LGJDX ISSN No: 1008-0562 Journal Of Liaoning Technical University Natural Science Edition

# THE ROLE OF ARTIFICIAL INTELLIGENCE IN AUTOMATIC GRADING AND ASSESSMENT OF FINAL YEAR STUDENTS OF BAMIDELE OLUMILUA UNIVERSITY OF EDUCATION, SCIENCE AND TECHNOLOGY, IKERE – EKITI, EKITI STATE, NIGERIA

**Ayo-Ogunlusi Veronica Abiola**

Department of Business Administration, Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti, Nigeria

## Abstract

*Artificial intelligence (AI) is transforming various industries, and education is no exception. Rapid advancements in AI technology have become essential for educators and educational assessment professionals to enhance teaching and learning experiences. AI-powered educational assessment tools provide numerous benefits, including improving the accuracy and efficiency of assessments, generating personalized feedback for students, and enabling teachers to adapt their teaching strategies to meet the unique needs of each student. Therefore, AI has the potential to revolutionize the way education is delivered and assessed, ultimately leading to better educational outcomes for students. Automated grading is a system designed to help lecturers or institutions assess more effectively and quickly. It is an impartial assessment that makes the correction process fairer. Moreover, large population of students are difficult to assess and grade manually. However, this paper investigate the role of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. The descriptive survey design was used for the study. The population of the study was made up of 177 final year students of three departments in Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. The total enumeration technique was adopted due to the relatively small size of the population. The questionnaire was the instrument for data collection. The result shows that artificial intelligence significantly influence grading and assessment of final year students in Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria, especially among large population of students. Likewise, it is crucial to train lecturers in the use of this technology (Artificial Intelligence), but not only on the basis of learning the tools, but also based on pedagogical reference models that give meaning to the development of classes. If we want to promote technology enhanced learning and smart environments using AI, lecturers are an essential element of successful.*

**Keywords**: Artificial Intelligence, Automated Grading, Assessment

## Introduction

In the realm of higher education, the evaluation of assessment techniques, from traditional exams to dynamic digital platforms, significantly reflects shifts in educational philosophy and the increasing integration of digital technology. These changes are pivotal, as they enhance the efficiency of educators' pedagogical strategies and indirectly improve student learning experiences (Ewell & Cumming, 2017). Historically, traditional paper-based assessments such as multiple-choice questions, short answers, and essays required substantial time for creation, administration, and grading. These formats effectively tested students' abilities to apply learned concepts to new situations and synthesize ideas from various disciplines (Harris, 2017). Despite their effectiveness, these methods imposed a heavy administrative burden on educators, constraining their time for personalized instruction and engagement, crucial elements in nurturing students. The introduction of digital technologies in educational assessment and grading has transformed the landscape by offering a variety of interactive assessment methods like quizzes, online discussions, and multimedia projects. These tools not only provide immediate feedback but also significantly reduce the time educators spend on grading, thus freeing them to develop pedagogical approaches and foster a more engaging learning environment conducive to complex education (Harris, 2017). Moreover, the integration of digital assessment tools such as artificial intelligence into educational systems, especially within higher education, has underscored their potential to streamline the teaching process. By automating aspects of assessment and feedback, these tools can relieve the administrative load, enabling educators to focus more on personalised instruction and direct engagement with students. This shift towards enhanced digital technology in teaching processes underscores a broader change in educational values, emphasising the importance of inclusive, interactive, and student-centered learning experiences (Harris, 2017).

Automated grading is a system designed to help lecturers or institutions assess more effectively and quickly. Automated sorting with paper sorting is the new solution to simplify the sorting process for numerous tasks. This process is a method of assigning a grade to an assignment submitted by a student. In addition, it helps all types of students to understand the quality of the work presented. Automated grading is an impartial assessment that makes the correction process fairer. Besides that, by using various concepts from established learning theories, the goal and

this process is to improve the quantity, quality, and speed of feedback. The implementation of automated grading has undergone many significant steps throughout its development. Although the idea started out simple and basic, today's version of auto grading is quicker and more efficient than ever, and is becoming increasingly popular in educational software.

The first methods of automated classification were dated in 1970. However, until 1990, there were not many advances, as only in recent years have improvements been made in the technology that allows the evaluation of language, grammar, plagiarism, and other important aspects. In 1999, the Educational Testing Service used automatic classification for the first time for the GMAT (Graduate Management Admission Test). Over the years, the methods of auto grading have evolved and, as a result, the automated classification methods have done the same. With such sophisticated resources, more efficient evaluation methods were created, and through using AI it is now possible to develop better ways to identify patterns making these auto grading and assessment more effective. Automated grading has become more relevant than ever. Most schools have moved to online learning and teaching at a distance, causing them to turn to software to help make the process easier. Many of these programs feature methods of automated grading, as it provides numerous benefits to users, whether they are students or administrators.

Traditionally, essays are assessed based on content and structure, often using an assessment rubric to achieve objectivity (Malouff & Thorsteinsson, 2016). However, when multiple educators are involved in grading, ensuring fair and consistent assessment becomes challenging due to individual differences in grading approaches (Bergqvist, 2015). Despite shared assessment criteria, considerable variation in grading can persist, which may lead to perceived unfairness (Bouwer, Koster, & van den Bergh, 2023). Achieving reliability in educational assessment is crucial for ensuring fairness in assessment. Reliability focuses on whether different educators, when assessing the same student work, arrive at similar conclusions. Even when a single educator is grading many students, consistency can be compromised over time, leading to variations in assessments from the first to the last student. While using clear, explicit assessment criteria and rubrics has been shown to help reduce variability in these judgements, achieving a completely fair assessment remains difficult, particularly when several educators are involved. Although this approach improves assessment quality by focusing on specific, relevant evidence

rather than personal opinions, the complexity of human judgement can still introduce inconsistencies (Van der Schaaf, Baartman, & Prins, 2012).

The challenge of ensuring fair and consistent assessment intensifies in large classes such as final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. Moreover, in these courses, it is common for students to respond to exam questions with short essay answers. Assessing a high volume of short essay answers is time-consuming and complicates the maintenance of consistency and fairness. Research has shown that "noise", unrelated influences such as mood, hunger, or weather, can significantly impact grading decisions, introducing unpredictability and variability in assessment quality (Kahneman, Rosenfield, Gandhi, & Blaser, 2016). Further studies highlight that these inconsistencies include not only external influences but also inherent inconsistencies in how information is processed by different assessors, even under identical conditions (Kahneman, Sibony, & Sunstein, 2021). Feedback is another crucial component in the educational setting, strongly influencing student learning (Panadero, 2023). However, providing meaningful and timely feedback becomes challenging in large classes due to time constraints (Nieminen & Carless, 2023).

Addressing these challenges, rapid advancements in machine learning offer promising solutions. Machine learning, a core subset of artificial intelligence (AI), is believed to be able to provide more consistent and objective assessments, handle large volumes of work efficiently, and offer personalised feedback by identifying students' strengths and weaknesses (Beseiso, Alzubi, & Rashaideh, 2021; Conijn, Kahr, & Snijders, 2023; Hussein, Hassan, & Nassef, 2019; Zhai, Yin, Pellegrino, Haudek, & Shi, 2020). However, a significant gap remains in directly comparing the quality of educator assessments with AI assessments, highlighting an area for future research to ensure fair and consistent assessment methods. As AI technologies rapidly evolve, it is vital to approach their integration with optimism balanced by caution. The spectrum of opinions ranges from enthusiastic endorsement of AI's potential to transform education to skepticism about the speed of its development and implications. This diversity calls for a thorough evaluation of AI technologies, weighing their benefits against ethical considerations and potential risks. By engaging critically with AI, we can ensure that it serves as a supportive tool in education, enhancing learning experiences without compromising the values that define quality. Hence, this

study investigate the role of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria.

**Objective of the Study**

The objective of the study was to determine the influence of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria.

**Research Question**

In order to achieve the objective of the study the following research question guided the study.

- What is the level of the influence of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria?

**Scope of the Study**

The study focused on the influence of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. The respondents are final year students of the above academic institutions from three departments which include Accounting, Business Administration and Office and Information Management.

**Review of Related Literatures**

**Artificial Intelligence Applications on Grading/Assessment**

Assessment of a student means collecting, analyzing information, interpreting, and acting on that information about his/her performance with respect to learning goals (Harris, 2017). There are many types of assessments. However, the choice of assessment depends upon the purpose and choice of the person making the assessment. For example, educational institutes mainly use standard-based assessments which is beneficial for grading, etc. Another type of assessment is learner-centered measurement models which are most formative and is beneficial for the guidance of instruction and for the supporting learning of students. It may or may not always be valid or useful. Unlike the traditional or old methods of assessments, currently, computer-based

applications are also in use for the purpose of assessments. Those AI applications not only give a rapid assessment of large numbers of students but also same the same standards without any biases, etc., and all students get the grading without the fear of bias from any likes or dislikes. Additionally, it also assists the teachers, minimizes their workload, and provides time for other tasks

On one hand, the assessment of a large number of students is not an easy task, on the other hand, it is one of the primary tasks of teachers (Grivokostopoulou, 2021). After the attack of COVID-19, educational institutes have shifted their operation to online learning systems and systems like Learning Management Systems, MOOC, MOODLES, etc., and it is very difficult for teachers to handle everything online, especially the assessment of assignments, quizzes, and answer papers. Automatic assessment or grading systems are one of the answers to address the issue. Questions of various types like short answer questions, multiple-choice questions, etc., can be assessed through automatic assessment systems **(**Nieminen & Carless, 2023**)**. Many researchers have worked for the development of impartial and effective grading or assessment systems using different types of computer technology (Panadero, 2023). AI applications through machine learning methods and unsupervised clustering algorithms can work effectively and can address the challenge.

Mirchi et al. (2021) used AI for simulation-based training in medicine, and they created a Virtual Operative Assistant to give automatic feedback to students based on metrics of performance. From a formative educational paradigm, they integrate virtual reality and AI to classify students in relation to proficiency performance benchmarks and the system gives feedback to help them improve. In the same field of medicine, we can find the results of Janpla and Piriyasurawong (2020). They analyze the use of AI to produce tests in e-learning environments and they develop an intelligent software to select questions for online exams. In a different work, Saplacan et al. (2020) suggest that feedback provided by digital systems in learning situations have some problems such as eliciting negative emotions (these are neglect, frustration, uncertainty, need for confirmation and discomfort) experienced by students in higher education. Their research used a qualitative design based on a story dialogue method and its final conclusion is that “digital interfaces should also arouse positive emotions through their design”.

The research of Samarakou et al. (2021) is focused on continuous monitoring and assessment (Student Diagnosis, Assistance, Evaluation System based on Artificial Intelligence, StuDiAsE) of engineering students and AI proves its usefulness to provide personalized feedback and evaluate performance with quantitative and qualitative information. Finally, the study of Rodríguez-Ascaso et al. (2023) is focused on adaptive learning systems and self-assessment: "In the next future, we can expect that, within adaptive e-learning systems, both automatic and manual procedures will interoperate to elicit users' interaction needs for ensuring accessibility". They combine a personalized system with self-assessment and the use of learning objects for people with disabilities: "students with visual, auditory, and mobility impairments, as well as non-disabled students" and "results indicate that the procedure allows students, both disabled and non-disabled, to self-assess and report adequately their preferences to access electronic learning materials". They found, however, some interaction problems in a number of students with visual impairments.

The work presented by Rhienmora et al. (2021) is based on the assessment of competence in performing different dental techniques. The system used combines VR with AI. Based on the movements made by the user, the system evaluates his or her competence and determines a score, which leads to their categorization as either novice or expert. The study by Ouguengay et al. (2021) assesses reading and writing skills in Amazigh by means of test assessment. The system establishes a score based on the answers given to the items. Kaila et al. (2022), based on active learning methods, set up different types of collaboration based activities that are automatically assessed. Goel and Joyner (2021) in their AI-based course for teaching AI set up a system for students to automatically receive graders that allow them to quickly visualize their results and also provide feedback. Grivokostopoulou et al. (2021) use AI to evaluate students' performance in programing and automatically give them a grade on the task performed. Liu et al. (2020) show how their employed AI system is able to automatically evaluate students' engineering essays in English. Jani et al. (2020) use Machine Learning to evaluate OSCE (Observed Structured Clinical Exams) transcripts and automatically establish a score. The study by Maicher et al. (2021) goes along the same lines by automatically assessing and grading medical students' collection of patient information. Ulum (2021) describes the Turkish State University's application for assessing students' English language proficiency. This AI-based application establishes a grade automatically. Finally, Choi and McClenen (2021) describe their

AI system for formative assessment, which performs an automatic grading of learners to give feedback and to adapt the following tasks accordingly

**Methodology**

This study adopted a descriptive research survey design of correlational type to determine the influence of artificial intelligence on automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. The population of the study comprised 177 final year students of the targeted institution which include 110 final year accounting students, 64 business administration students and 3 office and information management students. Total enumeration of the entire 177 students was undertaken due to the manageable size of the population. Questionnaire was the instrument used for data collection. The instrument was considered appropriate because of the large number of the respondents involved.

**Results and Discussion**

The questionnaire return rate is presented on Table 1

**Table 1: Questionnaire Response**

| S/N | Departments | No of Students | % |
|---|---|---|---|
| 1 | Accounting | 110 | 62.1 |
| 2 | Business Administration | 64 | 36.2 |
| 3 | Office and Information Management | 3 | 1.7 |
| | **Total** | **177** | **100** |

**Research question: What is the level of the influence of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria?**

**Table 2: Descriptive Responses on the level of the influence of artificial intelligence in automated grading and assessment of final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria.**

| Statement | SA | A | D | SD | Mean |
|---|---|---|---|---|---|
| Improvement in accuracy of students' grading | 71 (40.1%) | 54 (30.4% ) | 35 (19.5% ) | 18 (10%) | 3.54 |
| AI is capable of assessing students' learning outcome | 87 (48.9%) | 72 (40.4%) | 19 (10.7%) | - (0%) | 3.54 |
| AI reduces the bias in grading and assessment | 90 (50.9%) | 84 (47.7% ) | - (0%) | 2 (1.4%) | 3.62 |
| AI has d potential in replacing human teacher in academic grading and assessment | 83 (47.0%) | 87 (49.3%) | 4 (2.3%) | 2 (1.4%) | 3.57 |
| AI can exacerbate the existing inequalities in education | 90 (51.0%) | 71 (40.2%) | 5 (3%) | 10 (5.8%) | 3.60 |
| AI do enhance students' | 89 | 69 | 2 | 16 | 3.51 |

| | | | | | |
|---|---|---|---|---|---|
| learning outcome | (50.2%) | (39.1%) | (1.4%) | (9.3%) | |
| AI grading system accurately reflects students' learning | 72 (40.6% ) | 84 (47.4%) | 9 (5.2%) | 12 (6.8%) | 3.60 |
| Automated grading motivate students in learning | 106 (60%) | 66 (37.4) | 5 (2.6%) | - (0%) | 3.43 |
| Technology should be used to support academic grading and assessment | 94 (53.1% ) | 79 (44.4% ) | 2 (1.1%) | 2 (1.4%) | 3.48 |
| **Weighted Mean** | | | | | **3.65** |

The finding of the study revealed that artificial intelligence influence grading and assessment of final year students in Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria. This finding is in support of the submission carried out by Mirchi et al. (2021) used AI for simulation-based training in medicine, and they created a Virtual Operative Assistant to give automatic feedback to students based on metrics of performance. From a formative educational paradigm, they integrate virtual reality and AI to classify students in relation to proficiency performance benchmarks and the system gives feedback to help them improve. In the same field of medicine, we can find the results of Janpla and Piriyasurawong (2020). They analyze the use of AI to produce tests in e-learning environments and they develop an intelligent software to select questions for online exams. In a different work, Saplacan et al. (2020) suggest that feedback provided by digital systems in learning situations have some problems such as eliciting negative emotions (these are neglect, frustration, uncertainty, need for confirmation and discomfort) experienced by students in higher education. Their research used a qualitative design based on a story dialogue method and its final conclusion is that "digital interfaces should also arouse positive emotions through their design".

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AI system for formative assessment, which performs an automatic grading of learners to give feedback and to adapt the following tasks accordingly.

**Conclusion and Recommendations**

AI is today one of the main technologies being applied in all fields and at all levels. However, in education its use is not widespread, probably due to a lack of knowledge on the part of users, but it is set out to become one of the main tools to be used. As already mentioned, the main uses of AI applied to education are related to grading and assessment, although we also find other examples of use such as personalization or quality assessment. In this systematic review we have focused on analyzing the use of AI applied to student assessment based on the analysis of reports gotten from final year students of Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria.

Finally, it is worth noting as a conclusion of this research that the use of AI in one group with another that does not use it, the former obtains better results. In the same way, Grivokostopoulou et al. (2021) show how AI system is suitable for student evaluation and grading. Despite all these advances, and what AI can do in the field of education, this technology needs to be humanized. Research so far shows that artificial intelligence influences grading and assessment of final year students in Bamidele Olumilua University of Education, Science and Technology, Ikere – Ekiti, Ekiti State, Nigeria, especially among large population of students. Likewise, it is crucial to train lecturers in the use of this technology (Artificial Intelligence), but not only on the basis of learning the tools, but also based on pedagogical reference models that give meaning to the development of classes. If we want to promote technology enhanced learning and smart environments using AI, lecturers are an essential element of successful.

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