Using E-hand Writing Method in E-Assessment in E-Learning

Saad Mamoun Abdel Rahman, Mohammed Awad Mohammed
Computer Science Department AL-Imam Muhommed Ibn Saud Islamic University, AL-ahsa,
Kingdom of Saudi Arabia

Abstract— The importance of using of biometrics science technologies recently increased in our public life, in addition to security applications in documentation, identifying the characters and so on, it also entered into a hardware industry specially the electronic ones, the smart phone had become opens only through fingerprint, personal computers with the capability to identify the personality by reading faces. This research aimed to submit a proposal to use e-handwriting - which is considered one of the biometrics technologies- in the evaluation process of e-learning. The proposed idea depends on the student registration for the way of his hand writing using an electronic board, and then extract the features of the handwriting in addition to other electronic features like the time it takes to write and the angle of the pen pressure, etc., and stores it in the database. At the stage of assessing the student's s/he takes a distance exam and answers the questions editorially by writing on the same board. Thus, the proposal offers alternative solutions to the learner personality authentication problem, as well as a new way to the process of e-assessment.

Keywords— E-hand writing, handwriting, E-assessment, assessment, E-Learning.

I. INTRODUCTION

The technologies of biometrics science is identified as a method for determining the person or verifying the identity of a person based on physiological, biological and behavioural characteristics which include fingerprints and hand, face, voice and iris geometry and retinal features. Behavioural characteristics include personal signatures and the method used in the strikes of the keyboard. [1] The uses of these techniques has increased broadly, it entered in the electronics industry, which often has a personal property to its users, such as smart phones and laptop computers, etc., in addition to making doors and cabinets open only by vital fingerprint (fingerprint - face imprint ... etc.) for security and privacy purposes. The e-learning has abundant fortune of these technologies, especially that in many of its parts required to identify and verify personal character, like what in the e-assessment and e-attendance. Assessment in modern education means the process aimed to stand on the achievement of educational goals, and the effectiveness of the entire educational program of the planning and implementation of methods and teaching aids [2]. But the e-assessment is identified as: a process of using information networks, equipment and computer software and multiple sources educational material, using assessment tools for the collection and analysis of student responses, which helps the faculty member to discuss and determine the programs effects and activities of the educational process as to be able to reach a comprehensive judgment based on Quantitative and qualitative data related to the collection of study data [3].The goal of this research " conceptual proposed " is to find a new method for e-assessment process through e-learning system and process of personal authentication during the exams period or during the Synchronized electronic educational process - such as virtual classrooms- through using of e-handwriting, which is considered one of the behavioural technologies of biometrics science. If what has been the practical application of this proposal, it will certainly be a new addition and a real pillar of the e-assessment and thus increases the reliability rates of e-learning and reduces the disadvantages of distance education.

II. RESEARCH PROBLEM

Assessment is considered as a largest premonition for both teachers and students, it is the line that is weighing and measuring what has been achieved during the educational period, and whether the objectives have been achieved from the educational process, and to what extent reached? And e-learning - especially because it considered as upgraded version of distance education - inherited this premonition as well. This study proposed to find a solution to the authentication process from the student's identity, and thus raise the dependability and reliability of e-learning. And therefore we can sum up the problem of the research as follows:

1. Can educationalist use the technologies of behavioral biometrics science in e-learning?
2. Is it possible through the use of e-handwriting system to use the types of essay questions and open questions in the e-exams.

III. RESEARCH OBJECTIVES

The research objectives can be summarized as follows:

I. Exploring the effectiveness of using the technologies of behavioral biometrics science in e-assessment.
II. The use of the e-handwriting method to satisfy the need of the teaching staff in developing questions outside the framework of the objective questions(multiple choice, yes or no questions, matching questions... etc.), and opening the door to add short and long answer questions, essay questions and others.

IV. PREVIOUS STUDIES

There are many studies on the e-assessment process, summarized as follows:

The first study: Barry Hayes & John Ringwood: The researchers suggest a method for personal check (authentication) through telephone conversations in the oral exams, and therefore the use of voice recognition as a biotechnology, and thus supports the authentication of personal process and reduce the chances of identity theft during oral examinations and supports tests short e-exams [4].

The second study: Bruno Elias & Apaecido This study aimed to use the technology of face imprint as a biotechnology through capturing images with a Web camera within the e-learning environment and then verify the person's identity by capturing images and comparing them with the ones stored which taken at the registration stage, thereby raise the degree of interactivity and reliability during performing tests [5].

The third study: Yousef Sabbah and others: who suggested in their research to use monitoring camera "webcam" to authenticate the identity of the examinee and watch him during his performance of e-exam, without the need for an observer during the test, thus it support and strengthen the authentication of identity and ensure that no impersonation.[6]

The fourth study: Saad Mamoun and AbdelWahab they clarify the relationship between the biometrics and e-learning. And the different biometric technologies that are being used in e-learning [7].

V. METHODOLOGY

The research methodology and its procedures can be described by dividing it into two stages:

- The stage of registration.
- The stage of the e-assessment.

The stage of registration: namely, the student's registration within the student records, as student belongs to the educational institution, and then storing his/her initial data (name, address, date of birth, phone number, national number, university number…etc.) in the database, in addition to storage attributes and characteristics of his/her e-handwriting, using an electronic pen and electronic board, and then store them within the biometrics database. See Figure (1)

The stage of e-assessment: in which student do his/her e-exam by answering the questions that appear in front of him on the screen using the same tools that were used at the stage of registration (electronic pen and electronic board), and during that the software will perform a comparison to ascertain the identity of the examinee through writing features derived from the current hand-writing with features stored in the biometric database: is it true or not?
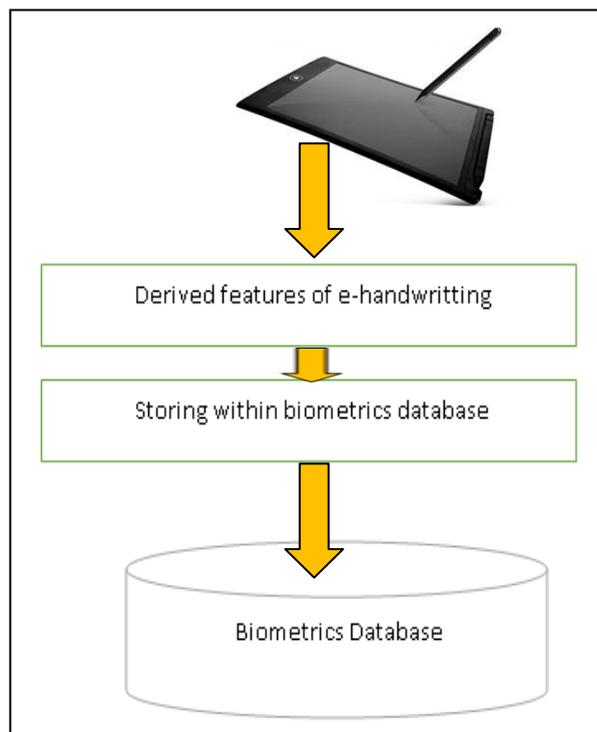

Fig. 1 The stage of registration and take the handwriting features after that save it in biometrics database.
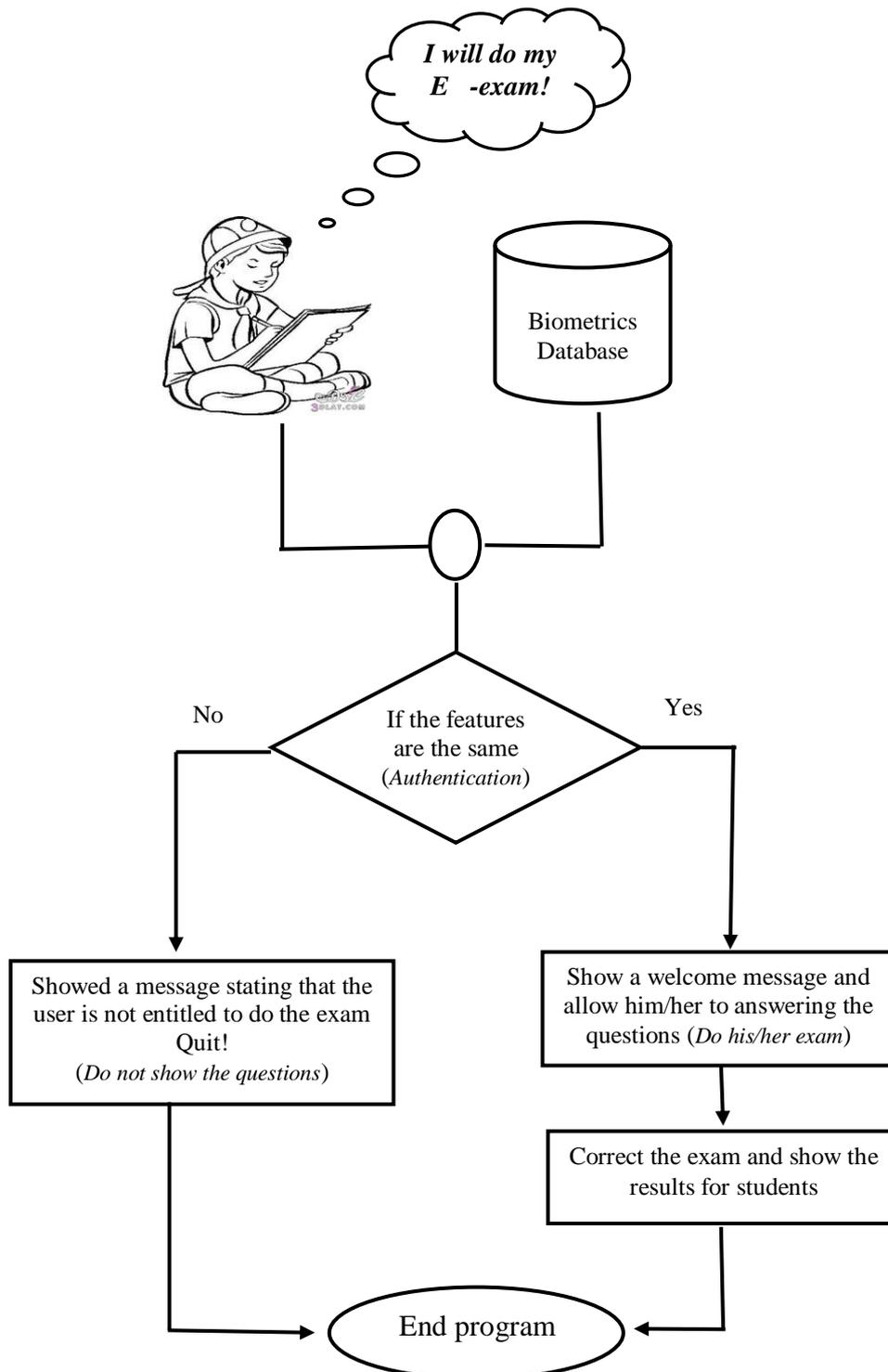
Fig. 2 The stage of the e-assessment

VI.   RESULTS & DISCUSSION

According to what has been mentioned in detail in the research methodology, the research presented initial proposal for how to take advantage of the handwriting features in the process of e-assessment, and the foregoing, the researcher found that the success of the operation heavily depend on the electronic pen and the electronic board so they must be chosen with precise specifications.

The majority of the means that were used in the research mentioned in the paragraph of the previous studies were performed using technologies of biological biometrics science, but the technology that has been used here is behavioral technology electronically supports the known way of written exams, because it allows -as previously stated- that it supports multiple types of editorial questions, if were not all of them.

Many time the traditional educational people who are afraid of E-Learning and against it, they are talking about the assessment in E-Learning, they are said it is too difficult and there is no authentication, because nobody certain that the student is examine at this time, this research increase the reliability for this type of assessment, and it is solution.

The time factor is very important in this proposal because it is using to verify of the student before and during the E-exam so the student have must to training his self in the handwriting and E-handwriting. In addition the E-tablet immediately start to detect and store the start time the student touch it.

VII. CONCLUSIONS

Assessment in E-Learning till now faces many challenges and difficulties. This research presented a solution in the electronic exam, which is an important part of e-learning. It works in two directions. The first is to verify the identity of the examiner and the second direction to confirm that the examiner is the one who do the E-exam. In addition this methods open the door for new type of questions (in E-exam) like long answer questions. So the research discuss about the benefits of this using and how to support the reliability of assessment in the E-Learning.

REFERENCES
[1]   John R.Vacca "Biometric Technologies And Verification Systems", Elsevier Academic Press, USA, 2007.
[2]   Eilam, salahi, 2003, alttaqwim alttarbiwi almuassi, dar alfikr alearabii, alqahirat, misr.
[3]   Algharib, zahar 'iismaeil, 2009, almuqarrarat alalkitruniat: tasmimuha - 'iintajiha - nasharaha - tatbiqiha - taqwimuha, ealam alkutubi, alqahirat, misr.
[4]   Barry Hayes John V. Ringwood, "Student Authentication for Oral Assessment in Distance Learning Programs", IEEE Transactions on Learning Technologies, vol.1, no. 3, pp. 165-175, July-September 2008, doi:10.1109/TLT.2009.2
[5]   Bruno Elias & Aparecido, "A Video-Based Biometrics Authentication for e-learning web Applications", 11th International Conference, ICEIS 2009, Milan, Italy, May 6-10, 2009. Proceedings.
[6]   Yousef Sabbah and other, "Synchronous Authentication with Bimodal Biometrics for e-Assessment: A Theoretical Mode", Proceedings of 6th International Conference SETIT 2012, Tunisia, Sousse, March 24, 2012.
[7]   Saad Mamoun & AbdelWahab Saber, Strategies and Contributions of Biometrics in E-Learning, International Journal of Computer and Information Technology (ISSN: 2279 – 0764) (IJCIT), Volume 6 - Issue 2 March 2017.