

# Extent of Integration of Artificial Intelligence Tools for Assessing Students' Academic Achievement in Automobile Technology Education in Colleges of Education in South East, Nigeria

WOGU, S. N PHD<sup>1</sup>, NWAORGU, O.<sup>2</sup>, NWANKWO, C. O.<sup>3</sup>, IGWE, N. PHD<sup>4</sup>

<sup>1,3,4</sup>Department of Technical Education, School of Vocational and Technical Education, Abia State College of Education (Technical), Arochukwu

<sup>2</sup>Department of Business Education, School of Vocational and Technical Education, Abia State College of Education (Technical), Arochukwu

**Abstract-** *The main purpose of this study was to ascertain the extent of integration of artificial intelligence tools for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. Three research questions and three null hypotheses guided the study. Descriptive survey research design was adopted. The entire population of 68 automobile technology educators in the eight public colleges of education in South East, Nigeria were studied without sampling. The instrument for data collection was validated by three experts and the reliability was established using Cronbach alpha statistic which yielded a coefficient of 0.77. Mean and standard deviation were used to answer the research questions while t-test was used to test the null hypotheses at 0.05 level of significance. Findings of the study revealed that automated grading tools, online polling tools and learning management systems are integrated to a low extent in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The study concluded that automobile technology educators are struggling to integrate automated grading tools, online polling tools and learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. Among others, it was recommended that automobile technology educators need to undertake in-service on artificial intelligence technologies to enable them use automated grading tools, online polling tools and learning management systems for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria.*

**Keywords:** *Colleges of Education, Artificial Intelligence, Students' Academic Achievement*

## I. INTRODUCTION

In a bid to facilitate the professionalization of the Nigerian teachers and prepare them for the global practices in the teaching and learning environment, public and private colleges of education were founded and promoted in rural and urban areas in Nigeria. Onokpaunu (2023) colleges of education are teacher training institutions that provide full-time and remedial courses in instructional methodologies, learning styles, school management, behavioural and sociological dispositions of children, adolescents and adults, philosophical and theoretical underpinning of subject matters as well as curriculum development of programmes across all areas of learning. The colleges of education provides Technical Vocational Education and Training (TVET) programmes culminating in the award of the Nigeria Certificate in Education (NCE), which is the minimum qualification for teaching basic education in areas such as Agricultural Education, Business Education, Home Economics Education, Automobile Technology Education, Building Technology Education, Metalwork Technology Education and Woodwork Technology Education (Owo & Deebom, 2020).

In response to the development of smart automotive technologies and digitally connected transport infrastructure in the automotive industry, automobile technology education was inculcated in the Nigerian colleges of education to produce automotive professionals and entrepreneurs in automobile industries. Wogu, Okoye, Nwankwo and Nwaorgu (2024) posited that automobile technology education is a specialized vocational and technical education programme that covers the design, construction,

maintenance and repairs of automobiles with engines. Furthermore, Otuo, Ikpe and George (2025) submitted that the curriculum of automobile technology education at the colleges of education is designed to train students in automobile technology skills to secure employment or become employers of labour and to equally acquire the necessary pedagogical knowledge for teaching automobile courses in secondary schools and technical colleges.

In a nutshell, automobile technology education is a theoretical and practical body of knowledge that is instructionally positioned to expose students to the numerous opportunities in the local and international automotive markets. One quick avenue of evaluating the viability of automobile technology education in colleges of education is through students' academic achievement. Academic achievement indicates the extent to which students have accomplished the specific instructional objectives of a subject matter in schools. Khan, Begum and Imad (2019) postulated that grade point average, semester grade point average and cumulative grade point average (CGPA) are used to quantify the academic achievement of students. Generally, academic achievement can be both indicative and predictive (Nwaukwa, 2021). Ekhasemomhe in Nwaukwa (2021) quipped that it is indicative when it pin-points a students' level of success, that is, when a student who made grade A in a subject is adjudged to have had a higher achievement than another student who made grade C in the same subject. The author posited it is predictive when it is a criterion for determining the ability of a student to undertake similar task such as the case of a student who is deemed fit to study automobile technology education in tertiary institutions because of his or her high score in automobile trade examination in technical colleges.

Academic achievement, in this study, is defined as the rate of students' academic success in automobile technology education in colleges of education. Assessment of student's academic achievement is a key aspect of education, as it helps to identify their strengths and weaknesses on subject matters. Assessment, according to Baranovskaya and Shaforostova (2017), give students the opportunity to show what they have learned rather than catching them out or to show what they have not learned. Assessment activities, according to Shabbir, Zafar, Rafiq and Bhuttah (2021) include questions by educators during or after instructional process.

Students can be assessed through checklist or observation. But the most important and commonly used way of assessment is the traditional written form of assessment that consists of assignments, question answers test or papers, quiz, worksheets or different kinds of projects (Orhani, Saramati, Krasniqi & Morina 2024). Successful assessment activities enable students to receive qualitative instructional experience and also assist educators to support students' academic progress in the cognitive, affective and psychomotor domains of instruction in automobile technology education in colleges of education.

Assessment of student's academic achievement in automobile technology education in colleges of education has evolved significantly over the past decades, moving from traditional classroom assessments to more modern and comprehensive methods. One of the main challenges of assessing students' academic achievement with the traditional classroom assessment is that it can demand a significant investment of time and energy from teachers (Chen, Wang & Zhang, 2020). However, the process has become more effective, individualized and data-driven with the inclusion of artificial intelligence tools, allowing educators to make well informed judgments regarding learning outcomes and students' progress (Cope, Kalantzis & Sears, 2021). Artificial Intelligence (AI) refers to the field of computer science that involves creating computer programs capable of imitating intelligent behavior and ideally enhancing human-like abilities (Kumar, 2019). With the increasing availability of big data and algorithms in the digital space, AI has the potential to revolutionize the way educators can assess student's academic achievement in automobile technology education in colleges of education.

Artificial Intelligence powered assessment tools can provide educators with valuable insights into student learning outcomes and instructional effectiveness in automobile technology education in colleges of education. AI can help automate many aspects of the assessment process, saving time and reducing the burden on teachers. AI assessment tools can analyze student's essays and provide feedback on grammar, structure, and content, reducing teachers' time grading assignments (Huang, Zou, Cheng, Chen & Xie, 2023). Although, there are numerous AI assessment tools, the researchers focused on automated grading tools, online polling tools and

learning management systems. Automated grading tools are used to scan answers, analyze students' achievement patterns and generate academic scores in seconds. Owan, Abang, Idika, Etta and Bassey (2023) averred that automated grading tools can help automate the grading process, saving time for teachers and providing students with immediate feedback on their assignments. By using automated grading tools, educators can focus more on essential tasks such as lesson planning and supporting students, resulting in significant time savings (Adiguzel Kaya & Cansu, 2023). Examples of automated grading tools include Gradescope, Zipgrade, Coursebox, SpeedExam, EssayGrader, Crowdmark, Turnitin AI, Akindi and Gradesnap among others.

Online polling tools are used by educators for gathering feedback and multiple opinions in the course of assessing students. Owan, Abang, Idika, Etta and Bassey (2023) posited that online polling tools is artificial technology that engages students to ask questions in real time about lessons taken in order to collect data from their response or check the level of students' knowledge regarding a course or topic. Examples of online polling tools include Kahoot, Mentimeter, Aha Slides, SurveyMonkey, Typeform, Slido, Google Forms, MicroPoll, Jotform and Poll Everywhere. In addition, Learning Management Systems (LMS) are platforms that allow educators to create, deliver, and manage learning materials, assignments, assessments, and evaluations for students. Learning management systems are e-learning platforms that provide students with the ability to use interactive features such as threaded discussions, video conferencing and discussion forums to automate defined instructional objectives and learning outcomes (Fındık-Coşkunçay, Alkiş & Özkan-Yıldırım, 2018). Examples of learning management systems include Blackboard, Schoology, Canvas, Edmodo, Chamilo and Moodle among others

Therefore, educators can use A.I assessment tools such as automated grading tools, online polling tools and learning management systems to administer online assessments, monitor student progress, and provide feedback on student academic achievement in automobile technology education in colleges of education. The clarion call for the integration of A.I assessment tools is anchor on the basis that they offer greater flexibility and accessibility, allowing for real-

time data collection and personalization of assessments. In agreement, Baker and Smith (2020) submitted that A.I assessment tools can significantly improve the accuracy and effectiveness of assessments by providing opportunities for immediate feedback and instruction tailored to individual student needs. Although, education institutions are using AI tools more and more to improve administrative, instructional and learning processes (Schmidt & Glassner, 2020), there seems to paucity of empirical works on the extent of integration of AI-powered assessment tools on students' academic achievement in automobile technology education, particularly in colleges of education in South East, Nigeria.

However, the extent of integration of artificial intelligence tools for assessing students' academic achievement in automobile technology education could be influence by gender of automobile technology educators' in colleges of education. Gender in this study refers to male and female automobile technology educators in colleges of education. Gender roles of automobile technology educators may influence their integration of artificial intelligence tools for assessing students' academic achievement in colleges of education in South East, Nigeria. But, this assumption needs to be supported by empirical evidence. Against this background, the researchers explored the extent of integration of artificial intelligence tools for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria

## II. STATEMENT OF THE PROBLEM

The subjective bias and tiredness of automobile technology educators' may present some sort of prejudice that will influence the assessment of their students in colleges of education. By automating the assessment activities and giving educators and students real-time feedback about their academic achievement, artificial intelligence tools can tools offer personalized learning experiences, provide instant feedback and assist educators in enhancing overall educational efficiency and effectiveness. However, the problem of the study is that the traditional assessment techniques are quite time-consuming and may not take into account the diversity of students that may affect their academic achievement in automobile technology education in

colleges of education. As AI technology continues to evolve, it is crucial to ascertain the current extent of integration of artificial intelligence tools for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. From literature gathered, there seems to be no holistic empirical study on the extent of integration of automated grading tools, online polling tools and learning management systems on students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. This is the gap the present study sought to fill.

#### Purpose of the Study

Specifically, this study determined the extent to which automated grading tools, online polling tools and learning management systems are integrated in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria.

#### Research Questions

1. What is the extent of integration of automated grading tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?
2. What is the extent of integration of online polling tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?
3. What is the extent of integration of learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?

#### Hypotheses

The following null hypotheses were tested at 0.05 level of significance

1. Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of integration of automated grading tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria
2. Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of

integration of online polling tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria

3. Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of integration of learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria.

### III. METHODOLOGY

The study adopted descriptive survey research design. Descriptive survey research design makes it possible for the researchers to gather empirical information from automobile technology educators on their current extent of integration of artificial intelligence tools for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The population of the study comprised 27 automobile technology educators in three Federal colleges of education and 41 automobile technology educators in five State colleges of education in South East, Nigeria. The entire population was studied without sampling because the size was not too large. Therefore, it was a census survey. A structured questionnaire developed by the researcher titled 'Integration of Artificial Intelligence Tools for Assessing Students' Academic Achievement (IATT-ASAA)' consisting of 20 items, structured on a five-point rating scale of Very High Extent, High Extent, Moderate Extent, Low Extent and Very Low Extent was used for data collection. To ascertain the face validity of the questionnaire, it was validated by three experts, two senior Automobile Technology Education lecturers and one Educational Technology lecturer all in the University of Nigeria, Nsukka. To determine the internal consistency of the questionnaire, a one-shot pilot test was conducted at the Federal College of Education (Technical), Omoku on 10 Automobile Technology Education lecturers who were not part of the research population. Data collected were analyzed using Cronbach's alpha statistic to determine the internal consistency of the instrument and co-efficients of 0.71, 0.79 and 0.82 for clusters B1, B2 and B3 respectively were obtained. This is high enough for the instrument to be considered reliable as suggested

by Nworgu (2015) that a reliability co-efficient of 0.70 and above is an acceptable reliability value.

Copies of the questionnaire were administered to the respondents in their offices personally by the researchers with four research assistants. Out of the 68 copies of the questionnaire administered, only 61 copies (representing 90%) were successfully retrieved and used for data analysis. Mean and standard deviation were used to answer the research questions and determine the homogeneity or otherwise of the respondents' views. T-test was used to test the null hypothesis at 0.05 level of

significance. A hypothesis was accepted where the p-value is greater than the alpha level of 0.05 ( $p > 0.05$ ), at an appropriate degree of freedom; otherwise, the null hypothesis was rejected. Data collected was analysed using SPSS version 23.0.

#### IV. RESULTS

##### Research Question 1

What is the extent of integration of automated grading tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?

Table 1

Respondents' mean ratings on extent of integration of automated grading tools in assessing students' academic achievement in automobile technology education

S/N	To what extent do you integrate the following?	$\bar{X}$	SD	Remarks
1	Gradescope	1.73	.77	Low Extent
2	Zipgrade	1.89	.53	Low Extent
3	Coursebox	2.02	.80	Low Extent
4	SpeedExam	1.96	.56	Low Extent
5	EssayGrader	2.25	.71	Low Extent
6	Crowdmark	2.40	.90	Low Extent
7	Akindi	1.97	.58	Low Extent
	Cluster Mean	2.03		

Data in Table 1 show that the automated grading tools listed have mean scores ranging from 1.73 to 2.40 are integrated to a low extent in assessing students' academic achievement. However, the cluster mean of 2.03 indicates that automated grading tools are integrated to a low extent in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The standard deviations for all the items are within the same range showing that the respondents are not wide apart in their mean ratings

##### Hypothesis 1

Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of integration of automated grading tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria

Table 2

Summary of t-test analysis of respondents' mean ratings on extent of integration of automated grading tools in assessing students' academic achievement based on gender

Gender	N	$\bar{x}$	SD	df	t-value	p-value	Decision
Male	41	69.37	7.84	59	.146	.139	Not Significant
Female	20	58.29	6.22				

Result in Table 2 shows that the p-value is 0.139, which is greater than the significance level of 0.05 ( $p > 0.05$ ). This indicates that there is no significant difference in the mean ratings of male and female automobile technology educators on the extent of integration of automated grading tools in

assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The null hypothesis of no significant difference between the two groups is, therefore, not rejected.

Research Question 2

What is the extent of integration of online polling tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?

Table 3

Respondents' mean ratings on extent of integration of online polling tools in assessing students' academic achievement in automobile technology education

S/N	To what extent do you integrate the following?	$\bar{X}$	SD	Remarks
8	Kahoot	2.09	.63	Low Extent
9	Mentimeter	2.11	.49	Low Extent
10	SurveyMonkey	1.99	.51	Low Extent
11	Google Forms	1.86	.45	Low Extent
12	MicroPoll	2.36	.79	Low Extent
	Cluster Mean	2.08		

Data in Table 3 show that the online polling tools listed have mean scores ranging from 1.86 to 2.36 are integrated to a low extent in assessing students' academic achievement. However, the cluster mean of 2.08 indicates that online polling tools are integrated to a low extent in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The standard deviations for all the items are within the

same range showing that the respondents are not wide apart in their mean ratings

Hypothesis 2

Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of integration of online polling tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria

Table 4

Summary of t-test analysis of respondents' mean ratings on extent of integration of online polling tools in assessing students' academic achievement based on gender

Gender	N	$\bar{X}$	SD	df	t-value	p-value	Decision
Male	41	60.11	6.95	59	.185	.206	Not Significant
Female	20	51.03	5.81+4				

Result in Table 4 shows that the p-value is 0.206, which is greater than the significance level of 0.05 (p-value > 0.05). This indicates that there is no significant difference in the mean ratings of male and female automobile technology educators on the extent of integration of online polling tools in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The null hypothesis

of no significant difference between the two groups is, therefore, not rejected.

Research Question 3

What is the extent of integration of learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria?

Table 5

Respondents' mean ratings on extent of integration of learning management systems in assessing students' academic achievement in automobile technology education

S/N	To what extent do you integrate the following?	$\bar{X}$	SD	Remarks
13	Moodle learning management system	2.17	.56	Low Extent
14	Sakai learning management system	1.81	.73	Low Extent
15	ATutor learning management system	1.99	.49	Low Extent
16	Canvas learning management system	2.35	.61	Low Extent
17	Chamilo learning management system	2.01	.52	Low Extent

18	Blackboard learning management system	2.37	.80	Low Extent
19	Edmodo learning management system	2.23	.44	Low Extent
20	Schoology learning management system	1.91	.86	Low Extent
	Cluster Mean	2.14		

Data in Table 5 show that the learning management systems listed have mean scores ranging from 1.86 to 2.36 are integrated to a low extent in assessing students' academic achievement. However, the cluster mean of 2.11 indicates that learning management systems are integrated to a low extent in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The standard deviations for all the items are within the same range

showing that the respondents are not wide apart in their mean ratings

### Hypothesis 3

Male and female automobile technology educators in colleges of education do not differ significantly in the mean ratings on the extent of integration of learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria.

Table 6

Summary of t-test analysis of respondents' mean ratings on extent of integration of learning management systems in assessing students' academic achievement based on gender

Gender	N	$\bar{x}$	SD	df	t-value	p-value	Decision
Male	41	55.80	5.24	59	.216	.173	Not Significant
Female	20	47.64	4.82				

Result in Table 6 shows that the p-value is 0.173, which is greater than the significance level of 0.05 (p-value > 0.05). This indicates that there is no significant difference in the mean ratings of male and female automobile technology educators on the extent of integration of learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The null hypothesis of no significant difference between the two groups is, therefore, not rejected

## V. DISCUSSION OF FINDINGS

Result of the study disclosed that automated grading tools, online polling tools and learning management systems are integrated to a low extent in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. The poor extent of integration of automated grading tools, online polling tools and learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria could be attributed to their inexperience of automobile technology educators with AI tools for instructional assessment. The finding of this study agrees with Chigozie-Okwum, Ezeanyej and Odii (2018) and Ngugi and Mwangi (2024) who reported

a low application of automated grading tools, online polling tools and learning management systems for instructional purposes in tertiary institutions. This means that automobile technology educators in colleges of education in South East are still using the traditional tools of assessing their students' academic achievement in automobile technology education

In addition, the study revealed that there is no significant difference in the mean ratings of male and female automobile technology educators on the extent of integration of automated grading tools, online polling tools and learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. This finding means that automobile technology educators, irrespective of their gender shared the same position regarding the low extent of integration of automated grading tools, online polling tools and learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria. This finding supports, Alumona and Akinseinde (2023) and Ventura and Lopez (2024) who reported that gender of educators did not significantly influence their opinions on the low extent of integration of automated grading tools, online polling tools and learning management systems for assessment of



students performance in tertiary institutions. It is therefore not out of place to assert that male and female automobile technology educators are yet to acquired AI skills to utilize automated grading tools, online polling tools and learning management systems for instructional engagements in colleges of education in South East, Nigeria.

## VI. CONCLUSION

The study concluded that automobile technology educators are struggling to integrate automated grading tools, online polling tools and learning management systems in assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria

## VII. RECOMMENDATIONS

Based on the findings and conclusion of this study, the following recommendations are made:

1. Automobile technology educators need to undertake in-service on artificial intelligence technologies to enable them use automated grading tools, online polling tools and learning management systems for assessing students' academic achievement in automobile technology education in colleges of education in South East, Nigeria.
2. Robust server infrastructure, reliable network components, accessible computing devices, and stringent security measures that are essential for successful implementation AI-powered assessment tools should be made available in automobile technology education programmes of colleges of education in South East, Nigeria.

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