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Acceptance of the students of the faculty of veterinary medicine, south valley university to the technology of e-tests platforms: a case of google form quiz

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Abstract

Application of technology became a part of histology teaching and examination. For years, the 1ST year students used to do a traditional examination (Pen-paper tests) in the Histology subject twice a year (January and May). Google form quiz as a method of electronic test was introduced to the 1st year students at the Faculty of Veterinary Medicine, South Valley University for the first time in May 2019. The level of students' acceptance of the new approach was evaluated using s questionnaire based on technology acceptance model. Analysis of the students' responses revealed a high acceptance rate to E-test cloud platform. Factors affecting the student acceptance rate were Perceived Ease of Use, Perceived Usefulness, Behavioural Intension and Actual Use. It is recommended to apply the Google form quiz as an official and accepted E-test platform at the South Valley university. Furthermore, the faculty members and students should be trained to use this new approach in the examination.

Keywords

Acceptance of technology - e-tests platforms - google form

Introduction

The continuous development of E-learning technology in terms of design and development has created an urgent need to develop strategies and plans for development and evaluation, to keep up with the variables and use them in the best possible way. One of the most important developments in the field of information and communication technology (ICT) is to employ these techniques in the education process at universities. Using the ICT in education starts from the processes of design, identification of electronic learning sources and its management and use. In this type of testing, the faculty member uses an electronic assessment program to assess students at the end of an educational situation. That turns evaluation methods from the traditional method of paper and pen-based tests to E-tests s (E-tests) with no need of faculty member manual evaluation as usual. These methods can be used to diagnose and analyse students' performance as a result of gaining knowledge, skills or emotions achieved after a period of learning in different educational situations. The achievement of E-tests complies with the rules, standards and protocols for the use of networks. The use of E-tests helps the faculty member to design questions in accordance with international standards that applies to students in different educational situations where E-tests are characterized by many advantages (Alyahya & Almutairi, 2019), including:

1) Interactivity: It is the experiences of the learners with the environment of E-tests through their responses such as pressing a key on the keyboard or writing text, or specify a certain place, …etc.

(2) Multimedia use: Where it is possible to include the functions of rating a lot of information that can be displayed using multimedia elements integrating the written text, audio and fixed animated images.

(3) Immediate grading of the test: That saves the time and effort, and the possibility of preparing several copies of the same test.

(4) Keeping records of student responses: That makes it is possible to print out hard copies of the tests when needed.

(5) Producing a Question Bank: It allows data use and analysis and make storing a set of questions on storage media (Question Bank) is possible.

(6) Increasing the degree of some aspects of the test sincerity and consistency.

(7) Strict evaluation and grade monitoring.

(8) Its application does not require the determination of a specific place or time for its completion and extradition.

(9) The comprehensiveness in covering most of the provided vocabulary in addition to their use in measuring levels and diverse abilities of students.

Although, the many advantages could gain when using E-tests, it has many problems which could be summarized according to (Karami, Heussen, Schmitz-Rode, & Baumann, 2009) as follows:

(1) Maintenance of the security of the questions and students' answers and their results. These securities could be broken when the network is exposed to hackers. However, this problem can be reduced by security measures and firewalls on the server used for the E-tests.

(2) Students need two skills and a prior experience in ICT. This problem has been solved in the Egyptian universities through training programmes for students on ICT and rehabilitation to get international computer driving license (ICDL), which has become a requirement for the graduation in accordance with the decision of the Supreme Council of Egyptian universities.

(3) The problem of fraud of others. It is possible to limit this problem by electronic surveillance cameras and submitting test questions for students in accordance with the order is random. It is possible to shuffle the display order of the questions between the students and modify the order of answer options for each question of the same test.

(4) The fraud of educational resources available on the internet. This problem can be solved by preventing the student from using these sources, so that if they try to use it his test will be closed immediately.

(5) Another person, not the student, may try to do the test. So, it is important to check the identity of the students through some methods such as electronic signatures or electronic fingerprints.

(6) Hardware and software malfunctions during testing. In order to reduce this problem, periodic maintenance and examination of hardware and software are required before running the E-tests.

(7) Training the faculty members on E-learning technologies. The current study was developed as a solution to this problem with the suggestion of more training programs according to training needs and rehabilitation of faculty members to deal with technological innovations used in the field of education and examination.

To predict the use of individuals to technology, many models have been suggested. These models attempt to explain the dynamic acceptance of the technology by offering special perception and predictions through quantitative studies built on student responses. The Technology Acceptance Model (TAM) is the most important model explaining the factors affecting acceptance and the use of technology. The TAM has been developed by Davis (Revythi & Tselios, 2019; Tsai, 2015), who assumed that the technology acceptance of individuals depends on perceived ease of use and perceived usefulness. These two factors are influenced by a range of external variables. The TAM interpretants the acceptance of the use of information technology through four successive phases:

1. User's training affects his perceptions about the use of the system.

2. User's perceptions affect their attitude to the system.

3. User's attitudes affect intentions to use the system.

4. User's intentions determine the level of use.

The TAM is a user-friendly model and flexible to suit academic educational institutions, and fully describes the dimensions of technological acceptance. The final and modified version of the TAM (Venkatesh & Davis, 2000) consists of the following factors:

I. Behavioural Variables

. These variables include:

1- Perceived Ease of Use (PEOU): It refers to the degree to which an individual believes the use of technology is easy and does not require any effort or suffering.

2- Perceived Usefulness (PU). It is the degree to which an individual believes that the use of technology can enhance and improve his or her work performance.

3- Behavioural Intention (BI): It is the planned behaviour of the individual and it is expected through the PEOU and PU.

4- The Actual Use (AU). It refers to the individual's actual practice of technology and is predicted through the BI.

II- External Variables: Such as demographic variables. These influence the PEOU and PU.

Between the advantages and the problems, the students have different views on the adoption of E-tests. Based on the theory of technological innovations and what was previously reported (Wilson, Sherry, Dobrovolny, Batty, & Ryder, 2002), factors that contribute to the student's rejection of E-tests can be summarized as follow:

(1) Rejection through an ignorance: Which results from the lack of student's knowledge of using the E-testing technology and their fear of the complexities of its use.

(2) Rejection through default: Which is due to the lack of faculty member's knowledge and skills of preparing and designing E-tests.

(3) Rejection by maintaining the statuesque: Many faculty members and students reject the E-tests to maintain stable system of traditional tests, they used to use for long time.

(4) Rejection through social mores: The idea of the E-tests is not accepted by a society, and the faculty member as a part of this society will not prefer or even resist the E-tests idea.

(5) Rejection through interpersonal relationships: That is due to the complete objectivity of the E-tests, then there is no room for complacency or preference to someone on another.

(6) Rejection through erroneous. The faculty member refuses E-tests for reasons that don't exist.

(7) Rejection through fulfilment: It appears when faculty member confirms their preference for traditional methods.

(8) Rejection through experience: that is due to unsuccessful previous trial of E-tests either by the faculty member or the students.

According to (Anzai, 2013), The requirements necessary for the student's acceptance of E-tests are:

(1) The characteristics of E-tests in terms of usefulness, complexity, compatibility, observability and experimentation.

(2) The decision of accepting E-tests as being optional, collective or imposed by a higher authority.

(3) The awareness of the idea of E-tests. That includes identification the characteristics and potential benefits, motivations, goals, aspirations that could be achieved, problems could be solved, its limits and constraints, and procedures for its recruitment and implementation.

(4) The proper planning to apply E-tests. Planning for E-test acceptance should be accurate and comprehensive, for all the factors affecting the acceptance in any of the levels.

(5) The availability of appropriate environment for adoption and employment of E-tests. This environment includes the system configuration of the existing educational structure.

(6) Providing the physical and non-physical requirements. This is to give more attention to the equipment necessary for the implementation of E-tests efficiently and effectively, and to create the infrastructure.

Moving to technology-based learning and testing is used widely in histology courses. Many schools and laboratories moved the from traditional slide and microscope to digitalized-based platforms (Heidger et al., 2002; Scoville and Buskirk, 2007; Murphy, 2018)). Google form is one of these electronic platforms that widely is used in education used in education (Muhammad Iqbal et al., 2018). The current study aimed evaluate the acceptance of the 1st year veterinary students at South Valley University in Egypt toward the use of E-test cloud platform in practical histology examination.

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Methodology

Participants

The 1st year students of the Faculty of Veterinary Medicine, South Valley University enrolled in the Histology subjects in 2018-2019 (n=144).

Traditional practical Histology exam

Over years, the 1st year students of the Faculty of Veterinary Medicine, South Valley University must examine twice in the subjects of practical Veterinary Histology. One exam covers Cytology and general Histology and the second covers organ and system Histology. They do the first exam in January and the second one in May.

In January 2019, the students do the traditional examination as usual. The traditional test consists of 10 glass slides and each slide is connected to a microscope. Each student is offered one minute to look under the microscope and write down the name of the cell, tissue or organ on his answer sheet. The student is not allowed to come back to the microscope after he moved to the next one. After 10 minutes, the answer sheets are collected from the student and hand graded by the staff members of the Histology department. Due to the lack of microscopes, only 10 students used to do the test every time. Thus, after each group, we must replace the slides and run many examination groups.

Google Quiz-based practical Histology exam

In May 2019, the same students were introduced to a Google Quiz-based practical histology exam (E-test cloud platform). To prepare the Google-based practical histology exams, images were captured from glass slides using a light microscope connected to a camera. Ten images were uploaded to the Google form and MCQ-based exam (Fig. 1) were prepared as described ("Google learning centre", 2019). The students do the online exam in the Faculty's computer examination room on 15 may at 9 a.m. with monitoring of the Histology department staff. The students were asked to choose the best correct answer for each question and click the submission button after 10 minutes. Unlike the traditional method, the students could move between the slides before submission during the exam time. The exam was electronically graded, and the grades were collected in an Excel sheet. To decrease anxiety associated with E-test cloud platform, the students were exposed to three computerized tests in April using Google form quiz. The students could do practices using their smartphones or computes in their home or in the Faculty's computer examination room.

Figure 1: An example of questions in Google quiz-based exam

Identify the histological structure *

○ Zona pellucida

○ Theca lutin cell

○ Granulosa lutin cell

○ Cell nest

Technology of E-test platform acceptance questionnaire

To measure the acceptance level of the students for the new exam methodology, the authors developed a technology of E-tests platforms acceptance questionnaire based on other studies. The questionnaire divided into four sections to measure Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Behavioural Intention (BI) and Actual Use (AU). The level of satisfaction was measured on the Likert scales (Very satisfied, satisfied, moderately satisfied, unsatisfied and very unsatisfied). The questionnaire was administrated to the 1st year students (n=144) registered in the Histology course in the Faculty of Veterinary Medicine, South Valley University, Egypt through google online form in the period from the 17th to 25th of May. Sixty-six students (about 46%) participated in the questionnaire. The respondent answers were analysed using EXCEL 2016 and the mean ± Standard error (SE) was calculated for each question. The responses were scored based on the Likert scale quintet degree in Table 1.

Table (1) Likert scale quintet degree.

weighted mean	Level
from 4.25 to 5.00	Strongly agree
from 3.40 to 4.19	Agree
from 2.60 to 3.39	Neutral
from 1.80 to 2.59	Disagree
from 1.00 to 1.79	Strongly disagree

RESULTS AND DISCUSSION

Application of the technology became a part of Histology practical education and examination (Heidger et al., 2002; Scoville and Buskirk, 2007)). The students at the Department of Veterinary Histology of the SVU, Egypt were offered examination in May 2019 using E-test platform; Google form quiz. Using this tool has many advantages such as quick and immediate evaluation, lack of student's cross talk and communications during the test, prevention of question leaking outside the examination room (Cernochová, Pospísilová, Lichnovská, Erdösová, & Krajci, 2012). After examination, the students were invited to respond to a questionnaire prepared by the authors and based on the TAM. The aim of the questionnaire was to evaluate their acceptance of using E-test cloud platform in practical histology test. The factors of TAM were analyzed through the application of the questionnaire and the mean ±SE of the respondent' answers were classified as follows:

Factor one: Perceived Ease of Use (PEOU)

Table (2) Impact of PEOU on student' acceptance of E-test cloud platform

Item		Mean	SE	Result
Perceived Ease of Use	I can solve problems when dealing with E-test platforms	3.98	0.11	Agree
	I am afraid of compatibility problems of E-test applications with different operating systems	3.23	0.13	Nearly agree
	It is easy to control E-test platform tools	4.61	0.10	Strongly agree
	I make many mistakes when using E-test platforms	2.30	0.12	Disagree
	I am afraid of power outages during the test	3.50	0.14	Agree
	I prefer E-test on traditional Test	4.53	0.11	Strongly agree
	E-test do not consider technical differences between users	2.85	0.15	Nearly agree
	Easy to run E-test platforms	4.55	0.09	Strongly agree
	It takes a long time to learn how to perform the exam using E-test platforms	2.12	0.13	Disagree

	I often need help during the performance of E-tests	2.38	0.13	Disagree
	In general, I find it easy to use E-test platforms	4.67	0.08	Strongly agree
Total		3.52	0.3	Agree

The Table (2) showed that the PEOU influenced the student acceptance of the E-test cloud platform. The mean of the whole factor was 3.52±0.3. The paragraph "In general, I find it easy to use E-test platforms" ranked first with an average 4.67±0.8. This refers to a high student's acceptance rate to use the E-test cloud platform. This is likely due to the assimilation of knowledge and skills possessed by students through their training on this type of technology before applying the final E-test which allow them to use the E-test with easiness. While the paragraph "It takes a long time to learn how to perform the exam using the E-test platforms" ranked last with an average of 2.12±0.13. This corresponds to the estimation of students of non-approval on the need of the students for a long time to learn the E-test platform due to the nature of the platform 'Google form quiz', which is characterized by its ease of interface to use and supports Arabic writing and works on Personal computers, tablets and smartphones with different operating systems. This result agrees with other studies (Sha, 2010; Sadik, 2017)).

Factor two: Perceived Usefulness (PU)

Table (3) Impact of PU on student' acceptance of E-test cloud platform

	Item	Mean	SE	Result
Perceived Usefulness	I'm afraid of failing to accomplish some tasks in E-tests	2.53	0.13	Disagree
	E-test's negatives are more than their advantages	1.67	0.11	Strongly disagree
	E-test platforms help me to immediately boost test results	3.79	0.13	Agree
	I feel uncomfortable when using E-test platforms	1.88	0.12	Disagree
	It is Hard to cheat on E-test platforms	3.56	0.16	Agree
	E-test platforms improve my educational performance because they are support digital media	3.62	0.14	Agree
	I can control time better in the E-test than traditional test	3.76	0.17	Agree
	In general, E-test improves my performance on the exam	3.82	0.15	Agree
Total		3.08	0.3	Agree

The Table (3) showed that the PU had an impact on the student acceptance of E-test cloud platform. The paragraph: 'In general, E-test improve my performance on the exam' was on the top with an average of 3.82±0.3, which corresponds to 'agree'. This is result reflects the positive feeling of the students about the importance of the E-test cloud platform which they think that will improve their performance in their exams. In the E-test, the students could scroll their answers up and down through questions and review their answers before submission, which was not the case in the traditional-pen and paper test. However, the paragraph 'E-test's negatives are more than their advantages' ranked the last with an average of 1.67±0.11, which means strongly disagree. That may be due to the many advantages of the 'Google form quiz' reported in other studies (Hallur, 2016; Sivakumar, 2019).

Factor Three: Behavioral Intension (BI)

Table (4) Impact of BI on student' acceptance of E-test cloud platform

	Item	Mean	SE	Result
Behavioural Intension	I need more training to use E-test platforms	2.65	0.14	Nearly agree
	I intend to use applications of E-test platforms in the future	3.94	0.12	Agree
	I feel comfortable when using E-test platforms	3.91	0.14	Agree
	E-test platforms met all my expectations	3.50	0.13	Agree
Total		3.5	0.3	agree

The Table (4) showed that the BI had an impact (3.5±0.3) on the student acceptance of E-test cloud platform. This may reflect that the BI is related to the ease or difficulty expected to behavioral performance through direct or indirect effects of PEUO and PU on student' acceptance, where both two factors showed impacts on the student's acceptance of E-tests. The paragraph 'I intend to use applications of E-test platforms in the future' came on the

top with an average of 3.94±0.12, which correspond to 'agree'. That refers to the student are likely enjoying dealing with E-test cloud platform. While, the paragraph' E-test platforms met all my expectations' ranked last (3.5±0.13), and that is due to the gap between what is expected and what is perceived by students from these applications.

Factor four: Actual use (AU)
Table (4) Impact of (AU on student' acceptance of E-test cloud platform

	Item	Mean	SE	Result
Actual Use	I Know enough to use E-test platforms	3.55	0.13	Agree
	I have the skills to deal with the applications of E- tests	3.67	0.12	Agree
	I got benefited from dealing with E-test platforms in saving time and effort	4.12	0.13	Agree
	E-test platform increase self-confidence	3.70	0.14	Agree
	I can use the E-test platform by myself	3.82	0.13	Agree
	My colleagues are recommended using E-test platform applications	4.00	0.13	Agree
Total		3.81	0.08	Agree

The Table (4) showed that the actual use E-test cloud platform has an impact on student acceptance of E-test cloud platform with an average of 3.81±0.08 and this is likely due to the BI factor. It was reported that according to the theory of Reasoned Action, the BI is the main determinant of behavioral adoption. The TAM for predicting the actual use of a new technology depends on two factors; the PEOU and PU. These two factors are influenced by a set of external variables and thus affect the user's BI to actually use the technology (Harryanto, Muchran, & Ahmar, 2018). Paragraph 'I Know enough to use E-test platforms' ranked first with an average of 4.12±0.13 and thus is likely due to the Ease of access and support offered by these E-test cloud platforms. Paragraph 'I Know enough to use E-test platforms' with an average of 3.55±50.13. This is due to the non-use of E-test cloud platform in teaching and this was referred to by some students in interviews conducted during the application of the research tool.

The current study showed that the 1st year student at the SVU accept and preferred the new approach of E-test cloud platform in the practical histology examination. All factors of TAM affect the students' acceptance of E-test cloud platform. The results revealed that there was a PEOU by the students shared this research, which resulted in a PU. The PEOU and PU factors affected the BI of student use to a great extent and the need for student's training to discover the possibilities of these applications that enable them to learn. Students are using E-test cloud platform when they believe that these applications will enable them to perform learning tasks better and easier.

It would be better if the teaching methodology in the practical histology could be modified to use digital histology image banks during the course. Training secession of E-test cloud platforms for the students should be run during the course to prepared them for the final examination. It is recommended to apply the Google form quiz as an official E-test platform at the SVU with further evaluation of this platform by students from other departments and faculties.

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