

INTRODUCTION

The National Open University of Nigeria is the latest in the line of institutions offering distance learning programmes in Nigeria aside those few that are dual mode institutions. It is the first single mode open and distance learning university in the West African sub-region. It was initially established in 1983, but was suspended nine months later due to modifications in government policy. In 2002 the National Open University of Nigeria was resuscitated to meet the huge gap in application and admission statistics of Nigerian universities. The University took off with about 78 programmes at the Proficiency Certificate, Certificate, Diploma, Bachelors, Postgraduate Diploma, and Masters levels under four schools and one centre, viz: the Schools of Arts and Social Sciences; Business and Human Resources Management; Education, and; Science and Technology as well as the Centre for Continuing Education and Workplace Training. The University currently has 107 study centres spread across the six geopolitical zones of the country. In addition to these, the university has its Headquarters located in Abuja, a planning office at Lagos and an Educational Technology Centre at the Kaduna Campus.

The COVID-19 pandemic that ravaged every facets of human endeavours in the recent years have seriously made it mandatory for institutions of learning right from kindergartens to all other levels to pitch their tents with technological innovations of Online teaching and learning with examinations being done virtually using various methods of technological devices and means of examining learners. Since National Open University of Nigeria is an institution which hinges its functionality on various devices of technology, facing the screen to write examinations virtually was an option using the adequate cadgets. As observed, the covid-19 pandemic has inadvertently, increase the rise of e-learning and has also helped to encourage students to take on more responsibility for their own acquisition of knowledge (Ituma,2011) and thereby open the world to virtual examinations more than before.

Although assessment of learning outcomes encompasses a range of activities such as testing, performances, project ratings, and observations as remarked by Orlich, Harder, Callahan & Gibson (2004), it is not all that can be examined through e-assessment. Many requires other assessment skills it is a fact that assessment is an ongoing process that involves planning, discussion, consensus building, reflection, measuring, analyzing in tandem with the learning objectives. E-assessment adoption in NOUN is a way of dealing with the encumbrances that militates against confirmation of learning outcomes. Also without mincing words, assessment in the life of institutions is one of the bases for quality assurance and acceptability in the society as it is through it that learning outcomes that confers rate and level of knowledge and skills on learners are established. As observed by Haken (2006) and confirmed by Okonkwo (2013), assessment is an integral piece to assuring that an educational institution achieves its learning goals, as well as a crucial means of providing the essential evidence necessary for seeking and maintaining accreditation. Hersh (2004) also reiterated that assessment of students learning should be considered an integral part of the teaching and learning processes as well as part of the feedback loop that serves to enhance institutional effectiveness. It is therefore important that open and distance

learning institutions whose students are always multiple in numbers unlike the conventional institutions should get their mode of assessment right in order to show their readiness to compete with other institutions of learning as this singular act will be a plus during their institution's programme accreditation by the body saddle with accreditation responsibility, shore up their level of credibility and finally acceptance in the society.

Love & Cooper (2004) opined that good assessment serves multiple objectives and also benefits a number of stakeholders while Dietal, Herman, and Knuth (1991) remarked that assessment provides an accurate measure of students' performance to enable teachers, educators, and other key decision makers to make effective decisions. To buttress the above assertions, Kellough and Kellough (1999) identified seven purposes of assessment; which must be of good standard as: i. Improve student learning; ii. Identify students' strengths and weaknesses; iii. Review, assess, and improve the effectiveness of different teaching strategies; iv. Review, assess and improve curricular programmes; v. Improve teaching effectiveness; vi. Provide useful administrative data that will expedite decision making; and vii. Communicate with stakeholders.

It is therefore pertinent that institutions of learning in anticipation of events like the experienced covid-19 pandemic or with either multiple of hundreds and thousands of students at their various levels and different programmes such as open and distance learning system should seize the advent of ICT and the development of various kinds of software as it apply and relates to issue of examinations in their institutions in this modern day. NOUN ascribes much importance to this hence the decision to adopt a technological solution to the issue of assessment and evaluation as it relates to the examination of its students due to the number of registered students and by extension the advent of covid-19 pandemic.

In National Open University of Nigeria the main goal of deployment of technology in assessment of students learning outcomes is to harness the benefits of ICT in overcoming the challenges encountered in the total management of examinations due to the pandemic and by extension those courses in which huge numbers of students are involved. This experience has done both the staff and the generality of the students' lot of good. The eAssessment to some extent has moved the conduct of examinations in the university forward, it is not without its frustration but the surmountable frustrations are challenges that come up during the process.

DESCRIPTION OF THE VIRTUAL EXAMINATIONS ADOPTED TECHNOLOGICAL DEVICE

Authentication		Testing Environment			Test Grading	
System	ID	Exam Platform	Proctoring Assured	Manual	Automatic	
<ul style="list-style-type: none"> • Internet (156Kbps) • Webcam • Screen shared • System Mic Enabled 	<ul style="list-style-type: none"> • NOUN Student Face Verification • NOUN Student ID • Student Matric number 	<ul style="list-style-type: none"> • Secure Browsing <ul style="list-style-type: none"> ○ Browser Lock ○ Full Screen invoked ○ All other Computer applications locked • Keyboard shortcut lock <ul style="list-style-type: none"> ○ No Copy and Paste (Ctr +C) ○ All other keyboard combination locked 	<ul style="list-style-type: none"> • Artificial Intelligence (AI) based <ul style="list-style-type: none"> ○ Flag attempts on several looks away from exam window ○ Flag/Block attempt to navigate away from exam window ○ Flag/Block any keyboard combination • Human proctoring also enabled <ul style="list-style-type: none"> ○ Listen to all student background ○ See student live feed ○ Chat with Student if there is any anomaly detected ○ All record session can be reviewed and 	<ul style="list-style-type: none"> • All Essay exams are marked in secure environment • Mark are allotted to each question • Marker have no access to student detail to guarantee integrity • Scripts are securely stored 	<ul style="list-style-type: none"> • Immediate feedback is supplied to student upon completion • Marks obtained is view by the student as feedback • Grade Analysis can be made 	

			flag student will be easy identified		
Before Exam Commencement		During Exam	During Exam	After Exam	After Exam

OBJECTIVES/PURPOSE OF THE STUDY

The objective of this paper is to share the experience this mode of examinations entails and for the purpose of discuss that can lead to its improvement. This is with a view to sensitize the management of ODL institutions especially in the developing countries on the need to adopt the method of examination due to the inherent advantage it portend and also to reveal the fact that basic computer literacy course as a fundamental ‘general study course’ should be taken by every ODL student to adequately prepare them for their effective participation in the digital future which requires IT skills . The following three research questions guided the study

1. What is the view of NOUN students on the computer literacy preparedness level in relation to virtual examination method adopted by the University
2. What are the perceptions of the NOUN students about virtual examination method adopted by the University?
3. What is the perception of the Academic staff of NOUN about virtual examination method adopted by the University?

POPULATION AND SAMPLE

The two different samples used for the study were drawn amongst the returning students of Lagos and Abuja study centres who had experienced the virtual examinations and the academic staff who had participated in setting of both virtual assessment and paper and pen examination questions in the university. 75 students participants while the number of academic staff that made up the second sample was 23 with each school having four representatives.

METHODS/PROCEDURES

This study employed survey research design. The data for the study was collected using multi-methodology-research method approach wherein questionnaire was administered on the student samples while the academic staffs were interviewed..

DATA ANALYSIS

The distribution of the student’s sample of the study in relation to gender and age range and percentage on required computer literacy level and perception about virtual examination method is given below in table 1

Demographic characteristics of the participants and their percentage score in relation to their perceptions and views on required computer literacy level in relation to virtual examination method of the University

Table 1: Gender and Age differences of the Sample

AGE	20-30	31-40	41-50	51—ABOVE
NUMBER(N)	35	20	12	08
Gender	F= 20 M=15	F= 10 M=10	F=8 M=04	F=03 M=05
%age	46.66	26.66	16	10.66

The population of the participating students is more in the 20-30 age bracket (35;46.66%) followed by 41-50 (20; 26.66%). Age 31-40 has (12; 23.33%) while 51 and above is (08;13.3%).

This showed that large percentage of students of the university that took part in the virtual examinations are of digital native made up of young group which is 20 - 30 (35;46.66%) while 31- 40 (26.66) followed. These are category of students who are in tune with the need for technological pedestal required as a vehicle to run the ODL institutions. They are those who benefit much from the flexibility and other characteristics of the open and distance learning institutions. The population of the very relatively old age group is 12 (16%) while those that can be categorised as very old; 51 years and above is made up 08 (10.66%). This shows that the university is really taken care of the young fold who are expected to actually be in the conventional university if not for the problem of access created mostly by difficulty in securing admissions and also the old who must have denied the privilege of attaining university degree. The picture portray by gender composition of the participant also revealed that gender inequality was taken care of by the university because in all categories of age difference the proportion of both male and female students is quite close hence the institution in all ramifications is open to all.

The subjects used for the study were requested to respond to some survey items in the administered questionnaire to reveal their perception and the required computer literacy level as it relates to virtual examination method of the university. The table 2 below therefore, provides information that describes the NOUN students' perception and what is perceived to be the required computer literacy level expected of students as it relates to the virtual examination methods adopted by the university.

Table 2: Percentage responses of the subjects

S. No.	ITEM	YES	NO
A	COMPUTER LITERACY		
1	Student must be able to put on and put off the computer before he/she can partake in virtual examination	64 88%	09 12%
2	Partaking in virtual examination require ability to type words with computer	72, 96%	03, 4%
3	Students must have e- mail address to be able to attempt virtual examination	75 100%	0 -
4	Students must know how to browse the internet before he/she can take virtual examinations	75, 100%	0, 0%
5	I need resources from the internet during virtual examination	0, 0%	75, 100%
6	Student should have participated in on- line chat before he/she can sit for virtual examination	03, 4%	72, 96%
7	I don't need to be computer literate at all before I can take part in virtual examinations.	0, 0%	75, 100%
8	I need not to be perfect in on-line learning to be able to take virtual examination.	67, 89%	8, 11%
9	I need to have sound knowledge of different search engines before I can take part in virtual examination.	0 0%	75, 100%
10	I require the knowledge of Power point before I can take virtual examinations	- 0%	75, 100%
B.	PERCEPTION OF VIRTUAL EXAMINATION METHOD		
1	virtual examination eliminate the problem of delay in writing examinations	75, 100%	- 0%
2	Virtual examination will enable us finish our programme to time.	68, 82%	07, 8%

3	The Virtual examinations will help sort out the issue of missing results	75, 100%	-, 0%
4	The university will need to encourage more students so that more students can be attempting their examinations through this platform.	49, 65%	26, 35%
5	Computer training should be part of the courses we will register for in order to equip us for the virtual examination.	69, 91%	7, 9%
6	Virtual examination allow students to attempt their examination in a relaxed atmosphere devoid of harassment from supervisors	66, 88%	9, 12%
7	Virtual examination reduces the level of paper work required during examinations	73, 97%	2, 3%
8	It reduces examination malpractices on the part of students and the lecturers as culprits are caught electronically	75, 100%	-, 0%
9	Virtual examination will alleviate the problem of students with poor hand writing	73, 97%	2, 3%
10	I prefer virtual examination to the pen and paper examination	69, 91%	7, 9%

Academic Staff interview

Individual interviews were conducted with 18 members of academic staff selected on the basis of being a participant in setting of both virtual and paper and pen examination questions in the university. The participants were drawn from the six schools. Each interview session lasted between 30-45 minutes. Interview questions responded to by these samples include belief about technology, experience in the use of computer, enabling environment, computer knowledge, individual perception and training.

RESULTS AND DISCUSSION

Research question 1: What is the view of NOUN students on the computer literacy preparedness level in relation to virtual examination method adopted by the University?

The table 2 above shows that 64 or 88% agreed that a student must be able to switch on and off the computer before he/she can partake in virtual examination; 72 or 96% confirm that partaking in virtual examination requires ability to type words with computer 75 or 100% agreed that a student does not need to have e- mail address to be able to attempt virtual examination while 75 or 100% believe that student must know how to browse the internet before he/she can take virtual examinations. 75 which made up the entire sample population agreed that student do not need resources from the internet during virtual examination or else the students must be on cheating spree in that situation; 67 or 89% also confirmed that student does not need to have participated in on- line chat before he/she can sit for virtual examination. In order to participate in virtual examination, 75 or 100% of the sample believe that a student needs to be computer literate before he or she can take part in virtual examinations. Amongst the entire samples of the study, 75; 100% agreed that students do not need to have sound knowledge of different search engines before he or she can take part in virtual examination. Lastly, the entire sample agreed that a student does not require the knowledge of Power point before he or she can take e-assessment examinations. What could be deduced from this result is that students require

only basic knowledge and skill in computer literacy to be able to sit for virtual examination. Virtual examination is therefore a panacea to the delay and disturbances caused by the COVID -19 pandemic. Virtual examination method would come handy for teachers to evaluate their learners anytime there is observable delay or disturbances during the teaching and learning process in institutions of learning. It could be formative or summative evaluation. The exposition of students will enhance their ability and increase their literacy level. Such computer exposition and training will broaden their knowledge. In tandem with this assertion are research evidences that suggested that training significantly reduces anxiety and increases confidence in computer use (Colley et al., 1994; Gressard & Loyd, 1986; Torkzadeh & Koufteros; 1994).

Research question 2: 2. What are the perceptions of the NOUN students about virtual examination method adopted by the University?

From the table 2, the entire sample agreed to the fact that virtual examination eliminates the problem of delay in marking of scripts and allows candidate to know the examination score as soon as the paper is over provided the institution wants to release the result immediately; 68 or 82% of the sample agreed that virtual examination will enable them to finish their programme to time. The entire sample also has the belief that the virtual examination will help sort out the issue of missing results. 49 or 65% of the sample population agreed university will need to encourage more students on the need to be writing their examinations virtually so that increasingly, more students can be attempting their examinations through the virtual platform while 26 or 35% disagreed. This may have to do with concern for those who are not versed in the use of computer. But with the introduction of basic computer course as part of the courses in which all students must registered for, the fear expressed will be addressed. Same token same analogy, 61 or 91% of the sample is of the opinion that computer training should be part of the courses we will register for in order to get learners equipped for the virtual examination and 66 or 88% of them agreed that virtual examinations allow students to attempt their examination in a relaxed atmosphere devoid of harassment from supervisors though the proctoring of the examinations will catch whoever is cheating during the period of examinations but truly there will be no human harassment. 73 or 97% also revealed that virtual examination reduces the level of paper work required during examinations. The entire sample also agreed that the virtual examination reduces examination malpractices on the part of students and the lecturers since the proctor would be warning the student moment there is discovery of any funny move including the sanction that will follow in the immediate in which there is no immediate reversal. Perception of many as high as 73 or 93% of the sample is of the view that virtual examination will alleviate the problem of students with poor hand writing. In totality, 7 or 9% of the sample prefer pen and paper examination while 68 or 91% of the samples prefer virtual examination. The results here revealed that the students accept the mode of examination and perceive the examination in high regard. They prefer it to the pen and paper examination. This might also underscore the believe that virtual examinations will enabled the flexibility that could encourage writing examinations from abroad , especially those that have reasons to travel abroad officially or otherwise as long as they are qualify to write the examination having fulfilled all the spelt out requirements.

Research question 3: What is the perception of the Academic staff of NOUN about virtual examination method adopted by the University?

The conducted individual interviews elicited responses from the samples. All the samples candidly express their views. On the issue of training, the samples are of the opinion that the computer training which exposes them to the mode and method of question setting for the for virtual and e-assessment method really help their adaptation. This singular act according to them reduced their anxiety and erased the fear and ill feelings many had harboured. Many (18; 78%) also confirmed that they were highly computer literate before joining the university and they have also received various computer trainings while in employment of the university. Those (5; 22%) who were not so highly computer literate before joining the university claimed to have improved tremendously due to exposure through trainings. On the issue of belief about technology, they all consented positively to the fact that the ODL mode which is a shift in paradigm from the conventional mode which everybody were used to before now is highly driven by technology and the knowledge they have been exposed to and acquired by being involved in different things that are done in the university system through Information technology has made them to be aware of the fact that technology can help mediate activities and resolve lots of problems when it concerns the issue of teaching and learning. Lastly on the individual perception of the virtual examination method adopted by the University for the Semester Examinations of their very large number of students, the responses were in the affirmative. The academic staffs belief that adopting the e-assessment examinations suit the university for its advantages and also for the value it add to the university services. The virtual examination is seen as a welcome development and also as an innovation considering the cover it gave to the university in the time of COVID-19 pandemic and also looking at many pitfalls the pen and paper examination has generally and especially when it involves a large number of candidates going to the tune of tens of thousands. The traditional examination is noted to be plagued with several issues that bother on irregularities such as allowance for impersonations, inadequate supervisors, question paper leakages, influencing of scores through payment of gratification to markers and bribing of supervisors or invigilators. Others are delay of release of results, non-release of results and missing of results which is common to examination that involves a very large number of candidates. As the examination mode suits the modern day time in all ramifications, so also is its adoption has some implications for those who would work with it and through it. As succinctly put by Attewell (2005), electronic assessment examination will amongst others, (a) offer a reduction in the time spent in marking, it will for these reasons shift the focus of effort, which is usually very tedious, for staff or lecturers to before rather than after the examination period. This is because preparations for e-examinations (such as setting, scripting, uploading, etc.) are very tedious, time consuming and tiring. (b) require questions in item banks to be assessed and indexed so that each student experiences a test of equal measure to their ability, regardless of the combination of questions presented to them in a randomly generated test. (c) require setting up of a viable physical and IT infrastructure to support e-examination to the required scale. (d) require instituting policies and procedures to ensure the validity of e-examinations. (e) require alternative provisions for the problem of a technical failure on the day of examination especially in the developing countries that experience poor electricity supply.

Aside the above challenges, the challenges that may be expected to face the deployment of e-assessment examination method mostly in developing countries like Nigeria are inadequate electricity supply, inadequate Information Technology facility tools such as the computers and also the level of illiteracy in the use of computer which is still on a wide scale among the teachers and the students. Nonetheless the problems are surmountable if institutions are ready to take to electronic examination method due to its inherent benefit.

CONCLUSION

Conclusively, considering the responses of the samples to the raised research questions as analysed, it is very glaring that the study support the use of virtual examination for the purpose of examining candidates obviously for the inherent benefit it portends. The students through their responses showed that the virtual and electronic mode of examination generally require a basic knowledge and skill in computer literacy in all ramifications and also revealed their preference for the examination which was perceived to possess characteristics which made it to be acceptable than the pen and paper mode of examination. Aside these, the responses of the academic staffs through the conducted interviews support the adoption of virtual examinations and other types of electronic assessment examination by the management of NOUN due to the advantages they believe it has over the traditional pen and paper examinations. Their positions on and perceptions of the mode of examination corroborate the position of the students regarding their perceptions of the virtual and other electronic assessment examination. This invariably means the students are ready to face the screen while sitting for their examinations in the place of traditional methods. Integrating these positions, it will be suggested that institutions be it conventional or ODL , either with multiple candidates in the region of tens of thousands and in readiness for taking care of students in diaspora should adopt the virtual and other electronic examination methods to carry out their semester examinations as the advantages and benefits would allow smooth examination coupled with the value it will add to their operations and services

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