pp. 156–162.

Hiltz, S. R. (1995) Teaching in a virtual classroom, *International Journal of Educational Telecommunications*, 1(2), pp. 185–198.

Hussin, H., Bunyarit, F. and Hussin, R. (2009) Instructional design and e-learning: examining learners' perspective in Malaysian institutions of higher learning, *Campus Wide Information System*, 26(1), pp. 4–19.

Jalobeanu, M. (2003) The internet in education: the past, the present and, hopefully, the future, in: N. Nistor, S. English and S. Wheeler (Eds) *Toward the Virtual University: International Online Learning Perspective*, pp. 23–36 (Greenwich: Information Age Publishing).

Khazanchi, D. (2005) Information technology (IT) appropriateness: the contingency theory of 'fit' and IT implementation in small and medium enterprises, *The Journal of Computer Information Systems*, 45(3), p. 88.

Lawrence, P. R. and Lorsch, J. W. (1967) Differentiation and integration in complex organizations, *Administrative Science Quarterly*, 12(1), pp. 1–47.

Lichtenthaler, E. (2005) The choice of technology intelligence methods in multinationals: towards a contingency approach, *International Journal of Technology*, 32(3/4), p. 388.

Lightner, S. and Olson, C. (2001) Offering a globally-linked international accounting course in real-time: a sharing of experiences and lessons learned, *Journal of Accounting Education*, 19(4), pp. 247–263.

Love, N. and Fry, N. (2006) Accounting students' perceptions of a virtual learning environment: springboard or safety net? *Accounting Education: An International Journal*, 15(2), pp. 151–166.

Maki, R. H., Maki, W. S., Patterson, M. and Whittaker, P. D. (2000) Evaluation of a web-based introductory psychology course: learning and satisfaction in on-line versus lecture courses, *Behavior Research Methods, Instruments and Computers*, 32(2), pp. 230–239.

McKeough, Z. J. (2009) Emergence of e-learning, *The Australian Journal of Physiotherapy*, 55(1), pp. 69–70.

Omoteso, K., Patel, A. and Scott, P. (2007) Information and communications technology and organisations: a meta-level perspective, *The International Journal of Technology, Knowledge and Society*, 3(3), pp. 19–27.

Peng, J. C. (2009) Using an online homework system to submit accounting homework: role of cognitive need, computer efficacy and perception, *Journal of Education for Business*, 84(5), pp. 263–268.

Piccoli, G., Ahmad, R. and Ives, B. (2001) Web-based virtual learning environments: a research framework and a preliminary assessment of effectiveness in basic IT skills training, *MIS Quarterly*, 25(4), pp. 401–426.

Potter, B. and Johnston, C. (2006) The effect of interactive on-line learning systems on student learning outcomes in accounting, *Journal of Accounting Education*, 24(1), pp. 16–34.

Rao, A. and Walsh, R. (2000) Ways to promote participation in the online introductory accounting courses, *Proceedings of the Academy of Educational Leadership*, 5(1), pp. 61–65.

Reynolds, P., Rice, S. and Uddin, M. (2007) Online learning in dentistry: the changes in undergraduate perceptions and attitudes over a four year period, *British Dental Journal*, 203(7), pp. 419–423.

Sabherwal, R. and King, W. R. (1992) Decision processes for developing strategic applications of information systems: a contingency approach, *Decision Sciences*, 23(4), pp. 917–943.

Sawaan, A. (2006) Studying the implications of hidden learning styles by tracing learners' behaviors in an e-learning system, unpublished dissertation, University of Lousville, Kentucky.

Schmidt, K. (2002) Web-enhanced classroom, *Journal of Industrial Technology*, 18(2), pp. 2–6.

Smith, D. E. and Duus, H. J. (2001) The power of e-learning in international business education, *Journal of Teaching in International Business*, 13(2), pp. 55–72.

Stanley, T. and Edwards, P. (2005) Interactive multimedia teaching of accounting information system (AIS) cycles: students' perceptions and views, *Journal of Accounting Education*, 23(1), pp. 21–46.

Stonebreaker, P. W. and Hazeltine, J. E. (2004) Virtual learning effectiveness: an examination of the process, *The Learning Organization*, 11(2/3), pp. 209–225.

Tanner, J. R., Noser, T. C. and Totaro, M. W. (2009) Business faculty and undergraduate students' perceptions of online learning: a comparative study, *Journal of Information Systems Education*, 20(1), pp. 29–40.

Vermunt, J. D. (1998) The regulation of constructive learning process, *British Journal of Educational Psychology*, 68(2), pp. 149–171.

Volery, T. and Lord, D. (2000) Critical success factor in online education, *The International Journal of Education Management*, 14(5), p. 216.

Wells, P., De Lange, P. and Fieger, P. (2008) Integrating a virtual learning environment into a second-year accounting course: determinants of overall student perception, *Accounting and Finance*, 48(3), pp. 503–518.

Wilson, B. G. (1996) *Constructivist Learning Environments: Case Studies in Instructional Design* (Englewood Cliffs, New Jersey: Educational Technology Publications).

Wolfe, C. (2001) *Learning and Teaching on the World Wide Web* (San Diego: The Academic Press).

Womble, J. (2008) E-learning: the relationship among learner satisfaction, self-efficacy, and usefulness, *The Business Review*, 10(1), pp. 182–189.

Wood, S. (1979) A reappraisal of the contingency approach to organization, *Journal of Management Studies*, 16(October), pp. 334–354.

Xiao, J. Z., Dyson, J. R. and Powell, P. L. (1996) The impact of information technology on corporate financial reporting: a contingency perspective, *The British Accounting Review*, 28(3), pp. 203–227.

Appendix

Table A1. Questionnaire.

Section	Item					
1[a]	*Demographic information*					
1a	Gender	Male	Female			
1b	Age	17–20	21–25	26 and above		
1c	Year of study					
1d	Class of studentship	Home	EU	Overseas		
1e	Programme of study					
1f	University of study					
2[a]	*Internet use and facilities*					
2a	From where do you access the Internet?	Home	Campus	Both home and campus	Internet cafe	
2b	How many hours a week do you spend on the Internet?	0–5 hrs	6–10 hrs	11–15 hrs	16 hrs and above	
2c	How many hours do you spend on WebCT/ Blackboard per week?	0–5 hrs	6–10 hrs	11–15 hrs	16 hrs and above	
2d	How long have you been using the WebCT/ Blackboard?	1–2 yrs	3–4 yrs	5 yrs and above		
		Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
2e	I am satisfied with my home Internet facilities	1	2	3	4	5
2f	I am satisfied with my university's Internet facilities	1	2	3	4	5
2g	My access to the WebCT/ Blackboard from outside the university is easy	1	2	3	4	5
2h	The WebCT/Blackboard facility is user-friendly	1	2	3	4	5

(*Continued*)

Table A1. Continued

Section	Item					
3[a]	*VLE use*					
3a	The use of WebCT/ Blackboard enhances my interaction with my instructor	1	2	3	4	5
3b	The use of WebCT/ Blackboard enhances the feedbacks I get from my instructor	1	2	3	4	5
3c	The use of WebCT/ Blackboard improves the structure of my learning	1	2	3	4	5
3d	The use of WebCT/ Blackboard is an enjoyable way of learning	1	2	3	4	5
3e	The use of the WebCT/ Blackboard is a motivating way of learning	1	2	3	4	5
3f	The use of WebCT/ Blackboard is particularly suitable to learn Accounting modules	1	2	3	4	5
4[a]	*Course content and user interface*					
4a	I encounter technological difficulties in using WebCT/Blackboard	1	2	3	4	5
4b	The structure of navigation of WebCT/Blackboard is easy to follow	1	2	3	4	5
4c	I find learning materials on WebCT/Blackboard useful	1	2	3	4	5
4d	I find WebCT/Blackboard useful for accessing my results	1	2	3	4	5
4e	I find WebCT/Blackboard's email facility useful for contacting my instructor	1	2	3	4	5
4f	I find WebCT/Blackboard's email facility useful for contacting my course mates	1	2	3	4	5
4g	I find WebCT/Blackboard's discussion board facility useful for my learning	1	2	3	4	5

(*Continued*)

Table A1. Continued

Section	Item					
4h	I find WebCT/Blackboard's blog facility useful for my learning	1	2	3	4	5
4i	I find the WebCT/ Blackboard's module evaluation facility useful as a feedback mechanism	1	2	3	4	5
4j	Overall, I am satisfied with my university's e-learning facilities	1	2	3	4	5
4k	Overall, the university's e-learning facilities have improved my academic performance	1	2	3	4	5
5[a]	*VLE and cognitive skills*					
5a	The use of WebCT/ Blackboard has enhanced my knowledge base	1	2	3	4	5
5b	The use of WebCT/ Blackboard has enhanced my comprehension ability	1	2	3	4	5
5c	The use of WebCT/ Blackboard has enhanced my problem-solving skills	1	2	3	4	5
5d	The use of WebCT/ Blackboard has enhanced my analytical skills	1	2	3	4	5
5e	The use of WebCT/ Blackboard has enhanced my ability to synthesise ideas	1	2	3	4	5
5f	The use of WebCT/ Blackboard has enhanced my ability to evaluate issues	1	2	3	4	5
6[a]	*Comparison between learning through VLE and face-to-face learning*					
6a	I prefer the VLE to face-to-face lectures	1	2	3	4	5
6b	I prefer a mix of face-to-face lecture and VLE systems	1	2	3	4	5
6c	It is easier to communicate with my instructor with the VLE system than with the face-to-face system	1	2	3	4	5
6d	It is easier to communicate with my co-students with the VLE system than with the face-to-face system	1	2	3	4	5

(*Continued*)

Table A1. Continued

Section	Item					
6e	I learn better with the VLE system than with the face-to-face system	1	2	3	4	5
6f	Learning with the VLE system takes a lesser time than learning with the face-to-face system	1	2	3	4	5
6g	I am better motivated with the VLE system than with the face-to-face learning system	1	2	3	4	5