

CORRELATIONAL STUDY ON VIRTUAL LEARNING
ENVIRONMENT AND STUDENTS' ACADEMIC
PERFORMANCE AT TABUK UNIVERSITY
SAUDI ARABIA

BY

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ABSTRACT

The aim of this study is to investigate the non-traditional student perceptions of the VLE based on the Keller's ARCS model of motivational design and how the components of this model correlate to students' academic performance. The study population consists of students from the Faculty of Arts at Tabuk University (UT) in the KSA with three specializations (Arabic, Islamic studies and languages), who study on the distance learning system and use the virtual classes. The study sample consisted of 324 non-traditional students. The quantitative approach was used in this study. The study employed stratified proportionate sampling to select the sample of 324 undergraduate students of Tabuk University. In order to collect data from this sample, the study used a questionnaire as a data collection tool consisting of 51 items. The content validity of this questionnaire was verified by twelve experts and computation of content validity ratio (CVR = 91.8%). The Principle Components Analysis (PCA) was conducted on a pilot study to reveal the basic components, as it became clear that there are 6 dimensions with 31 items (attention 4-items, relevance 8-items, confidence 4-items, satisfaction 5-items, appraisal 4-items, and academic performance 6-items), and 68.47% of variance. Cronbach's alpha used to test the reliability of the questionnaire, indicates a high level of internal consistency. In order to collect the data, the final version of the questionnaire was translated into Arabic and to ensure the translation was correct, it was presented to experts. The questionnaire was then distributed to the students using Google Form by uploading it onto UT-LMS in coordination with the university's technical support. After obtaining student responses, SPSS was used to analyse the data. In order to obtain the results of this study, the descriptive analysis and the Confirmatory Factor Analysis (CFA) were used. The results indicated that the validity of the scale and its reliability consist of six dimensions and its components can be used in future studies to measure students' academic performance in virtual learning environments. Multiple Regression Analysis (MRA) showed that there are four important predictors of students' academic performance (Satisfaction, Relevance, Confidence, and Appraisal). Of these four, satisfaction appeared to be the strongest indicator, while attention did not appear as an important indicator of students' academic performance. T-test was applied and the result showed that there was no statistically significant difference between male and female in terms of students' academic performance. In addition, one-way ANOVA analysis indicated that there were no statistically significant difference between the three groups (Islamic, Arabic and Linguistic Studies) in terms of academic performance.

خلاصة البحث

هدفت هذه الدراسة إلى استطلاع تصورات الطلاب الغير تقليديين للتصميم التحفيزي لبيئة التعلم الافتراضية (VLE) على أساس نموذج ARCS من Keller ومدى ارتباط مكونات هذا النموذج مع الأداء الأكاديمي للطلاب. حيث تكون مجتمع الدراسة من طلبة كلية التربية والآداب في جامعة تبوك بالمملكة العربية السعودية بتخصصاتها الثلاثة (اللغة العربية، والدراسات الإسلامية، واللغات) والذين يدرسون بنظام التعلم عن بُعد ويستخدمون الصفوف الافتراضية. وقد تكونت عينة الدراسة من ٣٢٤ طالباً غير تقليدي. تم استخدام المنهج الكمي في هذه الدراسة، حيث استخدمت الدراسة طريقة العينة الطبقية العشوائية المناسبة لاختيار عينة الدراسة والتي تكونت من ٣٢٤ طالبا من مجتمع الدراسة. ولأجل جمع البيانات من هذه العينة استخدمت الدراسة استبيان كأداة لجمع البيانات مكون من ٥١ بند حيث تم إثبات صدق المحتوى لهذا الاستبيان باستخدام عدد ١٢ خبير وحساب نسبة صدق المحتوى حيث كانت (CVR= 91.8%) وقد تم إجراء تحليل المكونات الرئيسية (PCA) على دراسة استطلاعية للكشف عن المكونات الأساسية حيث اتضح وجود عدد ٦ أبعاد بواقع ٣١ بند هي (الاهتمام ٤-بنود، الملائمة ٨-بنود، الثقة ٤-بنود، الرضى ٥-بنود، الأداء الأكاديمي ٦-بنود، والتقييم ٤-بنود) حيث كانت توضح هذه الأبعاد الأساسية الستة مع ٣١ بنداً حوالي ٦٨,٤٧٪ من التباين. وقد كان مقياس الثبات لهذه الدراسة حسب مقياس ألفا كرونباخ لهذا المقياس هو $\alpha = 0.946$ ، مما يشير إلى مستوى عالٍ من الاتساق الداخلي للمقاييس مع هذه العينة المحددة. ولجمع البيانات فقد تم ترجمة النسخة النهائية من الاستبيان باللغة العربية والتأكد من صحة الترجمة من خلال عرضها على مختصين، وبعد ذلك تم توزيعها على الطلاب باستخدام (Google Form) ورفعها على رابط إلكتروني وربطها بنظام التعلم الإلكتروني لجامعة تبوك بالتنسيق مع قسم التقنية بالجامعة. وبعد الحصول على استجابات الطلاب ولأجل تحليل هذه البيانات تم وضعها باستخدام برنامج SPSS. وللحصول على نتائج هذه الدراسة فقد تم استخدام التحليل الوصفي والتحليل العاملي التوكيدي (CFA) وأشارت نتائجه إلى تأكيد صحة المقياس وموثوقيته حيث يتكون من ستة أبعاد مع عناصرها يمكن استخدامها في الدراسات المستقبلية لقياس الأداء الأكاديمي للطلاب في بيئات التعلم الافتراضية. وتحليل الانحدار المتعدد (MRA) حيث أظهرت نتائجه المطبقة على البيانات أن أربعة تنبؤات مهمة لأداء الطلاب الأكاديمي (الرضا والأهمية والثقة والتقييم). من بين هؤلاء الأربعة، بدا أن الرضا هو أقوى مؤشر، في حين أن الاهتمام لم يظهر كمؤشر هام لأداء الطلاب الأكاديمي. وقد طبق اختبار (t-test) وأظهرت نتائجه عدم وجود فروق ذات دلالة إحصائية بين الذكور والإناث من حيث الأداء الأكاديمي للطلاب وفقاً لما أبلغ عنه الطلاب. علاوة على ذلك، أشار تحليل ANOVA في اتجاه واحد إلى عدم وجود فروق ذات دلالة إحصائية بين المجموعات الثلاث (الدراسات الإسلامية واللغة العربية واللغوية) من حيث الأداء الأكاديمي.

APPROVAL PAGE

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DECLARATION

I hereby declare that this dissertation is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

This chapter discusses the characteristics of non-traditional students and their interests in continuing education at Tabuk University in Saudi Arabia via e-learning and the university's virtual learning environment (VLE) system. In recent years, e-learning and VLE have become almost synonymous with ICT-integrated pedagogy in higher education. Almost every tertiary learning institution in the world today provides multiple e-learning and VLE solutions to support alternative ways of teaching and learning. For non-traditional students, these network technologies have a great influence on their learning engagement, academic performance and motivation to use VLE and remain in the e-learning programmes. In this chapter, motivating students via the design of VLEs will be discussed along with how this motivational design influences students' academic performance. Also, the Saudi learners in higher education are in need of more motivational strategies to sustain their learning in a virtual learning environment (Xanthidis, Wali & Nikolaidis, 2013). These issues have been the concerns of University of Tabuk in Saudi Arabia. Apart from these two central issues, the theoretical and conceptual frameworks for the study, research objectives and research questions will be also presented in this chapter.

1.2 E-LEARNING AND NON-TRADITIONAL STUDENTS IN HIGHER EDUCATION

E-learning is a ubiquitous phenomenon in today's higher education. The growing numbers of traditional and non-traditional learners over the years show an increasing interest in e-learning in higher learning institutions across the world (El-Seoud, Taj-Eddin, Seddiek, El-Khouly & Nosseir, 2014). The term "traditional students" refers to teenagers and youth aged between 18 and 24 who have just graduated from high schools. Normally, they are young and single individuals, and do not have regular jobs that can hinder them from attending college classes (Rash, Skinner, Kline & Blanch, 2008). Non-traditional students, on the other hand, are typically working adults who have not been able to complete their undergraduate education and are now returning to the classrooms. Brookfield (2010) defined this group of students as those who decided to return to college to complete an education which they previously were not able to complete. Usually, this category of adult learners would "desire flexibility in scheduling, geographic location and access to resources" (Bichsel, 2013, p. 2).

Ross-Gordon (2011) delineated five characteristics that are peculiar to non-traditional students: (1) their entry into college is delayed by at least one year after completing high school; (2) they work full time and study part-time; (3) they are financially independent; (4) some may even be single parents with several dependents; and (5) they may not have high school diplomas. As non-traditional students' enrolments are increasing, academic programmes in universities must now consider the needs of this group of students who wish to go back to college to receive a degree or enhance their education. Being older and more mature than traditional students, they have different motivating factors for success and different academic goals and pursuits. At the same time, they are also facing learning barriers that are different from

those faced by traditional students. Their learning barriers may include having families or spouses, full-time jobs, or one family member needing special care as well as the responsibility of paying a loan (Adams & Corbett, 2010).

Most non-traditional students with full-time jobs may face time constraints to study in higher education institutions as compared to traditional students. In Saudi Arabia, for instance, married female students may need to spend a longer time to acquire a degree as they have limited time to study. Similarly, for those who are working in big cities or far from the cities, they may find it harder to find a suitable time and place to study and complete their assignments on time amid their busy schedules. Lower socioeconomic status may be another challenge as non-traditional students may have to work in order to pay for their continuing education. In this regard, universities should make e-learning effective and appealing for non-traditional students in order to help them to achieve their academic goals.

E-learning has been defined in several different ways. Clark and Mayer (2011) defined it as a means of instruction delivered on digital devices such as computers, tablets, or mobiles in order to support learning and help individuals achieve their educational goals. According to Rosenberg (2001), e-learning is the use of Internet technologies to deliver a broad array of solutions that enhance students' knowledge and performances. Other authors have described e-learning as a teaching and learning process supported by information and communication technology (ICT) without requiring lecturers and learners to be in the same physical location (Cartas, 2012; Bashshar, 2017). Drawing on the definitions given by multiple authors, e-learning may thus be synthesized for this study as the use of ICT, the Internet, computer networks and digital devices to design, deliver and facilitate learning contents and

instructions to enhance the knowledge and academic performances of non-traditional students.

For the purpose of advancing teaching and learning experiences, e-learning embraces a wide range of educational technologies such as physical hardware, software, electronic media and educational theories. Among the newest trends in e-learning that provide a wide range of knowledge and materials to students are Learning Management Systems (LMSs) and Virtual Learning Environments (VLEs) (Hettiarachchi & Wickramasinghe, 2016). In particular, VLEs can facilitate teaching and learning processes as well as provide materials for learners anytime, anywhere. They pave the way for more learning flexibility and autonomy in higher education. The use of these virtual learning platforms makes e-learning more flexible and sustainable. In addition, it accelerates a shift in higher education towards supporting continued professional development and lifelong learning (Basak, Wotto & Belanger, 2016). Thus, effective and motivational e-learning is a critical success factor in the continuing education of non-traditional students.

Allan, O'Driscoll, Simpson and Shawe (2013) observed that universities often fail to consider non-traditional students' learning needs meaningfully in developing their e-learning strategies, particularly in the design of VLEs. For instance, as succinctly explained by Rash *et al.* (2008), a key characteristic of non-traditional students is that they have multiple roles to play in their daily lives. Most of them occupy full-time jobs and attend school as part-timers. Some others may even have families and children. These multiple roles often present challenges to non-traditional students to remain motivated in their academic pursuits and to perform well academically. With their diverse responsibilities, non-traditional students need to balance their limited time for work, family and study properly. Poor time management

is often an issue that affects non-traditional students' academic performance in an e-learning programme. Moreover, performing poorly may result in decreased motivation, and gradually in their dropping out of the e-learning programme. Thus, universities must carefully consider the needs of non-traditional students when designing a VLE for their continuing education programmes.

1.3 THE IMPORTANCE OF VIRTUAL LEARNING ENVIRONMENTS

Virtual learning environments (VLE) evolved many decades ago with the rise of e-learning. By definition, VLE refers to designed information spaces that give priority to content structure, design and management (Dillenbourg, 2000) in order to be an effective learning platform. VLE does not refer to just any educational website nor is it restricted to network systems that include 3D or virtual reality technology. Dillenbourg, Schneider and Synteta (2002) outlined several important characteristics that distinguish a VLE from the normal educational website. In addition to being considered well-structured, well-designed information spaces, VLEs have an interface that allows users to see the ensemble of learning objects or materials made available by the lecturer. Students can add, share, download or even edit these learning objects. Ideally, a VLE is a social space where learners converge to communicate and interact with peers and lecturers directly online.

A well-designed VLE also integrates heterogeneous technologies such as video streaming and social media including blogs, wikis and social networks. All of these technologies have the capacity to allow learners to engage and collaborate with each other (Friedman & Friedman, 2013; Bashshar, 2017). In addition, the social interaction in VLEs includes synchronous (e.g. chat, MUDs and MOOs) and asynchronous (e.g. electronic mail and forums) communication, one-to-one versus

one-to-many or many-to-many, text-based versus audio, and video-based communication. The social interaction also includes indirect communication such as sharing objects or materials. In other words, VLEs allow learners to interact with peers, contents and lecturers as well as with the system itself.

Regardless of the physical location, VLEs should be designed to be a collaborative learning environment (Dillenbourg, 2000). The University of Tabuk in Saudi Arabia, for example, uses an open-source web conferencing system like *BigBlueBotton* web. In this kind of environment, the e-learning instructors can share their desktops, and draw and drop on canvas to present the materials to students. In the meantime, students can also ask questions or share ideas synchronously through the chat communication room that is available on the right side of the desktop. In this kind of cooperative learning that occurs online, students are more likely to achieve effective academic and social learning outcomes (Killen, 1998; Veloo, Ali & Chairany, 2016). In short, a VLE represents a collaborative learning environment where students can exchange and generate ideas, learn from one another, and help one another using multiple functions of available instructional technologies. Hence, the design of a VLE should be dynamic and interactive, not just static web pages with a number of HTML links.

Similarly, VLE is also referred to as a Web-based learning platform designed to facilitate teaching and learning through the use of digital tools (Wilson & Lanerolle, 2016; Parrish, 2016; Tunku Ahmad & Doheny, 2014) and interactive activities. The course instructors normally build multiple interactive activities using forums, discussion boards, surveys, lessons, virtual classrooms, wikis, quizzes, chat rooms, blogs, and video/audio conferences. For example, they can use course blogger to announce the topics of students' discussions in the next lecture, create course

forums to start discussion sessions, or divide students into small virtual discussion groups. These interactive activities give students good opportunities to share ideas and knowledge as well as interact with their lecturers and material itself. Thus, the robust features of VLEs allow the course instructors or facilitators to share educational materials with their students in many different forms either synchronously or asynchronously (BBC, 2017; Barker & Gossman, 2013).

As previously discussed, VLE allows non-traditional students to learn, communicate and collaborate with each other in an online learning community without needing to attend physical classrooms (Dillenbourg, 2000). Online learners must feel that they are part of a learning community. The feeling is important as it prevents social isolation from affecting and demotivating them. Feeling that they are part of a community with the same shared goal helps to sustain students' interest and motivation in the online programme, without which they may decide to discontinue and withdraw from the programme. In terms of academic benefits, theoretically driven and well-designed VLEs are instrumental in improving learners' knowledge, skills, and performance (Hampel, 2014). In other words, VLEs play an important role in the continuing education of non-traditional learners to ensure that they remain motivated and are able to perform well academically.

In summary, the use of VLEs practically supports new ways of teaching and learning. The technology enables students to get an education via alternative means, using a dynamic combination of visual, oral or auditory resources. As an example, language teachers at a university may use different tools in a VLE to help their undergraduates to study grammar. Vidal (2016) illustrated the use of two digital tools in teaching Spanish language in different activities. In this situation, Twine (an open-source tool for telling interactive, nonlinear stories) was first used to create a story-

game in which students needed to reflect on the differences between two tenses: the simple past and the past continuous. It followed by using educational *videos* as a digital tool to show different uses of the indicative and subjunctive modes in the contexts and then shared the grammar use on the discussion board. Both of these ways enhanced students' experiences by facilitating the understanding of the grammar while developing their strategies for self-directed learning.

Based on the preceding explanation, the adoption of VLEs in higher education is crucial to the academic pursuits of students, especially those who are not able to attend traditional courses and lectures because they work full time and/or have other commitments during the day. As an option, they may enrol in Internet-enabled distance education programmes and derive maximum benefits from the online education offered by universities.

1.4 MOTIVATION AND ACADEMIC PERFORMANCE IN LEARNING VIA VLES

In the absence of face-to-face classes, students' interaction with a virtual learning environment (VLE), its materials and learning activities is of paramount importance. The most important purpose of using a VLE for non-traditional students is to facilitate their learning process, motivate them to stay engaged in the course, and improve their academic performance. Thus, in an e-learning distance education programme, full utilization of the VLE will enhance students' skills, knowledge, experience and achievements.

Students' academic performance is a multidimensional concept. Its indicators include successful completion of courses, good grades, learning achievements, knowledge improvement, and skills development. Recent research shows that VLEs

have a positive effect on improving students' knowledge, skills and interest in the subject matter (Agrawal *et al.*, 2016; Kamalludeen, Hassan & Nasaruddin, 2016). Almost similarly, Alves, Miranda and Morais (2017) found that there is a positive relationship between students' use of VLEs (that is, the amount of time they spent on it) and their academic performance. In addition, Chowdhry, Sieler and Alwis (2014) discovered an association between the final marks obtained by students and the way the modules were structured around the VLE. This suggests that how a VLE is designed to promote learning plays an important role in influencing students' academic performance.

Effective VLE design influences students' motivation, which in turn affects their academic performance in a VLE-dependent distance education programme. Motivation can be understood as the impetus that gets students interested in participating in a learning task (Mart, 2011). In order to engage students, the learning environment and activities must be stimulating. Moreover, students have different learning styles and preferences. Hence, developing appropriate motivational strategies and instructional design to help improve and maintain their motivation is also important (Mart, 2011). For that reason, VLEs for non-traditional adult students should take into consideration the suitable motivational strategies. The literature on motivational theories presents many strategies that can help to develop and design motivational strategies to enhance students' learning and performance. More precisely, motivational designs should be applied into physical and virtual learning environments, curricula, materials, and activities (Keller, 2010). In brief, instructional and motivational designs are key components that have a major impact on students' motivation in any learning environment (Hartnett *et al.*, 2011; Keller, 2010).

The relationship between the use of a VLE and students' academic performance and motivation is that a well-designed VLE improves and increases both students' motivation and academic performance (Abdul Majid & Hasim, 2019). So, it is important to build motivation into a VLE design to boost the academic performance of non-traditional students. In the context of this study, *motivational design* refers to the process of arranging resources, procedures and learning activities to keep students engaged and interested in the education programme. Keller (2010) proposed four design components that can achieve this aim, namely attention (A), relevance (R), confidence (C) and satisfaction (S), hence ARCS. Attention focuses on creating and sustaining students' curiosity and interest; relevance aims at enhancing students' values of the learning activities by making the teaching materials and teaching activities relevant to their needs, interests and motives; confidence helps students develop a positive expectation for successful achievement of learning outcomes; while satisfaction provides extrinsic and intrinsic reinforcement for the effort students put in (Suo & Hou, 2017). Further explanations of these four factors will be given in Chapter Two of this thesis.

Out of numerous instructional design models, Malik (2014) believed that Keller's ARCS is one of the effective models to overcome the challenges in designing meaningful VLE activities. ARCS plays an important role in terms of increasing students' motivation in a distance learning environment. Malik (2014) argued that the use of the ARCS design features should motivate students to complete online courses, help learning institutions increase the graduate rates of students taking online courses, and solve low motivational problems of distance learners. For these reasons, Keller's ARCS motivational model was used as the framework for this study.

1.5 VLE ADOPTION AT THE UNIVERSITY OF TABUK

VLE adoption in Saudi Arabia started with the establishment of the Arab Open University (AOU) in 2003 as a virtual higher education institution. As a branch of UK Open University, it functions as a traditional distance education institution using different technological devices such as TV, radio, recorded lectures, and the like. Now, the university is using technology to provide affordable online lessons for students. In Saudi today, most higher education institutions offer online courses in the medical, economic and other fields, which aim primarily at facilitating the learning process.

Saudi Arabia's Vision 2030 is the kingdom's vision for the future that is targeted at developing the digital infrastructure in order to make the country an internationally competitive ICT hub. On the one hand, many universities in Saudi tend to enhance their e-learning programs and units. Unsurprisingly, these faculties employ Learning Management Systems (LMS) and virtual classrooms that can be efficiently used to improve students' capability level, productivity and performance. Moreover, more digital libraries and centers are founded in the kingdom to reinforce the importance of using technology in education. In reality, the rapid expansion of e-learning centers in the Kingdom has become increasingly noticeable. Two recent examples are the e-learning centers at Effat University in Jeddah and the Prince Mohammed bin Fahd University in Dammam (Weber & Hamlaoui, 2018; Aljaber, 2018).

Despite this development, many obstacles are facing Saudi's e-learning progress (Al-Jarf, 2005). As pointed out by recent research, many Saudi students at King Saud University (KSU) in Riyadh and Umm AL-Qura University (UQU) are reportedly unfamiliar with e-learning strategies, claiming that they are unable to