

ENHANCEMENT OF STUDENT E-EXAM ASSESSMENT METHOD USING  
FACE RECOGNITION AND PSYCHOLOGICAL DISTRESS FACTORS

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requirements for the award of the degree of  
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*With much love, I dedicate this thesis to God Almighty and my adorable late father PA Julius Idemudia (May his soul rest in peace) and my financial supported Mother, my endless Pastor Goke Oladokun, Rev. Mr.Ojoko Edo Oga and members of the church who supported me and witnessed the successful completion of this thesis.*

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## ABSTRACT

Currently, electronic-exams scheme has been a very important module in education and teaching realm. Via education and teaching, countries are capable to build skills of their citizens, subsequently; connecting information divide within the country and with other established ones. Thus, there is a need for security control in the e-exam scheme. Security is a vital in e-exam as a web-based solicitation. Lack of trusted, secure and cheating free e-assessment is the main reason for unsuccessfully e-exams. The previous existing e-exam scheme in Nigeria University was using the combination of fingerprint biometric authentication and cryptographic dynamic. This guarantees that the candidate is the correct person on the other side in period of electronic-exams without a need for proctor. We propose a smarter and highly secured approach as a new finding which is the face recognition that will be introduced to enhanced authentication of candidate sitting for e-exam. It automatic the process and a proctor will not be required anymore. The system constantly with a less period of time rage, check for candidate identity throughout the exam time and to make sure the candidate who started the exam is the same person who will finished that exam so that can't be replaced by other person and to prevent cheating by looking at the adjacent computer and the system will generate an early alert once any suspicious movement will be notify by the system. It generates web authentication APIs, Image, Video, action matching and feature extraction. One of the research areas is the student distress related examination. Due to the rapid growth of technology, the students have to cope up with the E-Exams related stress. The present study will try to analyze the existing E-Exams system in Nigeria and their impact on students' distress. The main objectives of this study is to investigate and to analyze the existing student assessment methods of E-Exams system in Nigeria Universities in terms of additional security aspect of view; to develop an improve students assessment methods of E-Exams system by considering Psychological distress aspect. The proposed system has been presented to experts in addition to 29 students as respondent and to study the effect and the benefit of such system in e-exam atmosphere.

## ABSTRAK

Pada masa ini, skim elektronik peperiksaan telah menjadi modul yang sangat penting dalam alam pendidikan dan pengajaran. Melalui pendidikan dan pengajaran, negara mampu untuk membina kemahiran rakyat mereka, kemudiannya; menghubungkan jurang maklumat dalam negara dan jaringan yang ditubuhkan. Oleh itu, terdapat keperluan untuk kawalan keselamatan dalam skim e-peperiksaan. Memenuhi permintaan keselamatan adalah ciri penting di dalam e-peperiksaan berasaskan web. Kekurangan skim yang dipercayai, selamat dan berlakunya penipuan e-taksiran percuma adalah sebab utama untuk kegagalan pelaksanaan e-peperiksaan. Skim e-peperiksaan sedia ada di Universiti Nigeria; menggunakan gabungan cap jari pengesahan biometrik dan kriptografi dinamik. Ini jaminan bahawa yang diuji itu adalah orang yang betul dalam tempoh peperiksaan elektronik tanpa keperluan untuk proctor. Pendekatan yang dicadangkan adalah lebih bijak dan selamat menggunakan pengiktirafan muka sebagai penemuan baru yang diperkenalkan kepada pengesahan yang dipertingkatkan kepada calon yang menduduki e-peperiksaan. Ianya adalah proses automatik dan proctor tidak diperlukan lagi. Dalam tempoh masa e-peperiksaan, sistem sentiasa memeriksa identiti calon sepanjang masa peperiksaan untuk memastikan calon yang memulakan peperiksaan adalah orang yang sama yang akan selesai peperiksaan dan tidak boleh diganti oleh orang lain. Ini untuk mengelakkan penipuan pelajar dengan melihat komputer yang bersebelahan. Amaran awal akan terhasil untuk memberitahu sebarang pergerakan yang mencurigakan melalui sistem. Ia menjana API web pengesahan, imej, dan video dengan ciri pengekstrakan tindakan yang hampir sama. Salah satu bidang penyelidikan adalah peperiksaan yang berkaitan dengan kesusahan pelajar. Oleh kerana pertumbuhan pesat teknologi, pelajar terpaksa berhadapan dengan e-peperiksaan dengan emosi tekanan yang berkaitan. Kajian ini akan cuba untuk menganalisis sistem e-peperiksaan yang sedia ada di Nigeria dan kesannya terhadap kesusahan pelajar. Objektif utama kajian adalah untuk menyiasat dan mengkaji kaedah penilaian sistem e-peperiksaan di Universiti Nigeria dari aspek keselamatan tambahan dan penambahbaikan kaedah penilaian pelajar sistem e-peperiksaan dengan mempertimbangkan aspek psikologi kesusahan. Sistem yang dicadangkan telah dikemukakan kepada pakar-pakar dengan 29 pelajar sebagai responden untuk mengkaji kesan dan manfaat sistem tersebut dalam suasana e-peperiksaan.

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## LIST OF ABBREVIATIONS

AES	-	Advanced Encryption Standard
AK	-	Anonymity Key
AMF	-	Authentication Management Field
CANI	-	Computer for All Nigerian Initiative
CDMA	-	Code Division for Multiple Accesses
CDOUT	-	Out from concatenation of SQN and AMF
CK	-	Ciphering Key
DES	-	Data Encryption Standard
DOI	-	Diffusion of Information
EDI	-	Electronic Digital Interchange
EFCC	-	Economic and Financial Crime Commission
GSM	-	Global System for Mobile Communication
HSDPA	-	High Speed Downlink Packet Access
ICT	-	Information Communication Technology
IEA	-	International Energy Co-Operation and Development
IK	-	Integrity Key
ISPs	-	Internet Service Providers
LII	-	Local Information Infrastructure
MAC	-	Message Authentication Code
MTN	-	Mobile Telephone Network
NCC	-	Nigeria Communications Commission
NII	-	National Information Infrastructure
NITDA	-	Nigeria Information Technology Development Agency
NITEL	-	Nigerian Telecommunications
PTOS	-	Private Telephone Operators
SII	-	State Information Infrastructure



SPSS	-	Statistical Package for Social Science
SQN	-	Sequence Number
VOLP	-	Voice over Internet Protocol
VSAT	-	Very Small Aperture Terminal

**LIST OF SYMBOLS**

$\%$	-	Percent
$>$	-	Greater Than
$<$	-	Less Than
$>=$	-	Greater Than Equal To
$<=$	-	Less Than Equal To

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

A better assessment is vital for excellent lecturing. Superior coaching grants behavior for prospect inventions; however it is as well as persuaded by political strength and its reaction to social wants. The reason is that technology is shifting rapidly; in the year 1985 when the internet started and for now it is applicable everywhere around the world today. Positively places like the hotels in the Asian Pacific desert island Kiribati; social awareness with syllabus has arrived below tension as universal handling of supercomputers deviate from lecturing standard in education (Olawale Adebayo & Abdulhamid, 2014).

This is the background upon which the authors have opened up the use of e-Exams in their dissimilar countries. By e-Exams we mean the use of mainframes by applicants in a lofty chance managed assessment generally happening at the same time above a permanent duration of time. There are many other uses of computers in learning, and many other kinds of possible assessment. Learning content management systems are common for delivering learning materials over the world-wide-web and facilitating dispersed students. Assessing such learning using pen-on-paper exams can appear inappropriate to the students – but it often comes across. Coursework assessment, where students take a problem home for completion over a number of days is also widespread. High-quality assessment will frequently join this kind of loom with more recognized exams.

The present study will try to analyze the existing E-Exams system in Nigeria and their impact on students distress and to detect additional security biometric users authentication to be included in the existing system model/framework.

## 1.2 Background of the Study

The (ETC) which is the Electronics Testing Company is located in Lagos, Nigeria that has gone into the public, private and in joint venture with the Federal University of Technology Minna in 2010 that come into a conformity to put up a customary assessment midpoint, managing it and supply E-Exams for the epoch of ten years in which some of the staff in the University will be given a training to be responsible for the core when they depart. The Electronics Testing Company made up of two structures that which of the house are 250 dumb terminals and a detached server room and staff offices. The servers and dumb terminals are powered via an uninterrupted power supply. The server room contains a 22002200 American Power Conversion (APC) Un-interruptible Power Supply (UPS) that provides standby electricity in case of infrequent power failure, which is still rampant in the district. An additional gadget is 1TB CCTV system to reports the activities of applicants throughout the exams. A 24 port switch is used to connect the systems in the main buildings with the servers.

The software for arranging questions is premeditated with the graphical users interface that authorize the applicants before having right of entry to the question using the applicants individuality and registration numbers. And time stoppage is emotionally involved to the questions and the exams is involuntarily ended at the expiration of the given time. The given questions are arranged into the dumb terminals earlier to the starting of the exams and the applicants can spool all through every questions earlier to the end of the exams (Adebayo *et al.*, 2014).

The Electronic Examination scheme was used firstly in collaboration with organizational workstation in an IT courses as element of the Bachelor of Education courses in 2006. Applicants wader (ongoing) Schemes with CD-ROMs containing live Ubutu (Linux delivery) in Scheme laboratories run in transfer to survive with the bulky number of applicants. In due course, an expert programming endeavor changed the exits operating scheme to add up anti-collusion facial appearance and shifted from CD-ROMs to the USD firewood. The logic following this innovation was double.

Firstly, to construct a sustainable basis for the indispensable apparatus (every student brings along with them their personal computer during the time for any of them seating for Electronic Examination. Secondly, to make sure that impartiality of prospect via providing the matching operating schemes and appliance software set to carry applicant. During the time of drafting has been successfully use by more than 1000 applicants lofty venture assessments.

The Electronic Examination is a vast prospect for present existence and which has been seen as exponential development over the last decade. Thus, the apparatus that was used to current and manage this wants to be joined with proficient and dependable security apparatus to make sure that the average can be introduced as a reliable one. The identification, authentication and monitoring of e-exams candidates can at a remoteness are of major value in the sense that exams are managed by reasonable ways. The continuing approval of electronic exams as a perfect ways of investigating only students but also outlook job searchers in Nigeria was a good achievement. Thus, the non-reality of a worldwide customary for the design, accomplishment and exploitation of the software for managing the exams completed several of the challenges connected with the manual exams procedure determined.

### **1.3 Problem Statement**

Learning organization are growing rapidly and become more spirited and competent by renovating themselves into digital compacts, where almost all center business procedure and correlation with their customers are digitally facilitated. The connected transmutation of historically paper based assessment procedures is placed increased pressures on organization to look for an easier additional cost of faster way of designing, changing and keeping of the exam papers and communication, as well as performing exams and assessing students.

Earlier in the year 2010, the institution of higher education be talented to carry out a single two writing implement and paper assessment seeing as commencement unpaid toward need of ability in the direction of holding irresistible undergraduate inhabitants measure up with human and infrastructural necessities of that to keep fit. Possibility that National Open University of Nigeria End of academy session exams of 2010 which indicate National Open University of Nigeria has ninety thousand, seven hundred and sixty seven (90,767) register students and a total of one thousand and

twenty examinable courses. The courses and the students are extended to seven (7) schools and centers in the university and dispersed in thirty nine (39) study centers in all the thirty-six (36) states of Nigeria. This involves that if the entire register students as well register and sit for exams, the institution will be handling about one million (1,000,000) answer scripts multiplied by number of courses registered per student (AKUADI, 2011). The manual dispensation handwriting masquerade managerial frightening; Thus, assessment to discover potential of performing e-exams.

Although, the pros or cons perception about instructors relieve on skill uses and importance connected to usefulness of learning procedures has superior authority of their target towards survey the possibilities of expertise (Osang, 2012). However, what does the students consider regarding E-Exams? the fact that students approach in the direction of electronic learning behavior may perhaps be seen as the creation of their perceptions value of electronic learning and the level of technological complexity visualize come across while exploring the potentials of e-learning technology (Van Braak, 2004). In additional, the students have to think about the psychological distress perspective view of the E-Exams system.

Security plays a very vital in terms of the E-Exams GUI used by any of the candidates sitting for the Exams and each user have to be verified and to be authenticated as the right privilege person to login into the system. Policies procedure and technical dealings used to prevent unauthorized access, modification, stealing or physical harm to information system. Security can be supported by using an Array of methods and apparatus to preserve information. In higher education establishment, the security marks of student is the most insightful and preserving of information is a big issues to put into consideration and need to be addressed as well as unwitting exams paper. The institution can be affected by acknowledging the security of their systems has been violated resulting to unauthorized marks as been altered or leaking of the exams paper.

#### **1.4 Research Objectives**

The primary objectives of this study is to investigate and to know the methodology been used in the existing system and the level of security safeguard of the e-exams in Nigeria and to know one of the factors that impact the psychological distress and more security biometric user's authentication aspect of the student

credibility of the e-exams proposed system that should be included in the previous existing proposed system.

- i. To identify the existing student assessment methods of E-Exams system in Nigeria Universities in terms of additional security aspect of view.
- ii. To know the impact of Psychological distress aspect towards students E-Exams performance
- iii. To analyze the respondents view on the proposed E-Exams system in Nigeria University by considering additional security.

In regards on the earlier studies, that stressed out security biometric user's authentication aspect of the previous existing E-Exam system that is a demands regarding learning and academic credibility achievement. To identify more factors that impacting the student using the e-exams system in Nigeria universities. The namely factors are psychological distress among the university students.

### **1.5 Research Questions**

In array to execute this research, Can student credibility and system trusted enhanced secured model for E-Exams system in Nigeria University. This research will look into this research following research questions:

- i. Are the current students screened with additional authentication biometric technologies by FUT Minna University Nigeria in terms of face recognitions in e-exams system?
- ii. Does the current e-exam system supported by face capturing biometric technologies?
- iii. What is the trusted credibility of student results of the e-exams system?

### **1.6 Scope of Study**

This study spotlight on some namely factors are psychological distress among the university students, and more security biometric users authentication aspect of the



previous existing E-Exam system that is a demands regarding learning and academic achievement.

Only the Federal University of Technology Minna, Nigeria will be given the opportunity to complete the questionnaire, and only the top managers or policy maker within the e-exams domain will be allowed to complete and comment on the questionnaire.

A questionnaire will be used to collect information and gathering of the related data from internal and external parties. Information will be collected from the key people in the university who have policy making influence or managerial control and who have in-depth of the equipped examination process of the institution.

Electronic questionnaires will be dispersed and collected to exploit the handiness and speed up of e-mail credentials between parties. Thus, two (2) factors of face recognition biometric authentication namely (i) reliability (ii) security that will be used to enhanced current existing e-exam system in the proposed model.

## **1.7 Structure of the Study**

This notion is consist of five chapters. The first chapter commenced on the background of study, research problems, objectives, and the significance of the study, scope of the study and limitation of the study. Chapter two, literature review on related work, Chapter three will identify some of the risk factors and impact to the students that are surrounded by the e-exams sphere and method of the sturdy. Chapter four present the data analysis and alert on the originated equipped strategy based on the data from this studying tidy to support e-exams managers to manage the security requirements of the exams sphere at tertiary establishment. The primary aim of this chapter is not to criticize the exiting e-exams system being used in the university in Nigerian based on the impacts that is been faced by the students such as the psychological distress aspect view and more security biometric users authentication that was not included in the existing architecture model. The discussion of finding, conclusion and recommendation of the study is discussed in chapter five.

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