International Journal of Linguistics, Literature and Translation (IJLLT)
ISSN: 2617-0299 (Online); ISSN: 2708-0099 (Print)
DOI: 10.32996/ijllt
www.ijllt.org

Original Research Article

The Usability Outlook of Computer-Based Exams as A means of Assessment and Examination: A case study of Palestine Technical University

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ARTICLE INFO

Received: March 01, 2019
Accepted: March 25, 2020
Published: March 31, 2020
Volume: 3
Issue: 3
DOI: 10.32996/ijllt.2020.3.3.16

KEYWORDS

Computer-based Exam, Paper-based Exam, PTUK, Remedial English, LMS-Moodle, Multiple-choice Questions, Reliability, Validity, Security , Assessment, Examination

ABSTRACT

Recently, computer-based exams, in replacement for the traditional paper-based exams, have become a booming trend that is endorsed by many educational institutions and universities all over the world; this endorsement has been a direct outcome of the advancement in computer technology and the rapid spread of the internet. Accordingly, the aim of this study was to investigate the usability outlook of computer –based exams as a means of assessment and examination , and to identify some of the reflections on the experiment of Palestine Technical University- Kadoorie (PTUK)\ Tulkarm Campus in implementing such an assessment on one of the English language introductory courses , namely, Remedial English course (no.15200099). To achieve the purpose of this study, and to answer its questions, the researcher scrutinized, in a survey-like and a descriptive methodology, throughout the findings and conclusions of the available related literature in order to draw a line of understanding in regard to the main aim of this study and its questions. The findings of this study revealed that using computer-based exams in replacement for the traditional paper-based exams represents a domain of an ongoing debate between adherents and opponents who anchor their points of view to various sets of reasons and rationales. The findings also pointed out some problems and setbacks in regard to the experiment of (PTUK) in implementing computer-based exams, as means of assessment and examination , on one of the English language introductory courses, namely, Remedial English course (no.15200099); some of these problems and setbacks are mainly connected with the (LMS-Moodle), which is used as a medium of carrying out and disclosing the Remedial English Exam, and, in addition, the complete dependence on multiple-choice questions, which are the only type used by (LMS-Moodle). The study concluded with some recommendation for future research.

Introduction and Background

Computer-based examinations, as manifested by the available previous literature, are defined and named differently. For example, Ayo et al., 2007, p. 126 , cited in Shraim, K. (2019: 185), stated that "Online examinations, commonly known as electronic examinations (e-exams) and previously as computer-based assessment, can be defined as a system that involves the conduct of examinations through the web or the intranet" Cantillon, P., Irish, B., & Sales, D. (2004: 606), stated that " Computer based testing (also called computer based assessment or computer assisted assessment) is not just an alternative method for delivering examinations, it represents an important qualitative shift away from traditional methods such as paper based tests." Cantillon, Irish and Sales (2004: 606), also added that " computer-based testing is where computers provide an assessment interface for students: they input their answers and receive feedback via a computer." Consequently, and

regardless the fact that the above-mentioned definitions and terms are seemingly various, they share a unified consideration in relation to computer-based exams, that is, viewing computers to be the core component of the whole assessment process. Moreover, it should be added that computer-based exams are by-products of the unprecedented spread of computers, the development and advancement in computer technology, the proliferation of the internet, and the availability of digital methodology. This, yet, has motivated many academic institutions and universities to embrace computer-based exams, as a means of assessment and examination, in replacement for the traditional paper-based exams. Another motivation for such an embracement, the researcher believes, is the professedly benefits of using computers and the internet as means of learning different topics and subjects , especially, English language in what is called , as a result, e-learning ; this was confirmed by previous literature. For example, Alsulami (2016: 1), stated that " computer software, social networking websites, online videos, audio tools (i.e., YouTube, Skype, MP3 players), and smart phone and tablet apps have a positive impact on learning English as a foreign language. "; Alsulami (2016: 2), also added that "Today's technology provides students with numerous options for learning the English language that can be convenient and fit the learning requirements of the student. " Nomass (2013), cited in Alsulami (2016: 12), concluded that " With the increase in smartphone and tablet apps, learners can use these tools to exercise their handwriting and to gain more confidence in reading and writing through the use of touchscreen programs." But the supposedly success in learning English using the media of computers and internet, the researcher believes, may not correlate with using these as media of assessment and examination ; this, the researcher believes, has also resulted in a mix between two different methodologies , that is , e-learning and e-assessment and examination . However , the changeover itself , from the traditional paper-based exams to computer-based exams as a means of assessment and examination, has yielded some kind of a widening gap and triggered an ongoing debate between those adherents of traditional paper-based exams and those supporters of computer-based exams in a way that both parties have tried to support their points of view by presenting two antithetical rationales ; some of the previous related literature asserted this notion. For example, Öz (2014: 46), stated that "Over the past two decades, web-based assessment has remained a significant subject of such research areas. Some practitioners continue to express their concerns regarding the drawbacks of using this form of assessment." In spite of this ongoing debate , Palestine Technical University- Kadoorie (PTUK)\ Tulkarm Campus, together with some other Palestinian Universities, has adopted computer-based examinations in replacement for the traditional paper-based examinations to assess and measure students' achievement in a variety of subjects and courses , including English language courses, for both the formative and the summative assessment ; this was confirmed by Shraim, K. (2019: 188), who indicated that " A significant number of HEIs in Palestine have recently implemented online exams. Among these, PTUK has begun using e-exams for foundation courses on which a large number of students are registered, including Arabic Language, English Language, Computer Skills, Communication Skills, Islamic Studies and Palestinian Studies. Two mandatory online exams, the mid-term and summative final examinations, are taken during each semester, replacing paper-based assessment practices. The purpose of these exams is to evaluate students' achievement and to provide automatic grading."

As far as English Language Courses are concerned , Palestine Technical University- Kadoorie (PTUK)\ Tulkarm Campus, where the researcher has been a lecturer of varieties of general and introductory English Language courses since 2004 , has implemented computer- based exams (also known as computerized exams and e-exams), in replacement for the traditional paper- based exams, on one of the English introductory courses , namely, Remedial English (no.15200099). This course is basically directed to those undergraduate students of (PTUK) who couldn't achieve a passing mark (50% out of 100%) in the placement test which is mandatory for all students who are admitted to (PTUK). This computer- based exam, of the Remedial English Couse (no. 15200099), includes two exam sessions - Midterm and Final- which are held in a computer-based format via the PTUK (LMS-Moodle) in an only multiple-choice matrix. In this regard, the researcher believes, in accordance with the previous literature, and depending on the researchers' personal experience, that using (LMS)-Moodle) with an only multiple-choice matrix to measure students' achievement in English language courses may not be a dependable

methodology because the (LMS)-Moodle) is a problem in itself and can have an impact on the reliability , validity, and the security of the exam ; this same reasoning was reflected by Hillier (2014, 85), who stated that "The majority of academics who assign these computerized quizzes in their course utilize an institutional LMS that was not designed for the task of exams." Fluck, Pullen, and Harper, C. (2009 :511), also added that "LMS based online testing environments offer useful tools for conducting assessments of knowledge. Automated marking is feasible for multiple choice questions, and for short answer questions where key words are sought in the response." ; the second problem with this exam matrix, and in respect to English language examinations, is that multiple-choice questions do not correspond with measuring students' responses in open-ended questions nor can they measure all English language skills such as writing which is a central skill that students should be able to acquire and learn in order to enlarge their academic horizon and to sharpen their critical thinking skills as well; In addition , multiple-choice questions do not also correspond with measuring higher-cognitive skills ; (Byrnes & Ellis, 2006: 509), confirmed this idea by concluding that "Current computer based assessment models focus on the assessment of knowledge rather than deeper understandings, using multiple choice type questions, and blocking access to more sophisticated software tools." Bull, J., and McKenna, C. (2004), cited in Öz (2014: 47), also stated that "web-based assessment would not be able to rate testing formats that allow students to express their thoughts such as essays." The third problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that the replacement from a paper- based exam to a computer-based exams , as far as the researcher knows, was undertaken by the examinations management of (PTUK) without previously considering the attitudes and the specialized opinions of the English teachers nor the attitudes of students who represent the would-be exam takers . The importance of such kind of previous transaction was confirmed by previous related literature. For example, Alrob, Abu, Asad and Daqar (2019 : 196) pointed that " the attitudes of instructors and students, as well as the quality of the exams must be taken into consideration prior to the changeover;" Hosseini and Toroujeni (2017: 78), indicated that there is a " necessity of doing comparability studies in higher educational contexts before substituting CBT for PBT or including it in the system." Dermo, J. (2009). cited in Hillier, M. (2014, 79), concluded that there are " some criteria to be taken into consideration when making computer-based exams (e-exams) such as " 'affective factors' (how students feel about e-exams), 'teaching and learning' (how e-exams assist students with their learning), 'validity' (whether e-exams are appropriate for specific disciplines), 'reliability' (how e-exams accurately assesses student performance), 'practicality' (how e-exams are undertaken), and 'security' (security of e-exams compared to paper based exams)." Madsen (1990) and Fulcher (1999) cited in Coniam (2006: 195) also confirmed that "Although studies have shown test takers to be in favor of computer-based tests, other studies have indicated test takers to be less keen." Coniam (1999), cited in (Coniam, (2006: 195) , added that "test takers responded favorably to computer-based tests when demands placed upon them were limited: for example, simply clicking on the answer in multiple-choice tests." The fourth facet of the problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that the exam is disclosed to the exam-takers in a serial successive , and separate sessions due to the fact that the number of exam -takers of the Remedial English is usually greater than the capacity of all the available computer-labs of (PTUK) to be managed at the same time in one simultaneous session for all exam-takers ; this, as confirmed by previous related literature, may have a negative and damaging impact on the security of the exam as well as the reliability and validity. Furthermore, it should be stated that the specifications and the whole environment of the available computer- labs of (PTUK), as far as the researcher knows, were not verified as to be suitable for the processes of English Language assessment and examination.

The Significance of this Study

The significance of this study lies in the fact that it can direct the attention of educators, teachers and examinations managements , in Palestinian Universities as well as Universities elsewhere, towards the argument and the debate between those adherents and opponents of using computer-based exams, in replacement for the traditional paper-based exams, as a means of assessment in general and , likewise, as a channel of English language assessment and examination processes ; as a result, the significance of this study, justifiably , exists in

the fact that it can establish an exploitable ground of understanding that can focus the attention of educators, teachers and examinations managements , in Palestinian Universities as well as Universities elsewhere, on the strong and weak points of the debate and considerations of the adherents and opponents of using computer-based exams in replacement for the traditional paper-based exam leading to improving both modes of exams. Another facet of the significance of this study is that it can orient the attention of educators, teachers and examinations managements , in (PTUK) as well as other Palestinian Universities towards what can work with English language assessment and examination methodology by shedding additional light on the peculiarity of English language in this regard , and in comparison with other topics and subjects. As far as the researcher knows, and in accordance with the available literature in the field, it can be stated that there are very few studies on the topic in a Palestinian setting, except for , of course, the study of Shraim (2019) and Alrob, Abu, Asad and Daqar (2019) ; both studies, yet, dealt with computer-based exams in replacement for paper-based exams in a general scope and with no specific connections to English language assessment and examination methodology. As a result, this study can be a formulated addition to research in the field.

Literature Review

The aim of this literature review is to present the considerations, rationale, and reasons of both adherents and opponents of using computer-based exams in replacement for the traditional paper-based exams as a means of assessment and examinations. Correspondingly, this literature review will be divided into two main sections: the first section presents those studies that are related to the considerations and reasons of those adherents of using computer-based exams in replacement for the traditional paper-based exams as a means of assessment and examinations; the second sections, which is divided into three sub-sections, presents the considerations and reasons of those opponents of using computer-based exams in replacement for the traditional paper-based exams as a means of assessment and examinations.

Adherents of using computer-based exams as a means of assessment.

The following section of the literature review presents an overview of findings and conclusions of the available related literature that reflects the supporting points of view of those adherents of using computer-based exams as a means of assessment and as a reliable alternative to the traditional paper-based exams : Swets JD, Feurzeig (1965), cited in Cantillon, Irish, and Sales(2004: 606), stated that "Computer based tests have been used since the 1960s to test knowledge and problem solving skills." Ayo, Akinyemi, Adebiyi and Ekong (2007: 132), argued that "E-examination has the advantage of being easy to administer, ability to offer applicants instant results, easy verification, devoid of paper work and longtime involved in marking examination scripts which in most cases are prone to errors and misplacement of some scripts due to the large volume of scripts that has to be marked and accessed." Bull and McKenna (2004, p.3), cited in Öz (2014: 46), indicated that "Over the past two decades developments in computer speed and accuracy have accelerated the use of computer technology in many areas of education. Educational institutions have increasingly come to rely on online systems of instruction and assessment." (Sadiq & Onianwa, 2011), cited in Abubakar, A. S., & Adebayo, F. O. (2014 : 47), concluded that " It is becoming commonplace to see institutions across the educational strata adopt computer-based tests (CBT) and assessment to admit or screen students for entrance into Nigerian institutions." Mills, Potenza, Fremer, and Ward (2005: ix), stated that " CBT is now a common form of test delivery for licensure, certification, and admissions tests. Many large- scale, high-stakes testing programs have introduced CBT either as an option or as the sole means of test delivery." Bridgeman, 2009; Clariana & Wallace, 2002). Cited in Blazer, C. (2010: 1), stated that "Computer- based testing is already used successfully for military training exams, job application exams in the private sector, state drivers' license exams, entrance exams into postsecondary educational institutions, and certification exams by professional groups ." Hardcastle, J., Herrmann-Abell, C. F., & DeBoer, G. E. (2017:1), stated that "With the increased availably of computers, many assessments are being administered as computer-based tests (CBT). CBT provides several advantages over paper-and-pencil tests (PPT) including ease and flexibility of administering and grading tests, as well as allowing for the development of novel technology-based testing environments." Mills, Potenza, Fremer, and Ward. (2005: x) concluded that " CBT also allows for substantial

reductions in the time between test administration and score reporting, a significant benefit in the eyes of many." Mills, Potenza, Fremer, and Ward (2005: x), also added that " test sponsors are free to offer their tests more frequently, a convenience that many examinees find appealing. " Shraim, K. (2019: 185), concluded that " online exams were perceived to have significant benefits over traditional, paper-based examinations, including reliability of grading and efficiency in terms of time, effort and money spent on the exam process." Bull, J., & McKenna, C. (2004, p.3), cited in Öz, H. (2014: 46), stated that "educators emphasize the need for aiding administrative efficiency, increasing the frequency of assessment, extending the range of assessment methods 'through computer-aided instruction' and increasing objectivity and consistency among many pedagogical issues."Jamil, M., Tariq, R. H., & Shami, P. A. (2012), cited in Sindre, G., & Vegendla, A. (2015: 11), "concluded that attitude among their informants was quite positive towards computer-based examinations, though in some cases, teachers preferred paper as well." Öz, H. (2014: 50), demonstrated that "the pre-service English teachers have generally positive computer attitude and positive perception towards ease of use of web-based testing for their Approaches and Methods course." Hosseini, M., & Toroujeni, S. M. H. (2017: 78), found that " participants mostly showed high preference for computerized test and liked CBT more than PBT but due to some justifications and habit of taking tests traditionally, they performed better on PBT." Hosseini, M., Abidin, M. J. Z., & Baghdarnia, M. (2014: 659), found that "computer familiarity and attitude towards computer had no significant influence on the students' performance in computerized test. Additionally, participants showed more preference on test features presented on the computer test."Akdemir, O., & Oguz, A. (2008), found that there was no " significant difference between the students' scores, which showed that web-based testing is a convincing alternative to paper-based tests." Blazer, C. (2010: 13), found that "there is very little difference in test scores when multiple- choice tests are administered on computers versus with paper-and-pencil." Sindre, G., & Vegendla, A. (2015: 4). For e-exams, distribution of questions and collection of answers can be fully automated. Clarifications to questions could be done online, which not only makes this task easier for the teachers, but also improves fairness as all candidates of an exam could get the same information at the same time. Sindre, G., & Vegendla, A. (2015: 4), concluded that "Randomizing the order of questions makes such cheating much harder for multiple choice and short answer questions, since it increases the cheaters' communication burden when question information must also be included. Such randomization is easy for e-exams, while much harder for paper exams due to more cumbersome printing and copying of question sets."

To sum up, the abovementioned literature presented the reasons, the rationale , and the supporting justifications that supports the stand of the adherents of using computer-based exam in replacement for the traditional paper-based exams : On the one hand, based on the abovementioned review of the available related literature , computer-based exams have become so common due to the fact that the world, nowadays, is witnessing unprecedented progress in computer software, hardware , speed, accuracy, simplicity, and easiness in executing various types of corresponding tasks; on the other hand, as far as examinations are concerned , adherents of using computer-based exams propose that such a methodology can lead to building exams that are easily administered and frequently carried out as computer-based exams can save time, effort, and money that are normally consumed using heavy load of paper in paper-based exams ; in addition, based on the points of view of those adherents of using computer-based exams, the format of the computer-based exams allows the distribution and randomization of questions which , in turn, can result in error-free questions and easiness in collecting responses as well as fairness , objectivity, and reliability in marking and grading. Generally, some studies within the above presented review disclosed positive attitudes of both teachers and exam takers in regard to computer-based exams on the ground that computer-based exams can narrow the chances for cheating to occur.

Opponents of using computer-based exams as a means of assessment.

This section of the available related literature represents a contradictory consideration of the previously presented section of the literature review as it establishes an account of the rationale and reasons of those opponents who believe that computer-based exams may not be a reliable means of assessment and examination due to the fact that computer-based exams carry various problems and numerous setbacks within . The following

review of the available related literature categorizes those problems and setbacks into three main domains: The first domain presents the problems and setbacks that are related to computer technicalities; the second domain presents the problems and setbacks that are related to test-takers; while the third domain presents the problems and setbacks that are related to the exam format.

Problems and setbacks related to computer technicalities

Ainley & Searle, 2007, p.7 , cited in Fluck, A., Pullen, D., and Harper, C. (2009: 509) stated that "Without a suitable, computer based way of conducting examinations (as an example of rigorous or standardized assessment), curriculum transformation may be unlikely to occur because assessment is a major determinant in teaching." Blazer, C. (2010: 1), stated that "the mode in which students take a test may have an impact on their performance when demographic characteristics, computer skills, computer type, test characteristics, item type, and content area tested are considered. In particular, some studies suggest that students with more computer skills receive higher scores on computer-based tests." Kyllonen (2009) Cited in Blazer, C. (2010: 3) stated that "Computers add an extra layer of complication, require extra reviews, advanced set-ups, and tryouts." Akdemir and Oğuz (2008), cited in Öz (2014: 47), concluded that "the limitations of computer testing hardware and software may pose problems with computer-based assessment. "Mills, Potenza, Fremer, and Ward (2005: 13) concluded that "standard procedures for disclosure of paper-and-pencil tests seem poorly suited for computerized tests." Dawson (2016), cited in Sindre, G., & Vegendla, A. (2015 :3), "classified some tactics that can be used by some of the students who sitting for e-exam". Sindre and Vegendla (2015 :3) state that the following threats can easily be envisioned related to the PC:

- Electronic communication between candidates, or with assisting outsiders.
- Copy-paste plagiarism of allowed or non-allowed sources.
- Peeking at neighbor answers might be easier due to the upright angle of screens.
- The PC can contain materials or tools not allowed for the exam.
- Bigger amounts of information can be crammed into smaller objects (e.g., memory sticks rather than paper), yielding more effective cheating by object passing, either directly between candidates in the exam room, or by using the restroom as a mailbox."

Dawson (2016) and Dawson (2016). cited in Sindre and Vegendla, (2015 :3), also proposed that " e- exams may have several serious cheating threats that paper exams do not have." Meurant, R. C. (2009:4), concluded that " it is difficult to prevent students then improperly accessing online resources when taking online quizzes, placement test and exams, where they may have been instructed not to do so." Meurant, R. C. (2009:4), also added that "it is very difficult to ensure students do not cheat." Öz, H. (2014: 45), indicated that " Factors such as frequency of internet usage and level of computer literacy were also found to have significant impact on the students' attitudes towards web-based assessment."Öz, H. (2014: 56), also concluded that " The results also revealed that there was a negative association between computer literacy and anxiety, which suggests that more proficient internet users are less anxious about using web-based assessments than those who are not so familiar with the internet." Akdemir and Oğuz (2008), cited in Öz, H. (2014: 47), concluded that " computer experience and competency could affect the scores and confidence in undergoing computer-based testing." (Csapó et al., 2010; Education Commission of the States, 2010; Thompson & Weiss, 2009; Gamire & Pearson, 2006; Paek, 2005; Poggio et al., 2005). Cited in Blazer, C. (2010: 3), stated that "students with more computer skills perform at higher levels on computer-based tests than students with lower levels of computer skills." Mangen, A., Walgermo, B. R., & Brønnick, K. (2013) cited in Solak, E. (2014: 204), concluded that "the participants' academic achievement was higher in paper-based reading than screen-based reading."

Solak, E. (2014: 203), proposed that "paper-based tasks were superior to computer- based tasks in terms of speed, accuracy and comprehension." Blazer, C. (2010: 5), concluded that "students do not obtain the same results when they take an identical test on both computer and on paper." Blazer, C. (2010: 1), explained that "students'

performance may decline when they are required to scroll through information on the computer screen in order to respond to questions. "

To sum up, the abovementioned literature proposes that the computer-based exam takers' experience in using computers, the extent of their familiarity with computers, their frequency of using the internet and software, and their endeavor scrolling through screens of computers may affect their performance and jeopardizes the security of the exam , which, as a result, means that the fairness, validity, security, and reliability of the computer-based exam are all at risk of being not achieved. The findings of the abovementioned literature also stated that computers may facilitate computer-based exam takers' tactics in cheating and plagiarism in the sense that exam-takers can access internet information that are related to the exam. In addition, the abovementioned literature stated that computers in computer-based exams add extra burdens and limitations in that they need appropriate software , continuous set-ups, and frequent updating.

Problems and setbacks related to exam- takers

Coniam (2006: 195).). pointed out that "computer-based tests need to be considered from various perspectives. While computer-based testing makes life easier for administrators, the same cannot necessarily be said for test takers. Hochlehnert A, BrassK, Moeltner A, Juenger J (2011), cited in Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015: 3) , found that "only37% of students voluntarily chose to take a high-stakes exam via the computer, and that test-taking strategies were a reason why students opted for the paper-based exam." Bayazit and Asker (2012), cited in Alrob, M., Abu, M. A., Asad, N. A., & Daqar, M. A. (2019 : 197), stated that "According to students, computer-based exams needed more time than paper exams, as noise and screen-time harm adversely impacted understanding." Shraim, K. (2019: 185), "participants identified many challenges facing the successful implementation of online exams regarding security, validity and fairness issues." Hillier, M. (2014, cited in Sindre, G., & Vegendla, A. (2015: 11), found that " students on average thought that e-exams would be less secure than paper exams, but the difference was not massive." Coniam (1999) cited in Coniam, D. (2006: 195).), stated that "Where demands were greater, however, such as having to type in missing words and phrases, and subsequently calling up that input to amend it, test takers reacted much less favorably to the test, with a marked preference for a paper-based version of the test." , (Education Commission of the States, 2010; Buško, 2009; Lee, 2009; Martin, 2009; Wang & Shin, 2009; Florida Department of Education, 2006; Higgins et al., 2005; Paek, 2005), Cited in Blazer, C. (2010: 2). Concluded that " students prefer computer-based assessments over paper-and- pencil tests. However, it should be noted that correlations between enjoyment of computer-based tests and achievement have been found to be weak. In other words, students' preference for taking tests on computers doesn't necessarily translate into higher test scores." Solak, E. (2014: 202), concluded that "prospective English teachers preferred paper-based reading to computer version and their performance was higher in paper-based reading than computer." Clariana, R., & Wallace, P. (2002). cited in Sindre, G., & Vegendla, A. (2015: 11), found that "higher attaining students benefit more from computer-based assessments compared to paper-based ones. " Al. Amri (2009), cited in Hosseini, M., & Toroujeni, S. M. H. (2017: 80), concluded that " the comparison between test scores of CBT and PBT among undergraduate students in Saudi Arabia showed no significant difference between mean scores but slightly better performance on PBT." Blazer, C. (2010: 13), indicated that "Some studies suggest that computer characteristics (such as screen size and monitor resolution) may affect students' performance on computer-based tests." Blazer, C. (2010: 13), also added that "scrolling in particular may lead to declines in performance when students are required to scroll through information on the computer screen in order to respond to items." Solak, E. (2014: 208) , pointed out that " participants expressed that they could not use reading strategies effectively and could not concentrate on the screen." Dillon (1994) cited in Solak, E. (2014: 203) , concluded that "reading was nearly 20 to 30% slower with regard to performance from a computer screen than a paper." Yen & Wang (2002) cited in Solak, E. (2014: 203), concluded that "most people did not deal with e-based reading well. The main obstacles were the lower level of man- machine interactions and self-control during e-reading process." DeStefano, D., & LeFevre, J. A. (2007). cited in Solak, E. (2014: 208), found that "readers with low working memory and low prior knowledge were usually disadvantaged in hypertext." Kim,

H., & Kim, J. O. A. N. (2013). cited in Solak, E. (2014: 204), concluded that “teenagers scored significantly higher on the paper reading comprehension tests than on the electronic ones. Furthermore, it was reported that it took longer time to read passages and answer questions on the screen." Blazer, C. (2010: 13), found that “boys tend to outperform girls on computer-based tests, while girls tend to outperform boys on paper-and-pencil tests."

To sum up, the abovementioned literature presented an account of the problems and setbacks of using computer-based exams as a means of assessment and examination**;** these conservative opinions are related to the exam- takers themselves and their perspectives as well : Firstly, according to exam-takers' points of view, computer-based exams require more time to read passages and comprehension questions on screens than that on paper-based exam; second, the abovementioned literature revealed , in accordance with the points of view of the exam- takers , that not all tasks are suitable for computer-based exams, and that the proposed easiness in executing the exam may be for the administration of the exam rather than for exam-takers; third, the abovementioned literature confirms that exam- takers , normally, react in a less favorable way when the demands of the computer-based exam are higher; fourth, the abovementioned literature proposed that learning from the computer-based exam is minimum in level due to the fact that exam –takers may not be allowed to check their responses and then learn from their mistakes in the exam; fifth, the abovementioned literature concluded that better scores can be achieved with computer-based exams format , but better performance can be correlated with paper-based exams format, and that exam-takers' preferences of computer-based exams may not translate into higher scores; sixth, the abovementioned literature revealed that the performance of the computer-based exam-takers may be affected by the demographic characteristics of the exam-takers, the computer characteristics such as screen size, and monitor resolution, and the low working memory and low prior knowledge of the computer-based exam-takers ; seventh, the abovementioned literature concluded that boys , generally, exhibit better performance than girls on computer-based exams.

Problems and setbacks related to exam format

Solak, E. (2014: 203), indicated that “Recent literature especially after 2000s comparing computer and paper-based reading has supported the findings of early studies and favored paper-based reading.” Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015: 2), concluded that “In order to ensure a smooth transition to computer-based examining in higher education ,it is important that students perform equally well on computer-based and paper-based administered exams. If, for example, computer-based administration would result inconsistently lower scores than paper-based administration, due to unfamiliarity with the test mode or due to technical problems this would result in biased measurement.” Khoshsima, H., Hosseini, M., & Toroujeni, S. M. H. (2017: 24), argued that "Several studies have been recently conducted to show that in order to replace computer-based test with its conventional paper-and-pencil counterpart, we need to prove that these two versions of test are comparable, in other words the validity and reliability of the computerized counterpart are not violated. In fact, the most critical problem that arises from converting PPT into CBT is validity. However, enough convincing evidence is not available to indicate that the CBT counterpart of a test may produce less valid results." Bull and McKenna, (2004), cited in Öz, H. (2014: 47). Concluded that "It is not enough to simply change the test -administration mode; the administrators need to adapt the tests to suit computer testing hardware and software capabilities." Carlson, 1994). Cited in Coniam, D. (2006: 194), stated that “ An adaptive computer-based test does not involve simply translating a p a p e r-based test to a computer-based medium; rather it is a subtype of computer- b a s e d testing, whereby test takers are offered items which are pitched as far as possible at the test takers’ ability level.” The Florida Department of Education (2006) , Cited in Blazer, C. (2010: 5), proposed that “Choosing between computer-administered and paper-administered tests would be easier if there were clear, incontrovertible evidence that for all students there is no difference in results whether a test is taken on computer or by printed test materials.” Shraim, K. (2019: 185), concluded that “The findings also indicate that e-exams are particularly suitable for formative assessment, for measuring learning rather than the summative assessment of learning. The successful implementation of online exams depends on designing them to be valid, reliable, secure and flexible.” Laborda, J. G., Royo, T. M., Lazaro, N. R., & Marugan, L. F. (2015: 1303), indicated

that "Technology has been conveniently utilized in informal assessment but summative high-stakes language testing has not used them similarly."Flowers et al. (2011), cited in Khoshsima, H., Hosseini, M., & Toroujeni, S. M. H. (2017: 24), concluded that " there was a high preference for CBT, and test takers' preference had negative correlation with their performance on CBT." Al-Amri (2009), cited in Khoshsima, H., Hosseini, M., & Toroujeni, S. M. H. (2017: 24), found that "although test takers preferred to take CBT, their test performance was better on PPT." Öz, H. (2014: 46), investigated the pre-service teachers' attitudes towards paper-based exams or web-based exams, and found that " four participants (8%) prefer web-based examinations only, and the remaining participants (44%) prefer paper-based examinations only." Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015: 1), found that " After taking the computer-based exam, fifty percent of the students preferred paper-and-pencil exams over computer-based exams and about a quarter preferred a computer-based exam." Sindre, G., & Vegendla, A. (2015: 1), concluded that " there has been reluctance towards introducing e-exams in many universities." Shraim (2019: 188), stated that "While most considered e-exam results more accurate, an even greater proportion (79%) of participants disagreed that online exams are fairer than paper-based ones. They believed that randomizing the questions from a question bank would mean that some students could be asked relatively easy questions and others more difficult ones." Shraim (2019: 194), also added that "The findings also indicate that fairness, validity and security aspects are the main challenges facing the successful implementation of online exams."

Khoshsima, Hosseini and Toroujeni (2017: 24) indicated that "Empirical research on cross-mode comparability should be conducted to find out whether test scores across testing modes are equivalent in order to replace PPT with CBT." Meurant, R. C. (2009:4), stated that " the types of questions that can be set in an online environment have certain constraints, and favor set answers e.g. true/false, multiple choice and matching question types, though open-ended and even essay-type questions can also be set and fairly efficiently graded." Bull McKenna (2004) cited in Öz, H. (2014: 47), argued that "the objective-type format used in web-based assessment can be "disempowering" because it makes students inactive participants of the process (p.18). Students may lose the opportunity to interpret the question or raise alternative ideas as they are usually confined to a given set of answers. Bull, J., & McKenna, C. (2004). cited in Öz (2014: 47), added that " Another disadvantage of this method is the lack of flexibility and judgment of computers especially in dealing with partially correct answers." Blazer, C. (2010: 13), concluded that "open-ended items lead to more performance differentials between computer-based and paper-and-pencil tests, compared to tests comprised of multiple-choice items." Towns MH, Robinson WR (1993) ; Kim YH, Goetz ET (1993), Cited in Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015: 3), stated that "exams with multiple-choice questions, several questions are usually presented per page, and students have the complete exam at their disposal throughout the time allotted to complete the exam. Common test-taking strategies for multiple-choice exams include making notes, marking key words in specific questions, and eliminating answer categories Boevé, A. J., Meijer, R. R., Albers, C. J., Beetsma, Y., & Bosker, R. J. (2015: 3) in computer- based multiple-choice exams however, standard software may not offer these functionalities." Wells, P. (1991), cited in Katz, L. J., & Slomka, G. T. (2000: 150), asserted that "over-reliance on multiple-choice tests in the 1980s "led teachers to emphasize tasks that would reinforce rote learning and sharpen test-taking skills and discouraged curricula that promote complex thinking and active learning." Fluck, A., Pullen, D., & Harper, C. (2009: 509) argued that "Current computer based assessment models focus on the assessment of knowledge rather than deeper understandings, using multiple choice type questions, and blocking access to more sophisticated software tools." Ayo, C. K., Akinyemi, I. O., Adebiyi, A. A., & Ekong, U. O. (2007: 126) concluded that "The set of questions often used in the e-examination system are multiple choice objective tests and quizzes that can be formally and easily evaluated online." Jones, Harland, Reid & Bartlett, 2009) cited in Köksal, D., & Ulum, Ö. G. (2018: 77), concluded that " A good assessment requires an exam paper that covers different cognitive levels to accommodate diverse capabilities of learners." Köksal, D., & Ulum, Ö. G. (2018: 86) argued that "Although a list of assessment types are available, a written exam is the most employed tool chosen by academic institutions." Omar et al., 2012), cited in Köksal, D., & Ulum, Ö. G. (2018: 86), stated that "Questions raised in exams play an important role to test the students' overall cognitive levels." Leeds, 2000; Black, Harrison, & Lee, 2003; Chin,

2004; Jones, Harland, Reid, & Bartlett, 2009 cited in Köksal, D., & Ulum, Ö. G. (2018: 86), indicated that "Efficient exam questions should cover various difficulty levels to refer to the different capabilities of learners." Tucker (2009), cited in Blazer, C. (2010: 1), proposed that "approximately half of U.S. states use computers to deliver at least a portion of their annual state assessments, but noted that "even the most technologically advanced states have done little except replace the conventional paper- based, multiple-choice, fill-in-the-bubble tests with computerized versions of the same." Blazer, C. (2010: 13), argued that "computer- based tests are measuring students' computer proficiency rather than, or in addition to, their content area skills." Alrob, M., Abu, M. A., Asad, N. A., & Daqar, M. A. (2019 : 204) concluded that " in a paper exam, an instructor can intervene to give more or less grades to specific questions based on his/her discretion; so that a student who doesn't do well in a particular question can have the opportunity to be given more grades in another question for which s/he provided an engaging answer. In a computer-based test, the instructor has no control over assigning different questions specific grades." Mills, C. N., Potenza, M. T., Fremer, J. J., & Ward, W. C. (2005: 17), concluded that "Computer administered tests are impractical for large group administrations simply because it is difficult to have large numbers of computers in one place at one time." Hillier, M. (2014, 85), concluded that "academics need to be mindful that tools that work in a formative self-evaluation context may not work in a summative context. The careful choice of technology tools, planning and management of high stakes e-assessments is just as important as it is for the operations of traditional paper-based examinations." Laborda, J. G., Royo, T. M., Lazaro, N. R., & Marugan, L. F. (2015: 1302), argued that "students have to be assessed through the same delivery models that are used in their learning mode." Hillier, M. (2014, 85), suggested that the "implementation of e-exams would need to be tailored to the nature of the assessment undertaken in various discipline areas. Further that certain discipline areas are more 'ready' than others for the introduction of e-exams." Alrob, M., Abu, M. A., Asad, N. A., & Daqar, M. A. (2019 : 196), found that "there are some courses whose output cannot be genuinely assessed, particularly university obligatory and elective courses, which are taught in a lecture mode given the large numbers of students. For these courses, AAUP has built a computer-based testing system which would expectedly deliver positive results and reduce the downsides of paper tests." Alrob, Abu, Asad, and Daqar, M. A. (2019 : 200), also added that "The use of computer-based exams in specialization courses is counterproductive. For humanities, a test needs to check the style of writing and other related technicalities."

The above mentioned literature presented an account of the problems and setbacks of using computer-based exams as a means of assessment and examination that are related to the exam format itself : first , the above mentioned literature stated that paper -based exams and written formats of exams are normally preferred by teachers and academics in a sense that computer-based exams may measure computer proficiency rather than subject proficiency, and that computer-based exams are not suitable, as a means of assessment and evaluation, for all subjects or courses neither are they appropriate for large groups of exam-takers; second, the above mentioned literature concluded that computer-based exams are more suitable for formative assessment rather than summative assessment; third, the above mentioned literature found that questions of multiple-choice format are considered to be a critical limitation because they normally measure knowledge and not higher cognitive levels or deeper thinking skills , as well as , they encourage rote learning rather than creative or critical reasoning; fourth, the above mentioned literature concluded that security of the computer-based exam may not be guaranteed especially when the computer-based exams are administered in a consecutive serial sessions and for large numbers of exam-takers; fifth, the above mentioned literature concluded that exam-takers' preferences for computer-based exams may negatively correlates with their performances and scores; sixth, the abovementioned literature concluded that computer-based exams are not as fair as they are proposed to be due to the fact that randomization of the questions of the computer-based exam may lead to a situation in which some examinees get easy questions while others get more difficult ones which , as a result, jeopardizes the validity , reliability, and security of the whole exam.

Discussion

This study was basically oriented towards answering the following questions: 1. What is the usability outlook of computer-based exams as a means of assessment in replacement for the traditional paper-based exams? In regard to the first question, and in reference to the available literature, findings of this study indicate that using computer-based exams in replacement for the traditional paper-based exams is an area of an ongoing debate between supporters and opponents: Objectivity, fairness, error-free marking and grading, easiness in collecting responses, reliability in marking and grading, as well as narrowing the chances for cheating are all the rationale and the encouraging reasons that motivate supporters of using computer-based exams to endorse a positive and an adoptive standpoint in regard to using computer-based exams as a reliable means of assessment in comparison with paper-based exams.

In addition, and in reference to the previous related literature, those supporters believe that the whole process of computer-based exams can save precious time, effort, and money as they are easily administered due to the speed, accuracy, simplicity of computers. Opponents of using computer-based exams as a reliable means of assessment , on the other hand, do have an antithetical standpoint for various reasons and rationales : First, they believe that computer-based exams may not be as reliable, valid, secure , and fair as they are proposed to be due to the fact that exam-takers' experience in using computers , their familiarity with computers, and their frequency of using the internet may have an a negative impact on their performance which , in turn , means that the fairness, validity, security , and reliability of the exam are all at risk of being not achieved; furthermore, those opponents of using computer-based exams approvingly state that computer-based exams are not objective and fair, as they are supposed to be , due to the fact that some test-takers may get easy questions while others get more difficult ones because of the randomization process, and that computer-based exams may measure the exam-takers' computer proficiency rather than their subject proficiency**;** second, opponents of using computer-based exams confirmed that scrolling through screens of computers does have a negative impact on test-takers' performance and it may also facilitate exam–takers' tactics in cheating and plagiarism in the sense that exam-takers can sneak at the nearby screens of other test-takers , in addition to the fact that they can access internet information that are related to the exam ; third, opponents of using computer-based exams confirmed that security of the exam is very difficult to be guaranteed, especially when the computer-based exams are administered in a consecutive serial sessions rather than one simultaneous session for all test-takers at a time; fourth , opponents of using computer-based exams indicated that the proposed easiness in executing the exam may be attributed to the administration of the exam rather than to the exam-takers , especially when there are large numbers of exam-takers ; fifth **,** in reference to the opponents of using computer-based exams, learning from computer-based exams is minimum due to the fact that exam –takers may not be allowed to check their responses and learn from their mistakes in the exam; sixth , opponents of using computer-based exams confirmed that computer-based exams are not suitable for all subjects or courses nor are they appropriate for large groups of test-takers **,** and that computer-based exams are more suitable for formative assessment rather than summative assessment; seventh , opponents of using computer-based exams proposed that questions of the multiple-choice format are considered to be a limitation in themselves as they encourage rote learning rather than creative and critical reasoning , and that they only measure skills within the knowledge domain, but not deeper- cognitive skills or domains. In regard to the second question of this study: What reflections are there about the experiment of Palestine Technical University- Kadoorie (PTUK)\ Tulkarm Campus in implementing computer-based exams as a means of assessment on one of the English language introductory courses, namely, Remedial English course (no.15200099)? Palestine Technical University- Kadoorie (PTUK)\ Tulkarm Campus, together with some other Palestinian Universities, has adopted computer-based examinations in replacement to the traditional paper-based examinations to assess and measure students' achievement in Remedial English Course (no.15200099). This computer- based exam , or as it is also known in (PTUK) as (Computerized Exam), include some setbacks and limitations : For example , the first problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that it is carried out and disclosed to the exam-takers via PTUK

(LMS- Moodle) which, as proved by previous literature , was not designed mainly for such kind of assessment or examination nor was it suitable for summative assessment in both the educational and technical senses ; the second problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that it is built using an only multiple-choice matrix which , as concluded by previous literature , does not correlate with measuring deeper thinking skills nor they can measure English Language writing skills, comprehension open-ended questions , and questions of rewriting sentences into a different pattern or structure ; the third problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that it is normally carried out and disclosed to exam-takers in a serial successive and separate sessions due to the fact that the number of test-takers of the Remedial English is greater than the capacity of all the available computer-labs of (PTUK) as to be managed at one time in one simultaneous session; this, as confirmed by previous related literature, may have a damaging impact on the reliability , the validity , and the security of such an exam ; the fourth problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that the changeover from a paper- based exam to a computer-based exams, as far as the researcher knows, was undertaken by the examinations management of (PTUK) without previously considering the attitudes and the specialized opinions of the English teachers nor the attitudes of students who represent the would-be exam takers ; the fifth problem with the computer-based exam of the Remedial English course (no.15200099) in PTUK is that the examinations management (PTUK) , as far as the researcher can understand , deals with computer-based exams as if they were suitable, as means of assessment and examination, for all subjects and courses , including, English courses ; this generalization may not be accurate nor valid as what works with one course may not work with another course.

Findings and Conclusions

This study was oriented towards investigating about the usability outlook of computer –based exams as a means of assessment , and to identify some of the reflections on the experiment of Palestine Technical University-Kadoorie (PTUK)\ Tulkarm Campus in implementing such an assessment on one of the English language introductory courses , namely, Remedial English course (no.15200099). Accordingly, the findings of this study, in accordance with the findings of the previous related literature, reveal that there is an ongoing debate between adherents and opponents of using computer-based exams in replacement for the traditional paper-based exams as a means of assessment and examination . Moreover, in accordance with the previous related literature, findings of this study indicate that boys, generally, exhibit better performance than girls on computer-based exams and that computer-based exam takers' performances correlates negatively with their preferences because performance, as indicated by previous literature, is normally better on paper-based exams. In addition, findings of this study, in accordance with the findings of previous related literature, indicate that better scores are connected with computer-based exams, but better performance is connected with paper-based exams. Findings of this study, in accordance with the findings of previous related literature, also reveal that exam-takers' preferences of computer-based exams do not normally translate into higher scores because of two reasons: First , exam-takers need more time to read passages and comprehension questions on screens than paper-based exams; second , exam-takers with low working memory and low prior knowledge exhibit lower performance and lower scores . This study, in accordance with the findings of previous related literature, concludes that computers add extra burdens and limitations to the assessment procedure in that they need appropriate software, continuous set-ups, and frequent updating. This study also concludes, in parallel with the findings of previous related literature, that there are some problems and setbacks which are related to the implementation of a computer-based exam in replacement for the traditional paper-based exam on Remedial English Course (no.15200099) in (PTUK); these problems and setbacks are serious because they may have a negative impact on the validity, reliability, and security of the exam. As a result, this study concludes, in parallel with the findings of previous related literature, that the usability horizon of the computer-based exam may not be as wide and promising as it is proposed to be. In accordance with the conclusions of the available previous literature, this study also concludes that (LMS-

Moodle) can generally be an effective means of learning English language, but its suitability as a means of summative assessment needs more investigation and research.

Recommendations

Based on the findings and conclusions of this study, the researcher recommends carrying out detailed studies on the common grounds and unifying rationales between the adherents and the opponents of using computer-based exams so as to gain more understanding and then achieve the sought development. The researcher also recommends carrying out further studies on the suitability of the (LMS-Moodle) as a means of English -language summative assessment rather than as a means of English -language learning aid. In addition, as far as English language skills are concerned, the researcher recommends carrying out more studies on the appropriate mode of assessment and examination which positively correlates with better performance and better scores. Finally, the researcher recommends that the examinations management in (PTUK) re-evaluate the whole experiment of implementing a computer-based exam , in replacement for paper-based exam, on one of the English language introductory courses , namely, Remedial English course (no.15200099) by investigating, in a correlative methodology with scores and performance , about the test-takers' attitudes towards the computer-based exam of the Remedial English Course (no. 15200099) ; in addition, the examinations management in (PTUK) should consider the attitudes and points of view of the English teachers in regard to the replacement of the traditional paper-based exams for computer-based exams hunting for more improvement and development.

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