PERCEIVED EFFICACY OF E-PROCTORING SOFTWARE FOR EMERGENCY REMOTE ONLINE BASED ASSESSMENT: PERCEPTIONS OF PROCTORED EXAMINATIONS

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Abstract

The switch from traditional teaching methods to emergency remote online learning as a result of the outbreak of COVID-19 necessitated a change in approaches to measurement and evaluation in our educational system. A lot of methods were adopted yet the need for credible, properly monitored, valid and reliable assessment continues to be an issue of debate. E-proctoring as a popular strategy for monitoring and administering online-based examinations has witnessed tremendous success over the years yet ethical issues and many more are yet to be extensively examined. While a teacher may embrace the use of this software for monitoring examination, the perception of preservice teachers has not been explored adequately, much more the opinions of the instructors and preservice teachers on the level of efficacy with regards to the use of e-proctoring strategy for monitoring online-based examinations in a hybrid/emergency remote online educational model has not been investigated. It is in this light that this study intends to examine the perceptions of instructors and preservice teachers on the use of e-proctoring devices during online-based assessments, two research questions were investigated through a quantitative research design. A structured questionnaire was used to elicit information from 40 participants comprising of 36 students and 4 teachers on their perceptions of the effectiveness and efficacy of the e-proctored software while administering and monitoring examinations. Findings from the study will be beneficial in drawing valid conclusions on the use of e-proctored devices in monitoring emergency remote online-based assessment. The conclusions will prepare school administrators and equip them with the possible approaches to adopt in ensuring that a credible valid and reliable evaluation process is conducted during the post-COVID 19 semesters.

Introduction

Online learning is an integral part of contemporary education globally, a study which was carried out by ambient insight research does suggest that more than 1.2 million learners carried out learning through an online learning platform, yet a recent study confirms that more than 80% of learners have been engaged in online learning (Kesharvas & Hulus, 2019). The switch to emergency remote online learning as a result of the COVID-19 pandemic outbreak suggests a redesign and implementation of most instruction delivery to an online format and recently to a hybrid. While instruction delivery continues in a hybrid format, and the world looks forward to a second wave of the pandemic/ possible lockdown (which is already on-going in some parts of the world), there is a need for educational researchers to reconsider key aspects and areas of educational instructional delivery, one of such areas includes; curriculum design, educational evaluation, and assessment. Particularly, in the area of educational evaluation and assessment, there is a recent call for rethinking and redesigning the way we administer examinations to ensure that the mode of administering assessments are credible, produces positive learning outcomes, promotes positive academic integrity, transparency, malpractice, and anxiety-free (Hopfenbeck, 2020; Wald & Harland, 2020; Isinkaye, Soyemi, & Arowosegbe, 2020; Mathwasa & Sibanda, 2020; Ossai, Ethe, & Edougha, 2020). For decades, one of the most popular ideas in the pedagogy of education especially with regards to assessment in literature is the idea of online-based assessment (Bhagat, Wu, & Chang, 2016). There are growing appeals for a review of online assessments to ensure that educational assessments are valid, reliable, and properly monitored. Research on online assessment has a long tradition though issues of validity, reliability of test items, and the nature of examination monitoring have continued to pose a serious challenge (Bates, 2018). A recent strategy used for monitoring online examinations is through e-proctoring software (Cramp, Medlin, Lake, & Sharp, 2019; Kayser, 2016; Lilley, Meere, & Barker, 2016) which are yet to be adopted by educational institutions especially during the Covid-19 era. These approaches to online exam supervision have been influential in the field of education because of their success in ensuring that examinations are carried out in a conducive remote environment devoid of malpractices (Lilley, Meere, & Barker, 2016). This field has gradually broadened as many are focusing on the use of proctoring software for future online examinations, especially for post-COVID-19 semesters.

Recently, the development and use of e-proctor software for administering examinations are gaining momentum as a recent poll indicates that more than 50% of educational institutions use these proctoring devices in their universities (ProctorU, 2020; Grajek, 2020), yet there is a need to review the results achieved thereafter especially on areas of cheat detection, cheat misrepresentation and other ethical issues. It is well documented in

the literature that the utilization of online platforms especially e-proctored examinations enhances assessment delivery by ensuring that examinations are administered and monitored in a credible and convenient means (Butler-Henderson & Crawford, 2020; Clark, Callam, Paul, Stoltzfus, & Turner, 2020; Bates, 2018). Though the level of convenience, reliability, transparency, moral/ethical adherence, and credibility of these monitored examinations are yet to be ascertained or examined by researchers. These aforementioned are serious concerns for numerous authors who posit that while e-proctored examinations may have yielded results, issues of student dishonesty during examinations, malpractice, transparency, and software malfunctioning related issues continues to linger (Udechukwu, 2020; Lee, 2020; Coghlan, Miller, & Paterson, 2020, Binstein, 2015). These lead to myriads of problems as online-based examinations may not be seen as promoting academic integrity, or fostering credible, effective, efficient means of administering malpractice free and anxiety free examinations in a hybrid/ EROT model. Studies on proctored examinations have been too general in discussing these issues especially as e-proctored examinations may have not been utilized during hybrid/EROT model scenarios until recently. One way to solve this problem is to carry out a study that will elicit information from instructors and preservice teachers on their perceived efficacy of the use of e-proctoring software for administering and monitoring online-based examinations in a hybrid educational model. This will assist to re-evaluate the entire online examination process, eliciting information on the overall performance of the e-proctored software in administering credible malpractice free examination devoid of anxiety and stress.

Literature review

The use of technology makes learning more effective and efficient (Davis, Rand, & Seay, 2016; Karim, Kaminsky, & Behrend, 2014), especially in the array of benefits that it brings to education (Cramp, Medlin, Lake, & Sharp, 2019), this is evident in the advancement of the use of proctoring software for examination invigilation and supervisions to avoid the issue of examination malpractices and cheating (Kayser, 2016; Toquero, 2020). This is because technological advancements are essential in improving the student learning experience, enhancing the quality of instruction delivery, and ensuring positive learning outcomes as well (Adkins, 2011; Atoum, Chen, Liu, Hsu, & Liu, 2017; Ironsi, 2020a). Studies agree that the use of such devices like proctors will be beneficial to education by ensuring that credible examinations that are devoid of cheating, stress, and anxiety are conducted while using online-based instruction delivery (Atoum et al., 2017; Daffin Jr & Jones, 2018). True as it may seem that developments in the use of technology have benefited the educational sectors, there are also growing challenges in this sector especially during these unprecedented times of the Covid-19 pandemic outbreak. There is a need for

schools to re-evaluate the use of technology in administering and monitoring examinations to ensure that credible examinations are administered during these times of pandemic and emergency, as this will uphold academic integrity. While some may argue the need to keep the affective filter of the learner at the barest minimum during test situations (Ironsi, 2017), others believed that the pandemic outbreak was a time to offer student assistance, administering of examination following strict regulations may not be the best.

For example, previous research showed that universities in Spain have embarked on online examinations during this pandemic outbreak utilizing e-proctoring tools (González-González, Infante-Moro, & Infante-Moro, 2020). A series of recent studies have identified e-proctoring tool as the use of artificial intelligence integrated electronic tools for monitoring of remote online-based examinations (Sutton, 2019; Alessio, Malay, Maurer, Bailer, & Rubin, 2018; Davis, Rand, & Seay, 2016). Several studies suggest that though electronic proctoring tools have been used in previous times, most universities are resolving to the use of this tool for online examinations during this pandemic era (García-Peñalvo, Abella-García, Corell, & Grande, 2020; González-González et al., 2020). Previous studies have shown that there is a demand for the use of tools and devices which will ensure that the quality of most evaluation process in online-based assessment is improved (Woldeab, Lindsay, & Brothen, 2017; Bandyopadhyay, Barnes, & Bandyopadhyay, 2015), yet some believed that this increase in demand led to the rampant emergence of e-proctoring software (Daffin Jr & Jones, 2018; Karim et al., 2014). Prior research suggests that e-proctoring is majorly used in MOOCs whose major problems lie within conducting and monitoring credible and reliable examinations within the online space (Woldeab, Lindsay, & Brothen, 2017; Kayser, 2016; González-González et al., 2020). This has also been explored in prior studies that try to showcase the level of credibility that exist in using e-proctoring for online-based evaluation process (Lilley, Meere, & Barker, 2016; Sutton, 2019). Previous studies on the use of e-proctoring have emphasized that this tool allows for visual and auditory surveillance during examinations (Li, Chang, Yuan, & Hauptmann, 2015; Atoum et al., 2017), the majority of prior research has showcased the functionality of visual and auditory surveillance where the audio and cameras of the learner who is taking the examination are being monitored (Cramp, Medlin, Lake, & Sharp, 2019; Davis, Rand, & Seay, 2016).

Furthermore, most early studies, as well as current work, further shows that there are tools that could be integrated which allows the teacher to see the computer screen of the test taker while administering a test (Davis et al., 2016; Kayser, 2016). For instance, the following studies were conducted on the use of an e-proctoring tool for conducting an online based examination and it was uncovered that special browsers were incorporated in the e-proctoring device which assists in preventing the test takers from leaving the

examination while the examination is ongoing (Li et al., 2015; Lilley et al., 2016), yet studies on proctoring are well documented as it is also well acknowledged that the use of special browser assists in preventing test takers from accessing the web browser or search engines for searching for answers (Cramp, Medlin, Lake, & Sharp, 2019; González-González, Infante-Moro, & Infante-Moro, 2020). Several authors have recognized that most proctors ensure that additional tools are added that disables the test takers' web browser, which makes it impossible for the students to cheat during examinations (Atoum et al., 2017; Kayser, 2016). Yet some authors have also suggested that the integration of additional tools that will enhance its functionality will foresee that most universities begin to switch to the use of online-based assessment soon (Li et al., 2015; Rios & Liu, 2017). Again, a study suggests that more than 500 universities in Arizona State University and California State University make use of proctoring for their examinations (González-González, Infante-Moro, & Infante-Moro, 2020).

Practically, e-proctors have contributed a lot to monitoring online-based examinations though many may argue that the use of e-proctoring has not completely erased the issue of cheating or malpractice in online examination (Udechukwu, 2020). This has been discussed by a great number of authors in literature as they emphasized that a lot of deception and dishonesty are seen in online-based examinations that are proctored (Hylton, Levy, & Dringus, 2016; David et al., 2016). For example, research has provided evidence for deceptions in the online-based examination as a result of the unmonitored nature of these examinations where test-takers involve in malpractices during such examinations (David et al., 2016), these questions the integrity, credibility, validity, and reliability of such examinations as well as academic integrity. As has been previously reported in the literature, there is usually misconduct in some online-based examinations (Bhagat et al., 2016) as a large number of existing studies in the broader literature have examined online-based assessments and they pinpoint that nearly 80% of the surveyed examinations showed misconduct and malpractice during the examinations (Witherspoon, Maldonado & Lacey, 2012; Hylton, Levy, & Dringus, 2016; Mellar, Peytcheva-Forsyth, Kocdar, Karadeniz, & Yovkova, 2018; Bilen & Matros, 2020; Bhagat, Wu, & Chang, 2016; Witherspoon, Maldonado, & Lacey, 2012; Karim, Kaminsky, & Behrend, 2014; Udechukwu, 2020).

There are also works of literature that ponders on certain concerns for e-proctoring as they posit that the cost-effectiveness of e-proctoring devices makes it difficult for most educational institutions to acquire, others complain that the use of e-proctoring may induce stress and text anxiety (Song & Luximon, 2020), some literature suggests that examinations should be carried out in conducive environments where the affective filter is reduced to a minimum (Ironsi, 2017) and this aligns with other literature that indicates

that the use of proctors for examination may induce stress and anxiety which would affect the academic performance of the test takers (Regehr & Goel, 2020; Song & Luximon, 2020). Proctoring devices have become essential in these challenging periods where most institutions have switched to remote online learning, and there is a need to assure test takers and the entire academic community that online-based assessment would be of high quality devoid of malpractice and cheating. For instance, recent research suggests that the higher education Opportunity act of 2008 in the United States of America mandates all universities to ensure and verify the identities of test-takers to ensure that those who register for online courses are the same individuals participating throughout the course duration (Kraglund-Gauthier & Young, 2012), this is a measure to help reduce impersonation and cheating in online-based instructions and assessments. Again, it is important to state that some private companies are already utilizing proctor's software for profit maximization without adequately considering ethical related issues – this creates more issues for debate. Many may argue that the use of e-proctoring has not erased the issue of cheating or malpractice in online examination (Karim, Kaminsky, & Behrend, 2014; Udechukwu, 2020; Lee, 2020). While educational institutions may claim to have achieved success in supervising and administering credible, transparent examination through the use of e-proctoring software, a lot of controversies and criticisms have emerged recently (White, 2020). The focal point of this disagreement hinges on issues of ethical credibility of e-proctored software and technologies, its appropriateness for use in administering online-based examinations, especially in hybrid/ EROT model scenarios. There is numerous evidence in literatures that points to issues of cheating in online-based examinations (Hylton, Levy, & Dringus, 2016; Bilen & Matros, 2020; Bhagat, Wu, & Chang, 2016), which in turns affects academic integrity. The use of e-proctored devices requires technological devices and internet connections which its availability may vary with test-takers. Poor internet connection which disconnects may void online-based examinations (Swauger, 2020).

However, while a recent study claims that e-proctored examinations are better than traditionally invigilated examinations which many presume is filled with cheating and malpractice (Dimeo, 2017), there are possible uncertainties with regards to how artificial intelligence may detect and identify a "cheating behaviour". Numerous e-proctoring websites have explained how they compute "red flags" to detect cheating yet it is difficult to ascertain how reliable a man-made technological configured device may attain 90% efficiency in detecting cheating behaviours or misjudging behaviours as cheating (Swauger, 2020; Peters, 2020; Buolamwini & Gebru, 2018). Another issue is privacy, privacy seems a broad philosophical issue and the use of e-proctoring software for online-based examinations raises more ethical and moral concerns on privacy-related laws and policies

which may not be addressed by institutions. Much more, certain legal authorities may possess privacy laws that have not been adequately formulated to cover areas of data collection, data storage, image capturing, and biometric identities of test-takers. These ethical, moral, privacy-related issues and many more are serious issues of debate that needs to be addressed to maintain transparency, credibility while administering and monitoring online-based examinations using e-proctoring software. The main problem is that the lockdown as imposed by the government would not allow for face-to-face invigilation of examinations as has been the case before the outbreak of the Covi-19. There is a further problem with using only assignments, presentations, or end-of-term projects as means of measuring students, there is also a need to test, measure, and grade their performances afterward (Cheng et al., 2020). This seems to be a common problem as online examination needs to be credible, properly monitored, valid, and reliable enough to measure learning outcomes, and where this is impossible, problem arises with regards to the quality of educational instruction (Sutton, 2019). This study anticipates that there is a need for schools to be prepared for the post-COVID-19 semester to be able to deliver quality educational instruction and also to administer credible valid and reliable examinations that are properly monitored to promote academic integrity.

The present study

However, while a lot has been written on proctored examinations, very limited studies cover these arrays of issues with regards to conducting and monitoring credible, transparent, and reliable online-based examinations. Also, studies have not discussed the use of proctored applications like *safe exam browser* for administering examinations during a hybrid/emergency remote online teaching scenario. The practical contributions of e-proctored examination through utilizing Safe Examination Browser (SEB) in ensuring credible and reliable examination in a hybrid/EROT educational model is yet to be properly investigated. There is no previous research that has investigated the use of an e-proctoring approach to online-based examinations, especially while using a hybrid/emergency remote online based instruction and this remains an area to be investigated. As far as we know, little or no previous research has examined the successes and possible challenges of utilizing e-proctoring software for monitoring examinations, especially during hybrid/ emergency online learning.

Furthermore, other studies have examined the use of proctoring software for online-based examination but have failed to discuss its use for emergencies, ethical related issues, and the results achieved so far have not been thoroughly examined. One way to overcome these gaps in literature is to examine critically the use of e-proctoring software for monitoring examinations in a hybrid/emergency remote online-based instruction, to unveil the

successes achieve and challenges as well. This study anticipates that there is a need to investigate the utilization of e-proctored software like SEB while administering and monitoring examinations during the post-pandemic semester. This will give much insight into the future of organizing more credible, properly-monitored, transparent, and reliable examinations for post-pandemic education through the use of proctored software. Importantly, this study would document several key contributions that would be made to the fields of education with a special focus on areas of measurement and evaluation. This study will make several significant contributions to the field in showcasing instructors' and students' opinions on the utilization of proctors for administering and monitoring online based examinations, especially in a hybrid educational model. To achieve these the use of the following research questions was investigated:

- What is the perception of preservice teachers on the efficacy of e-proctoring software for monitoring examinations?
- What are the opinions of instructors on the effectiveness of e-proctoring software for examinations?

Method

Research Design

The study adopted a quantitative research design that makes use of questionnaires in eliciting information from participants with regards to their views and opinions on an issue (Black, 1999). This research design was deemed suitable for this study as it will make use of questionnaires in eliciting information from teachers and students on the use of e-proctoring for emergency remote online-based instruction. The study employs the use of *Safe Exam Browser* which is an e-proctoring software using for monitoring online-based examinations. This software was utilized for monitoring examinations during the Fall semester. This software was used during the remote online-based instruction for midterm examinations and summative assessments. The period of instruction delivery lasts for 15 weeks, midterm examinations were conducted after 7 weeks for 1 week afterward the summative assessment lasted for 2 weeks. All the assessments were administered utilizing the safe exam browser as a proctor for monitoring the examinations.

Participants

The participants comprise 36 preservice teachers and 4 language instructors. They were chosen through a purposive sampling technique majorly for this study as the objective of the study was to elicit information from preservice teachers and instructors on their perception of the use of e-proctoring for emergency remote online-based assessment. These

participants were chosen from a private university in North Cyprus after agreeing to participate in the study, they also gave oral consent to participate throughout the study.

Data Collection

A structured 15 itemized questionnaire was the main instrument for data collection. This instrument was structured on a 5 point Likert type scale of *Strongly Agree* (5) *Agree* (4) *Neutral* (3) *Disagree* (2) and *Strongly Disagree* (1). The instrument was face validated by two experts in the field of education who examined the questionnaire items to carry out a superficial assessment of question items before administering the same to participants. The face validation leads to the rewording of some items and a final version of 15 items was obtained. The items were piloted with 10 students who were randomly chosen to determine the reliability of the instrument and a Cronbach alpha index of .86 was obtained affirming that the items were consistent in measuring the opinions of the participants on the use of e-proctoring for emergency remote online-based instruction. Afterward, this instrument was administered to all the participants and collected for analysis.

Data Analysis

After administering the questionnaire, the researcher collected the instrument and analysed the same using SPSS analytical tool to carry out descriptive analysis to ascertain the mean responses of the participants on the various items of the questionnaire. The results obtained were organized in tables and presented below;

Result and Discussion

This section summarizes the findings and contributions obtained after the analysis of the data collected, they are presented according to the research questions and in tables.

Table 1:   The perception of preservice teachers on the efficacy of e-proctoring for monitoring examinations

Scale	N	M	SD
Examinations are usually credible using e-proctor software	36	2.02	1.48
Using e-proctors erases cheating and malpractice	36	2.55	1.44
Test takers are relaxed while sitting for examinations	36	2.72	1.38
Overall evaluation progress becomes transparent	36	4.15	0.52
E-proctored examination are seen as valid methods of evaluation	36	3.02	0.56
An E-proctored examination is highly reliable	36	2.45	1.62
Administering reliable examinations during emergencies are possible	36	4.45	0.68
E-proctored examination improves the integrity of instruction	36	4.60	0.42
Anxiety levels are minimal while conducting e-proctored exams	36	2.17	1.55
A conducive environment for evaluation is fostered in e-proctored exams	36	4.55	0.45
E-proctoring software enhances auditory and visual surveillance	36	4.68	0.52
E-proctored software is affordable	36	1.88	1.78
Issues of impersonation are tackled through e-proctored evaluations	36	4.95	0.72
Students are bothered about the safety of their privacy &personal details	36	4.92	0.69
Test takers are bothered about invasion into their computers	36	4.78	0.66

The table presents the mean values on preservice teachers' perception of the use of e-proctoring for monitoring examinations. The result showed that the preservice teachers did not perceive examinations to be credible using e-proctor software neither did they affirm that using e-proctors for examination erases cheating and malpractice, rather they thought that test takers were not relaxed while sitting for examinations as a mean value of 2.02 (SD 1.48), 2.55 (SD1.44) and 2.72 (SD1.38) was obtained for these items. However, they thought that using e-proctoring enhances transparency in the evaluation process, a mean value of 4.15 (SD 0.52) was obtained for this item yet they were neutral when asked if e-proctored exams are seen as valid methods of evaluation, a mean value of 3.02 (SD 0.56) was obtained. They were affirmative that the e-proctored examination was not reliable, a value of 2.45 (SD 1.62) was obtained for this item.

Moreover, they perceived that using e-proctors makes it possible to administer examinations during situations of emergency and improves the integrity of the entire instruction, a mean value of 4.45 (SD 0.68), and 4.60 (SD 0.42) was obtained for these items. Again, the results indicate that the teacher believed that anxiety levels were not minimal during e-proctored examinations even as they affirmed that using e-proctored software for examinations creates a conducive environment that fosters the use of auditory and visual surveillance while administering a test, with mean values of 2.17 (SD1.55), 4.55 (SD 0.45) and 4.68 (SD0.52) was obtained for these items. When the teachers were asked to indicate if e-proctor software is affordable, a negative response was obtained with a mean value of 1.88 (SD 1.78). With regards to impersonation, the participants thought that impersonation related issues were tackled while administering an e-proctored examination, a mean value of 4.99 (SD 0.72).

Table 2: The opinions of instructors on the use of e-proctoring for examinations

Scale	N	M	SD
Examinations are credible using e-proctor software	4	2.32	1.18
Using e-proctor erases cheating and malpractice	4	4.26*	0.50
Test takers are relaxed while taking examinations	4	1.41	1.93
Overall evaluation progress becomes transparent	4	1.11	1.85
E-proctored examination are seen as valid methods of evaluation	4	1.62	1.70
An E-proctored examination is highly reliable	4	2.42	1.42
Administering reliable examinations during emergencies are possible	4	4.05*	0.78
E-proctored examination improves the integrity of instruction	4	3.10	0.73
Anxiety levels are minimal while conducting e-proctored exams	4	2.07	1.45
A conducive environment for evaluation is fostered in e-proctored exams	4	2.34	1.62
E-proctoring software enhances auditory and visual surveillance	4	4.66*	0.47
E-proctored software is affordable	4	3.03	0.68
Issues of impersonation are tackled through e-proctored evaluations	4	4.15*	0.82
Students are bothered about the safety of their privacy & personal details	4	4.65*	0.74
Test takers are bothered about invasion into their computers	4	4.72*	0.81

Table 2 above presents the opinions of instructors on the use of e-proctoring for examinations. The findings indicate that a mean value of 2.32 (SD 1.18) was obtained when the participants were to indicate if examinations conducted using e-proctoring were credible, this response indicates a negative notion on the credibility of e-proctored examinations. However, they affirmed through their responses that the use of e-proctoring during examination erases issues of cheating and malpractice as a mean value of 4.26 (SD 0.50) was obtained for this item. Clearly, the results show that the participants thought that test-takers were not relaxed during examinations, the evaluation process was not transparent, not valid, not reliable as a mean value of 1.41 (SD1.93), 1.11 (SD1.85),1.62 (SD1.70), and 2.42 (SD1.42) were obtained for these items. However, the results indicate that the instructors were positive that administering reliable examinations in emergencies was possible through the use of an e-proctored examination, a mean value of 4.05 (SD0.78) was obtained for this item. They were neutral on the integrity of instruction using e-proctored examination, a value of 3.10 (SD 0.73) was obtained for this item. Similar to the response of the students, the result shows that the instructors believed that anxiety levels were not minimal during exams conducted using e-proctors nor did the e-proctored exam ensure a conducive environment for evaluation, a mean value of 2.07 (SD 1.45) and 2.34 (SD 1.62) was obtained. They were neutral with regards to the affordability of e-proctor software as a mean value of 3.03 (SD 0.68) was obtained for this item. They were affirmative that the use of e-proctoring enhances auditory and visual surveillance as issues of impersonation are tackled as well, a mean value of 4.66 (SD0.47) and 4.15 (SD 0.82) was obtained for these items.

Discussion

From the short review above, key findings emerge: The notion that e-proctored examination is usually credible were debunked as the participants thought otherwise, Contrary to the findings of some studies (García-Peñalvo, Abella-García, Corell, & Grande, 2020; Woldeab, Lindsay, & Brothen, 2017; Cramp, Medlin, Lake, & Sharp, 2019), we did not find any corroboration that suggests so. Our findings at least hint that there could be a possibility that the use of an e-proctor for monitoring examination could eliminate the issue of malpractice, impersonation though the issues of transparency or integrity of instruction could not be ascertained. A further novel finding is that issues of anxiety, ethical issues, privacy-related issues, validity, reliability, and affordability of e-proctor software continue to be an issue to ponder. The findings of this study were contrary to the suggestions of similar studies which opine that e-proctored examination are credible, valid, reliable, and affordable means of conducting a quality examination that is devoid of anxieties or stress (Davis, Rand, & Seay, 2016; Kayser, 2016; Karim et al., 2014; Li, Chang,

Yuan, & Hauptmann, 2015; Udechukwu, 2020). While the teachers were affirmative that the use of e-proctoring erases cheating the students thought otherwise. This finding contradicts the assertion of some studies which posit that the utilization of proctor erases cheating and malpractice during online-based examinations (Woldeab, Lindsay, & Brothen, 2017; Kayser, 2016; González-González et al., 2020) while buttressing the points of some authors who have argued that the use of proctors has not eliminated cheating and malpractices during online examinations (Witherspoon, Maldonado, & Lacey, 2012; Hylton, Levy, & Dringus, 2016; Mellar, Peytcheva-Forsyth, Kocdar, Karadeniz, & Yovkova, 2018; Bilen & Matros, 2020; Bhagat, Wu, & Chang, 2016; Udechukwu, 2020). Also, the present study to an extent confirmed the findings of other studies which suggest that e-proctored examinations are usually suitable for emergencies, as the environment for conducting such examination are conducive as plugins for auditory and visual surveillance were used (Daffin Jr & Jones, 2018; Bandyopadhyay, Barnes, & Bandyopadhyay, 2015; Lilley, Meere, & Barker, 2016; Song & Luximon, 2020). True as it may seem, care must be taken to ponder on the reason why an examination conducted in a conducive environment breeds anxiety and stress on the examinees, this is another area that needs further investigation. The results demonstrate two things; first, though e-proctoring was useful in administering examination during an emergency, the level of its credibility, validity, and reliability is to a large extent yet to be addressed, though this could be contextual as well. Second, the result affirms that there is a need for re-evaluation of e-proctoring software as ethical and privacy-related issues are yet to be critically addressed.

Conclusion and recommendation

The objective of the study was to elicit information from teachers and students on the use of e-proctoring software in administering assessments, in conclusion, it would appear that e-proctor software plays a paramount role in ensuring that test takers do not engage in examination malpractice during online examination yet more efforts need to be made towards improving this software ensure more reliability and validity of evaluations conducted using these platforms. The paper concludes by arguing that though a lot of literature exists on the positive roles of e-proctoring in online examinations, the authors concluded that its usefulness needs to be re-evaluated to ensure wider coverage especially with regards to its use for valid credible, and reliable examinations. This allows the conclusion that e-proctoring plays a paramount role in conducting an online examination, especially in emergencies though careful efforts must be made to ensure that this software is overhauled and used in a way that does not induce fear, trepidation, or anxiety on test-takers. This may be considered a further validation for the re-evaluation of the software which will lead to redeveloping other areas that require enhancement. Broadly translated our findings indicate that while teachers may consider some positive sides of using e-

proctoring for monitoring examinations, the students did not perceive the software as a useful tool for examination supervision or monitoring. The students were more concerned with the biometrics features of e-proctoring software, questions of where their details are stored, and privacy right related issues that were yet to be resolved. It is difficult to arrive at any conclusions concerning variations in opinions and perception of the participants in this regard yet despite the limitations these are valuable in light of the positive role of e-proctoring software as viable tools for conducting online examination especially in emergencies which was the case during the COVID-19 pandemic outbreak.

Limitations

The major limitation of this study was the sample size of the participants which was relatively small. The outbreak of the pandemic made a lesser number of students enrol for studies for the fall semester. We affirm that a larger sample size could produce different findings on the same topic. Another limitation was the inability of the study to investigate the perception of instructors and students from other universities instead of choosing only one particular university. We believe that different results may be obtained if the study investigated the opinions and perceptions of other instructors and teachers at other universities. This study was a perception-based study and like every other perception-based study, perceptions of participants can be influenced by other groups and this may affect the results obtained.

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