INFLUENCE OF GENERATIVE ARTIFICIAL INTELLIGENCE ON BUSINESS EDUCATION STUDENTS' ACADEMIC PERFORMANCE, IN UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

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DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION, FACULTY OF EDUCATION, UNIVERSITY OF BENIN IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF EDUCATION (B.SC ED) DEGREE IN BUSINESS EDUCATION (ACCOUNTING OPTION)

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CERTIFICATION

We, the undersigned, hereby certify that this project work was carried out by **Wisdom Onyebuchi KENNETH**with a Matriculation Number **EDU1904737,** in the Department of Vocational and Technical Education, Faculty of Education, University of Benin, Benin City in partial fulfilment of the requirements for the award of Bachelor of Education (B.Sc. Ed.) in Business Education (Accounting Option).

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DEDICATION

This project work is dedicated to God Almighty.

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ABSTRACT

The Purpose of this study was to assess the influence of generative artificial intelligence on business education students' academic performance, in university of benin, benin city, Edo state. The total population for this study is one hundred and twenty (120) Business Education students from 100 level to 400 level of the 2022/2023 set, from the department of vocational and Technical Education, Faculty of Education, University of Benin, Benin City and a sample size of One hundred and sixteen (116) was used, using the proportionate stratified random sampling techniques. Five research questions were raised to guide the study, with a 0.05 significant level.

A descriptive survey design was adopted. A questionnaire containing thirty-three (33) items was the instrument used in obtaining responses from the respondents. The instrument was validated by experts, using the T-Retest method. Its reliability co-efficient was 0.89. The data collected were analyzed using frequency counts, mean and standard deviation, while independent sample T-test will be used to address the research Hypothesis.

The analysis of the data revealed the current state of student's exposure and experience with artificial intelligence in the realm of education in improving business education student's academic performance. The findings also underscore the awareness of business education students on various generative artificial intelligence and how it is being used to improve their academic performance. It was evident that AI has a substantial impact on various facets of business education students learning, including access to learning materials, customization of learning experience, collaboration, instant feedback, and the development of critical thinking and problem solving skills. The study also identified some key challenges such as laziness, lack of originality, examination malpractices, overdependence on technology, the ability to reduce classroom attendance and developing Erosion of Human Creativity. This research underscores the potential of generative AI in education and highlights areas for improvement in addressing the challenges that arise with its implication.

The following recommendations were made based on this finding; Authorities in Business Education department should recognize the challenges associated with the integration of AI in Business Education. Business Education department should invest in technical support and provision of materials needed for administering generative AI to business education students. Educators in business education department should receive trainings to adapt to new AI-based teaching methods, and a balance should be struck between traditional teaching and AI-based methods to ease the transition to harness the full potential of generative AI among business education students, Business Education

department should focus on creating more customized learning platforms and environments. This involves developing AI-driven tools and platforms that cater to individual learning needs and preferences, ultimately a more personalized and effective learning experience for each student in business education.

CHAPTER ONE

INTRODUCTION

Background to the study

Business Education is a component of Technical and Vocational Education and Training (TVET). The objectives of vocational and technical education as stipulated in the national policy on Education (2014) are: to provide trained manpower in applied science, technology and commerce particularly at sub-professional grades, to provide the technical knowledge and Vocational skills necessary for agricultural, Industrial, commercial and economic development, to provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man, to give an introduction to professional studies in Engineering and other technologies, to give training and impart the necessary skills leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant, and to enable our young men and women to have an intelligent understanding of the increasing complexity of technology, such as in Business Education.

Business Education is an aspect of education which prepares students or recipients for the world of work at the pre-vocational, vocational and professional levels. Many schools of thoughts have conceptualized business education in various ways with virtually all the views of all the authors similar in meaning. Manassy in Ekpenyong (2021) defined business education, as an aspect of the total education programme which

promotes skills, knowledge and understanding for one's performance in the business world as a consumer or producer. In his view, Abdullahi (2015) stated that Busunes Education is concerned with the area of knowledge and competencies needed by an individual - skills, abilities, understanding, and attitudes that enable students to become a worthy human being and effective member of the business community. Similarly, Nwazor (2018) viewed Business Education as an aspect of learning that prepares individuals for role in business and offer them knowledge about business. Furthermore, Obanya, (2017) asserted that business education is an educational programme offered at higher institutions which prepares students for careers in business by inculcating in them skills, knowledge about or useful in business world. According to Okolocha, Ile and Okolocha (2022), stated that Business Education has such options as accounting, secretarial education, commerce-cooperative, economics, marketing management; that trains students for office careers or occupations and for management of personal business ventures as entrepreneurs, distributors of goods and services, or users of information.

Accounting is the language of business and an integral aspect of all business activities. Accounting is a systematic recording, analysing, interpreting and presenting of financial information. Information gain from accounting helps in making good financial decisions. Marketing management as another option of business education, according to Philip Kotler (2018) defined marketing management as the analysis, planning, implementing and control of programmes designed to bring about desired exchange with

target market for the purpose of achieving organisation objectives. Secretarial education is also part of business education.

According to Aliyu (2020)), secretarial education is a vocational programme that is offered both in secondary school and tertiary institutions primarily to educate and train students to become competent secretarial teachers and secretarial administrators with appropriate skills. They ensure that each document they received is properly processed and filled, by using word processing for typing, editing or formatting document in an organized fashion. Another option of business education is commerce which relates to the exchange of goods and services, especially on a large scale. It includes legal, economic, political, social, cultural and technological system that operate in a country or in international trade.

Business Education programme are relevant programmes for human growth, development and sustainability. As a result of this view, introduction of Artificial intelligence (AI) on business education programmes could help to influencing business education student's academic performance since business education is a programme that is designed to produce business graduates with required knowledge, skills, attitudes and ability to cope with the challenging technology and business environment so as to be able to contribute meaningfully to the desired economic development of the country. Artificial intelligence (AI) is a vast branch of computer science concerned with developing intelligent computers capable of doing tasks that typically need human intelligence. AI is

the world's new trend as it has proved more efficient in many fields, mainly during the COVID-19 pandemic (Vaishya etal. 2020). AI has helped in fighting virus and globally rescued jobs and educational systems (UNESCO, 2020). Thus, it is vital to shedding light on how AI will influence one of the essential areas of life, Business Education student's Academic performance. The word intelligence can be explained by the following activities:

- Being able to learn new information
- Being able to manipulate information in different ways
- Understand and validate the manipulated information
- See relationships between data, considering meanings
- Being able to differ facts from beliefs. This is done by creating algorithms and providing data for a computer.

(Mueller & Massaron 2018) defined Artificial intelligence as intelligence that is reached in an artificial way, something that does not exist naturally, but is created as a copy of something that already exists, in this case the human intelligence in the Encyclopedia Britannica artificial intelligence is described as the capability of a computer or a computer-controlled robot to do things that normally require human intelligence and judgment, things that previously could have been done only by humans. Artificial intelligence (AI) has grown to be something that's a part of our daily lives, often in ways

we don’t even realize it. It makes our lives easier and solves problems we face. Everything from self-driving cars, smart home devices, and medical diagnosis to even news anchors created by AI, for some the intelligence can be hard to grasp. AI is also becoming more and more common in education, with different tools students and teachers can use for their advantage.

AI is reforming the methods students use for studying. Different study fields can benefit from AI tools in different ways. These tools can save time, function as a tutor, help dyslexic students, assist to write code, and it can even adjust to the student’s learning style. Improved outcomes, personalized learning, improved efficiency, Enhanced student engagement, Greater accessibility. Despite this advantages, there is a negative side that has commonly affect the performance of business education students. The commonly used Generative artificial intelligence by students today are:

- **ChatGPT**
- **Zenochat**
- **Grammerly**
- **Tutorme**
- **Textcortex**
- **Perplexity**
- **Quillbot**
- **Smart Sparrow**
- **Brainly**
- **Google Bard**

- **Altitude Learning**
- **Ivy Chatbot,** etc. which has contributed greatly to the academic performance of students.

The level of academic performance of student goes a long way in producing great graduates of business education. Academic Performance is an indicator that shows how successful a student and institution and a nation's educational system is. It is the measurement of student achievement across various academic subjects. This measurement is conducted by the teachers and educational officials using classroom performance, graduation rates and result of standardized test. Mesfin, Alex, and Getaneh, (2022) stated that academic performance is the extent to which a student, teacher, or institution has attained their long- or short-term educational goals and is measures either by continuous assessment or cumulative grade point average (CGPA). According to Ghaleb, Abdoulaye, and Shorouq (2021).

Kolawole and Dele (2002) noted that students' academic performance is one of the current educational problems of public interest based on current poor level of student's academic performance especially in various higher institutions. Over the years, the achievement of students in business education has continued to decrease and this has been an issue of concern to major stake holders in business education in Nigeria. Previous studies have found out that improvement in the academic performance of students is dependent on the combination of the student, teacher and parent factors (Amuzu, Ankalibazuk & Abdulai, 2017; Okolie, Elom, & Inyiagu 2015). Others have

also attributed it to environmental, psychological, personal, socio-economic factors (Malik & Sign, 2016; Mushtaq & Khan, 2015).

However, students should be taught on how to use artificial intelligence to their advantage on the level of creating a place for better academic performance and AI tools can help for educational purposes such as personal tutoring, personalized learning, and student performance analysis. AI algorithms can analyze student data, including learning preferences and performance data, it can be used to recommend personalized learning materials and interventions. Institutions can adopt AI-based learning management systems and adaptive learning tools to offer personalized learning. Personalized learning, gaining popularity for motivating and engaging students, is one of the primary benefits of artificial intelligence in the education sector. AI systems monitor students 'progress, spot their weak points, and offer tailored learning resources and suggestions.

It has been discovered that customized learning, which allows students to study at their own pace, improves academic performance. The presence of Artificial intelligence (AI) in the Education Market is significant, as demonstrated by its valuation of $4 billion in 2022. The integration of Intelligent Tutoring Systems (ITS) in the learning process and the growing partnerships with education content providers are among the key drivers contributing to this growth. AI has emerged as a powerful tool that has the potential to transform the education sector by improving the effectiveness, efficiency, and

accessibility of learning. Yes, like any innovation, the penetration of AI in the Education Market has shown to have positive influence on education (Garcia Mertinez 2023).

AI provides the advantage of organized information, allowing students to access knowledge from various sources effortlessly. With AI-powered systems, educational platforms can efficiently categorize and present information, enabling students to find relevant resources quickly and enhancing their learning experiences.

Statement of problem

Business Education is a programme that equip students with various skills, abilities, understanding and attitudes in order to enable them to become a worthy human being and effective member of the society. It also prepares students for the different roles in business as economically literate and intelligent citizens. Because it is a skill acquisition programme it is expected that student perform very well in it, this is because via their performance you can tell how it will help them work in the industry (World of work) or in a self-employed industry. Graduate of this programme with a very good academic performance are expected to do very well in the world of work. Ideally it is expected that business education students perform maximally, particularly when the necessary resources are put in place to stimulate their interest and enhance their learning outcome.

But unfortunately, recently it has shown that the performance of Business Education student is on a decline such that some of them are so disinterested in the course and some others feel they have a better option for a better career course that they wanted to opt for

but unfortunately they found themselves studying Business Education. Among this various degree of factors has brought about apparently poor academic performance in the programme and this poor academic performance obviously affect the product when they get to the world of work. A situation where by they find it difficult to get themselves in alignment with the various ICT gadget that controls every business organization. In other words, because they appear not to be taught with ICT gadget many of them lacks the Artificial Intelligence Mentality that ultimately rules the business word of today and if this poor orientation or acclimatization of ICT intelligence continues it is expected that their performance may continue to be on a decline and if it continues to be on a decline they are likely to have a half-baked product that will be working in the various organization and this would make the unemployment rate among business education students to be high than expected.

Conclusively, it may also affect the objective of Business Education programme towards its attainment, it is against this bad drop that Artificial Intelligence tends to determine the Influence of Artificial Intelligence on Business Education Students Academic Performance.

Purpose of the Study

The main purpose of this study is to determine the influence of artificial intelligence on business Education student's academic performance. It specifically determines:

1. The prevalent Generative Artificial Intelligence used by Business Education students in University of Benin.

2. The aspects of Business Education where Generative Artificial Intelligence are prevalently used.

3. The positive Influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin.

4. The Negative Influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin.

5. Factors mitigating against the use of Generative Artificial Intelligence in the learning of Business Education students of University of Benin.

Research Questions

The following are the questions posed by the researcher:

1. What are the prevalent Generative Artificial Intelligence used by Business Education students in University of Benin?

2. What aspects of Business Education where Generative Artificial Intelligence are prevalently used?

3. What are the positive influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?

4. What are the negative influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?

5. What are the factors mitigating against the use of Generative Artificial Intelligence in the learning of Business Education students of University of Benin?

Hypotheses

1. There is no significant difference between prevalent Generative Artificial Intelligence and The learning of Business Education in University of Benin.

2. There is no significant difference between the aspects of Business Education and The Generative Artificial Intelligence that are prevalent (Accounting, Marketing, and OTM).

3. There is no significant difference between the factors mitigating against the use of Generative Artificial Intelligence and learning by Business Education students of University of Benin?

Significance of the Study

The findings of this study would be relevant to the students, educators, parents, institution and even the nation at large. Its relevance, is of high importance, so this study would be made available and accessible to the above users of this information. The

copies of this study, could be found in the university library and made accessible for students. It could also be uploaded to various online or electronic library so parents, other students, educators and government can gain access to them.

It would help to enlighten the students about the influence of artificial intelligence in developing their Learning processes and the necessary artificial tools they can subscribe too. It would help educators (teachers and lecturers) to take note of the positive influence of artificial intelligence in developing their students' academic performance and how they can improve in the delivery of their lessons in order to ensure effective and efficient learning amongst learners. It will also enable educators to be able to guide their students on how to use artificial intelligence tools for effective learning performance and for the purpose of improving their academic performance. It would also help parents to understand their wards better, to see areas in which they can assist their wards and ensure they also contribute by providing for their wards to be able to have access to artificial intelligence tools.

It would help educational planners and institution to be able to understand what makes student perform the way they do in their academics and set in place structures, policies that can aid the students in having good performance. It would also be useful to government in numerous ways, as it will enlighten them on the need to address certain policies, as regards funds allocation for acquiring necessary artificial intelligence tools, better construction site that will be dedicated to machines (Computers) only.

Scope/ Delimitation of the Study

This study focuses on the influence of artificial intelligence on Business Education student's academic performance. The study covers the prevalent Generative Artificial Intelligence used by Business Education students in University of Benin, The aspects of Business Education where Generative Artificial Intelligence are prevalently used, The positive Influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin, The Negative Influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin, Factors mitigating against the use of Generative Artificial Intelligence on the learning of Business Education students of University of Benin.

The geographical area covered by this study is the University of Benin, Benin City Edo state. The study is delimited to Business Education students in the Department of Vocational and Technical Education, Faculty of Education. The main attention is to analyze the influence of generative artificial intelligence on business education student's academic performance on these specific students.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter covers the review of related literature under the following sub-headings:

- Concept of Artificial Intelligence
- Various Artificial Intelligence tools
- Concept of Business Education
- Academic Performance
- Related Empirical Review
- Summary of Review of Related Literature

CONCEPTUAL OF ARTIFICIAL INTELIGENCE

Artificial Intelligence

Artificial Intelligence (AI) is the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit characteristics we associate

with intelligence in human behavior – understanding language, learning, reasoning, solving problems, and so on." - (Barr & Feigenbaum, 1981). Artificial intelligence is the practice of computer recognition, reasoning, and action. It is all about bestowing machines the power of simulating human behaviour, notably cognitive capacity. However, Artificial intelligence, Machine learning, and Data Science are all related to each other.

In terms of easy definition, Artificial Intelligence is the capability of a machine or computer device to emulate human intelligence (cognitive process), acquire from experiences, adapt to the latest information and operate humans-like-activities. Artificial Intelligence executes tasks intelligently that yield in generating huge accuracy, adaptability, and productivity for the entire system. Tech decision-makers are seeking many ways to adequately implement artificial intelligence technologies into their businesses to draw interference and add values to them. For example, AI, in the media industry, is used at large scales, such as in social media, in automated journalism, etc. Another example can be seen at AI in banking applications like chatbots, mobile banking, fraud detection, customer engagement, etc. Apart from this, AI has various fundamental application incorporating NLP, healthcare, automotive, gaming, speech recognition, finance, vision system, etc. and required for; to design expert systems equipped with the knowledgeable practice that is proficient to acquire, manifest, decipher and justify to its users. Stimulating devices to identify results for complicated issues like humans do and implement them in the mode of algorithms in computers.

History of Artificial Intelligence

This technology is much older than you would imagine. Even there are the myths of Mechanical men in Ancient Greek and Egyptian Myths. Following are some milestones in the history of AI which defines the journey from the AI generation to till date development. Maturation of Artificial Intelligence (1943-1952) Year 1943: The first work which is now recognized as AI was done by Warren McCulloch and Walter pits in 1943. They proposed a model of artificial neurons. Year 1949: Donald Hebb demonstrated an updating rule for modifying the connection strength between neurons. His rule is now called Hebbian learning. Year 1950: The Alan Turing who was an English mathematician and pioneered Machine learning in 1950. Alan Turing publishes "Computing Machinery and Intelligence" in which he proposed a test. The test can check the machine's ability to exhibit intelligent behavior equivalent to human intelligence, called a Turing test. The birth of Artificial Intelligence (1952-1956). Year 1955: An Allen Newell and Herbert A. Simon created the "first artificial intelligence program “Which was named as "Logic Theorist". This program had proved 38 of 52 Mathematics theorems, and find new and more elegant proofs for some theorems.

Year 1956: The word "Artificial Intelligence" first adopted by American Computer scientist John McCarthy at the Dartmouth Conference. For the first time, AI coined as an academic field. At that time high-level computer languages such as FORTRAN, LISP, or COBOL were invented. And the enthusiasm for AI was very high at that time. The

golden years-Early enthusiasm (1956-1974). Year 1966: The researchers emphasized developing algorithms which can solve mathematical problems. Joseph Weizenbaum created the first chatbot in 1966, which was named as ELIZA. Year 1972: The first intelligent humanoid robot was built in Japan which was named as WABOT-1. The first AI winter (1974-1980). The duration between years 1974 to 1980 was the first AI winter duration. AI winter refers to the time period where computer scientist dealt with a severe shortage of funding from government for AI researches. During AI winters, an interest of publicity on artificial intelligence was decreased. A boom of AI (1980-1987)

Year 1980: After AI winter duration, AI came back with "Expert System". Expert systems were programmed that emulate the decision-making ability of a human expert. In the Year 1980, the first national conference of the American Association of Artificial Intelligence was held at Stanford University. The second AI winter (1987-1993). The duration between the years 1987 to 1993 was the second AI Winter duration. Again Investors and government stopped in funding for AI research as due to high cost but not efficient result. The expert system such as XCON was very cost effective. The emergence of intelligent agents (1993-2011). Year 1997: In the year 1997, IBM Deep Blue beats world chess champion, Gary Kasparov, and became the first computer to beat a world chess champion. Year 2002: for the first time, AI entered the home in the form of Roomba, a vacuum cleaner. Year 2006: AI came in the Business world till the year 2006. Companies like Facebook, Twitter, and Netflix also started using AI. Deep learning, big data and artificial general intelligence (2011-present). Year 2011: In the year 2011, IBM's

Watson won jeopardy, a quiz show, where it had to solve the complex questions as well as riddles. Watson had proved that it could understand natural language and can solve tricky questions quickly. Year 2012: Google has launched an Android app feature "Google now", which was able to provide information to the user as a prediction.

Year 2014: In the year 2014, Chatbot "Eugene Goostman" won a competition in the infamous "Turing test." Year 2018: The "Project Debater" from IBM debated on complex topics with two master debaters and also performed extremely well. Google has demonstrated an AI program "Duplex" which was a virtual assistant and which had taken hairdresser appointment on call, and lady on other side didn't notice that she was talking with the machine. Now AI has developed to a remarkable level. The concept of Deep learning, big data, and data science are now trending like a boom. Nowadays companies like Google, Facebook, IBM, and Amazon are working with AI and creating amazing devices. The future of Artificial Intelligence is inspiring and will come with high intelligence.

Two factors explain the new boom in the discipline around 2010. First of all, access to massive volumes of data. To be able to use algorithms for image classification and cat recognition, for example, it was previously necessary to carry out sampling yourself. Today, a simple search on Google can find millions. Then the discovery of the very high efficiency of computer graphics card processors to accelerate the calculation of learning algorithms. The process being very iterative, it could take weeks before 2010 to process

the entire sample. The computing power of these cards (capable of more than a thousand billion transactions per second) has enabled considerable progress at a limited financial cost (less than 1000 euros per card). This new technological equipment has enabled some significant public successes and has boosted funding: in 2011, Watson, IBM's IA, will win the games against 2 Jeopardy champions! ». In 2012, Google X (Google's search lab) will be able to have an AI recognize cats on a video. More than 16,000 processors have been used for this last task, but the potential is extraordinary: a machine learns to distinguish something. In 2016, AlphaGO (Google's AI specialized in Go games) will beat the European champion (Fan Hui) and the world champion (Lee Sedol) then herself (AlphaGo Zero). Let us specify that the game of Go has a combinatorics much more important than chess (more than the number of particles in the universe) and that it is not possible to have such significant results in raw strength (as for Deep Blue in 1997). Where did this miracle come from? A complete paradigm shift from expert systems. The approach has become inductive: it is no longer a question of coding rules as for expert systems, but of letting computers discover them alone by correlation and classification, on the basis of a massive amount of data. Among machine learning techniques, deep learning seems the most promising for a number of applications (including voice or image recognition). In 2003, Geoffrey Hinton (University of Toronto), Yoshua Bengio (University of Montreal) and Yann LeCun (University of New York) decided to start a research program to bring neural networks up to date. Experiments conducted simultaneously at Microsoft, Google and IBM with the help of the Toronto laboratory in

Hinton showed that this type of learning succeeded in halving the error rates for speech recognition. Similar results were achieved by Hinton's image recognition team. Overnight, a large majority of research teams turned to this technology with indisputable benefits. This type of learning has also enabled considerable progress in text recognition, but, according to experts like Yann LeCun, there is still a long way to go to produce text understanding systems. Conversational agents illustrate this challenge well: our smartphones already know how to transcribe an instruction but cannot fully contextualize it and analyze our intentions.

Branches of Artificial Intelligence as AI Capabilities

There is a broad set of techniques that come in the domain of artificial intelligence such as linguistics, bias, vision, planning, robotic process automation, natural language processing, decision science, etc. Let us acquire information about some of the major subfields of AI in deep;

1. Machine learning

In terms of advanced technology, one of the most demanding fields is Machine Learning, it is making buzz every day whenever a new product is introduced by any company that deploys ML techniques and algorithms for delivering the consumer in a highly creative manner.

Machine Learning is the technique that gives computers the potential to learn without being programmed, it is actively being used in daily life, machine learning applications in daily life, even without knowing that. Fundamentally, it is the science that enables machines to translate, execute and investigate data for solving real-world problems.

With the deployment of complex mathematical expertise, programmers design machine learning algorithms that are coded in a machine language in order to make a complete ML system. By this way, ML enables us to perform tasks to categorize, decipher and estimate data from a given dataset.

In the last few years, it has given us self-driving cars, image and speech recognition, demand forecasting models, useful web search and various extensive applications. It basically converges on the applications that adapt from experience and advance their decision-making potential or predictive accuracy over a period of time. Moreover, depending on the types of data available, data professionalists select types of machine learning (algorithms) for what they want to predict from data,

i. Supervised Learning: In this type of learning, data experts feed labelled training data to algorithms and define variables to algorithms for accessing and finding correlations. Both the input and output of the algorithm are particularized/defined.

ii. Unsupervised Learning: This type of learning include algorithms that train on unlabelled data, an algorithm analyzes datasets to draw meaningful correlations or

inferences. For example, one method is cluster analysis that uses exploratory data analysis to obtain hidden or grouping patterns or groups in datasets.

iii. Reinforcement Learning: For teaching a computer machine to fulfil a multi-step process for which there are clearly defined rules, reinforcement learning is practised. Here, programmers design an algorithm to perform a task and give it positive and negative signal to act as algorithm execute to complete the task. Sometimes, the algorithm even determines on its own what action to take to go ahead.

2. Neural Network

Incorporating cognitive science and machines to perform tasks, the neural network is a branch of artificial intelligence that makes use of neurology (a part of biology that concerns the nerve and nervous system of the human brain). Neural network replicates the human brain where the human brain comprises an infinite number of neurons and to code brain-neurons into a system or a machine is what the neural network functions.

In simple terms, a neural network is a set of algorithms that are used to find the elemental relationships across the bunches of data via the process that imitates the human brain operating process. So, a neural network refers to a system of neurons that are original or artificial in nature, where artificial neurons are known as perceptron, know from here, the complete perceptron model in the neural network.

A neuron in a neural network is a mathematical function (such as activation functions) whose work is to gather and classify information according to a particular structure, the network strongly implements various statistical techniques, such as regression analysis, to accomplish tasks. From forecasting to market research, they are extensively used for fraud detection, risk analysis, stock-exchange prediction, sales prediction and many more.

3. Robotics

This has emerged as a very sizzling field of artificial intelligence. An interesting field of research and development mainly focuses on designing and constructing robots. Robotics is an interdisciplinary field of science and engineering incorporated with mechanical engineering, electrical engineering, computer science, and many others. Robotics determines the designing, producing, operating, and usage of robots. It deals with computer systems for their control, intelligent outcomes, and information transformation.

Robots are deployed often for conducting tasks that might be laborious for humans to perform steadily. Major of robotics tasks involved- assembly line for automobile manufacturing, for moving large objects in space by NASA. AI researchers are also developing robots using machine learning to set interaction at social levels.

4. Expert Systems

Expert systems were considered amid the first successful model of AI software. For the first time, they were designed in the 1970s and after that escalated in the 1980s. Under

the umbrella of an AI technology, an expert system refers to a computer system that mimics the decision-making intelligence of a human expert. It conducts this by deriving knowledge from its knowledge base by implementing reasoning and insights rules in terms with the user queries. The effectiveness of the expert system completely relies on the expert's knowledge accumulated in a knowledge base. The more the information collected in it, the more the system enhances its efficiency. For example, the expert system provides suggestions for spelling and errors in Google Search Engine.

Expert systems are built to deal with complex problems via reasoning through the bodies of proficiency, expressed especially in particular of "if-then" rules instead of traditional agenda to code. The key features of expert systems include extremely responsive, reliable, understandable and high execution.

5. Fuzzy Logic

In the real world, sometimes we face a condition where it is difficult to recognize whether the condition is true or not, their fuzzy logic gives relevant flexibility for reasoning that leads to inaccuracies and uncertainties of any condition. In simpler terms, Fuzzy logic is a technique that represents and modifies uncertain information by measuring the degree to which the hypothesis is correct. Fuzzy logic is also used for reasoning about naturally uncertain concepts. Fuzzy logic is convenient and flexible to implement machine learning techniques and assist in imitating human thought logically. It is simply the generalization of the standard logic where a concept exhibits a degree of truth between 0.0 to 1.0. If the

concept is completely true, standard logic is 1.0 and 0.0 for the completely false concept. But in fuzzy logic, there is also an intermediate value too which is partially true and partially false.

6. Natural Language Processing

It is hard from the standpoint of the child, who must spend many years acquiring a language … It is hard for the adult language learner, it is hard for the scientist who attempts to model the relevant phenomena, and it is hard for the engineer who attempts to build systems that deal with natural language input or output. These tasks are so hard that Turing could rightly make fluent conversation in natural language the centerpiece of his test for intelligence.

The Five Basic Components of AI, New Software Development

Despite the number of products and services that utilize artificial intelligence in their respective functions, many people may be wondering about the different components that allow AI to function in the first place. With this being said, while the development of artificial intelligence is a nuanced and complex process, it does not differ from any other machine or system in that there are basic rules that govern its operation. As such, the five basic components of artificial intelligence include learning, reasoning, problem-solving, perception, and language understanding. Through the implementation of these five basic components, software developers and engineers have been able to create a multitude of technologies and services that consumers around the globe have come to covet and revere.

1. Learning

Just as is the case with human beings, the first step in the development process as it pertains to artificial intelligence is the learning stage. For example, when teaching a child how to ride a bicycle for the first time, there will be a trial and error process in which the child makes mistakes and falls off their bike, gradually learning the rules and techniques that are needed to effectively handle the task at hand. In the context of the development of artificial intelligence, the learning process involves the memorization of individual items including different solutions to problems, vocabulary, and foreign languages, among others. Through this learning process, programs that utilize artificial intelligence are able to keep notes of all actions or moves that led to positive results, allowing the program to leverage this knowledge within its data should similar problems arise in the future.

2. Reasoning

The second major component of artificial intelligence is reasoning. While the concept of mental reasoning is something that has largely been limited to the human mind for much of recorded history, much of the development of artificial intelligence hinges on software programs that are able to draw conclusions and inferences from a situation, without the need for human interference. Furthermore, these inferences are divided into two categories, inductive and deductive reasoning. To this point, the use of inductive reasoning has allowed computer programmers and software developers to create products

and systems that achieve consistent results when faced with a particular problem or issue, whether this is in terms of a broad topic such as automatic transcription and translation, or a more niche application such as the cloud-based grammar and writing assistant Grammarly.

3. Problem-solving

The third major component that makes up the development of artificial intelligence programs and systems is problem-solving. As the entire premise of artificial intelligence is the creation of computer programs and systems that solve problems in a manner similar to that of human beings, problem-solving is perhaps the most pivotal component in terms of the development of AI. In the most basic of terms, an AI's problem-solving ability is based on the application and manipulation of data, where the solution needs to be x. Alternatively, in more advanced applications, problem-solving techniques in the context of AI can include the development of efficient algorithms, performing root cause analysis with the goal of discovering a desirable solution, and heuristics.

4. Perception

The fourth major component in the development of artificial intelligence programs and systems is perception. In keeping with comparisons to the function of the human mind, the way in which individuals perceive the world around them is critical to the manner in which they solve problems in their respective lives. As it relates to artificial intelligence, perception is achieved through the utilization of different sense-organs, whether they be

real or artificial. As human perception itself is extremely complicated, enabling artificial intelligence programs to perceive certain inputs and information can prove to be extremely challenging. To provide a real-world application of perception in terms of artificial intelligence, many self-driving cars function through the perception of different physical objects within a given environment, ranging from traffic lights, weather conditions, buildings, and highways and roads, just to name a few. Language understanding.

The final component that makes up the development of artificial intelligence is language understanding. Put in the simplest of terms, language understanding in the context of the development of artificial intelligence can be defined as a set of different systems signs that justify their various means or methods using convention. To this point, as the vast majority of artificial intelligence programs and systems are developed within the English-speaking world, a major component of the creation of many such programs and systems is enabling them to understand the English language. Through this language understanding, software developers are able to ensure that computer programs are able to efficiently execute their respective functions and operations.

The Importance of Artificial Intelligence on Education for All Students

With the advent of ChatGPT, Google Bard, Midjourney and Canva's magic features, artificial intelligence (AI) is quickly becoming an integral part of our everyday lives, transforming industries and reshaping the way we work, learn and communicate.

This rapid technological advancement highlights the importance of incorporating AI education into the curriculum not only to ensure that all students are well-equipped for their academic futures but also for workforce development. With that in mind, it is crucial to consider underrepresented populations as these students are typically left out of the newest technological advancements.

AI Support for Teaching

AI has the potential to revolutionize the education sector by enhancing learning experiences, supporting teachers and offering more personalized learning opportunities for students. We must equip teachers with the knowledge and strategies they will need to use this new technology to improve and streamline everyday processes as well as classroom implementation. Some areas in which AI can transform the classroom include personalized learning, ideation, adaptive learning, special needs education, bilingual education, gamification and immersive learning.

Personalized learning involves AI-powered systems that analyze students' learning styles, strengths and weaknesses to create tailored lesson plans and suggest resources to serve their individual needs.

Adaptive learning platforms can adjust to each student's progress in real-time, identifying gaps in knowledge, providing immediate feedback, and suggesting targeted interventions to help students master the material. AI can also help teachers automate administrative tasks, enabling them to focus more on instruction and student interaction.

Furthermore, AI-powered virtual tutors can provide round-the-clock support to students, while customized learning solutions can empower students with special needs to reach their full potential. Gamification and immersive learning experiences can make education more engaging, fun and memorable. AI-driven language translation tools can break down communication barriers, enabling students and educators from different countries or with different languages to collaborate on projects and learn from one another.

All means all. Teaching students about AI is essential for developing digital literacy, critical thinking skills, and preparing students for future academic and career success. A basic understanding of AI systems enables students to engage and ideate with AI technologies safely, responsibly and ethically. Learning about AI also encourages students to analyze and evaluate question structure, complex information, question assumptions and consider the ethical implications of AI technology usage.

Moreover, AI is transforming the job market, with increasing demand for professionals skilled in AI and related fields. Teaching students about AI can help them develop the knowledge and skills needed to pursue careers in technology, data science and other in-demand industries. AI learning can inspire students to generate ideas and solutions, fostering creativity and innovation essential skills in today's competitive and evolving job market.

It is particularly important to not exclude AI education from underrepresented student populations. In fact, it is vital to integrate diversity, equity and inclusion within

this domain to ensure that a broad perspective of values are embraced to combat digital bias and discrimination. Providing students with access to AI education can help close opportunity gaps, ensure they have the skills and knowledge to compete in the global workforce, and create a more diverse pool of talent in AI and related fields. This diversity can lead to better problem-solving, creativity and innovation in the development of AI technologies and solutions. AI education can empower underrepresented communities to leverage technologies for social good and drive positive change in their local and global contexts. Lastly, ensuring underrepresented populations are well-versed in AI positions them to contribute to policymaking and decision-making processes, shaping the rules and regulations governing AI applications.

Risks of Excluding Students from AI Education

Excluding any student group – either deliberately or by neglect – from learning how to leverage artificial intelligence can lead to several negative consequences, both for individuals and society at large. Following are some of the dangers associated with excluding students from AI education.

• **Digital divide –** Excluding students from learning about AI can contribute to the digital divide, as they may not have the knowledge and skills needed to navigate AI-driven technologies in their daily lives. This can hinder their ability to access information, participate in the digital economy and engage with online communities effectively.

• **Biased AI systems –** AI systems often are trained on data collected from human behavior, which can contain biases. For example, facial recognition originally was designed exclusively with white faces because the developers were not diverse. Excluding diverse perspectives from the development and design of AI systems can perpetuate or amplify existing biases, leading to unfair or discriminatory outcomes for certain groups of people.

• **Wider skills gap** – As AI becomes increasingly important in various industries, the demand for professional skills in using AI will grow dramatically. Excluding students from AI education can exacerbate the skills gap, making it more difficult for businesses and organizations to find the diverse talent they need to thrive in the AI-driven economy.

• Economic inequality – Students who lack AI education may find it more challenging to secure well-paying jobs as many traditional roles may be automated or significantly transformed by AI. This can lead to increased economic inequality and limit social mobility for those who are not adequately prepared for the AI-driven job market.

• **Loss of creativity and innovation** – A diverse workforce in AI and related fields leads to more creative problem-solving and innovative solutions. By excluding certain students from AI education, we risk losing the valuable insights and ideas that they could bring to the development of AI technologies.

• **Ethical concerns** – As AI becomes more integrated into our lives, it is essential to have a diverse group of professionals involved in the development and regulation of AI

systems to ensure ethical considerations are taken into account. Excluding students from learning about AI may result in a lack of diverse perspectives, leading to potential ethical issues and unintended consequences. It also leaves students unprepared to navigate ethical dilemmas.

To mitigate these dangers, it is essential to promote equitable access to AI education for all students, regardless of their background or socioeconomic status. This will help to ensure that everyone has the opportunity to benefit from the advancements in AI and contribute to a more inclusive and just society.

Concept of Business Education

Business Education is an integral part of vocational Education which is the education for employability. The Federal Government of Nigeria (2013) recognized it as such and defined it as the aspect of Technical Education which involves in addition to general education, the study of technologies and related sciences; the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of the economy and social life. According to Azuka, Nwosu, Kanu and Agomuo (2016) and Odah and Ogbaga (2017), unlike general education which is long in theory and short in fact, Business Education is practical oriented and provides individuals with

skills in business related occupations such as accounting, marketing and office occupation.

Furthermore, business education is concerned with the era of knowledge and competences needed by individuals (Skills, abilities, Understanding and attitudes) that enables students to become a worthy human being and effective member of the society (Etonyeaku, 2016). It prepares learners for the different roles in business as economically literate and intelligent citizens. As part of vocational education, Business Education is synonymous with skill acquisition (McOmish, Elspeth, Mohan and Perera, 2023). The author's noted that in the absence of paid employment, individuals with vocational skills can set up small scale business with the services needed by their communities and this has the capacity to boost the local economy from within, and hence lead to the liberation of the people from the culture of dependence on external assistance. The authors further stated that as an aspect of vocational Education, Business Education is the key that alleviates poverty, promotes peace, conserves the environment, improves quality of life for all and helps in the achievement of sustainable economic development.

Business Education prepares individuals for life-long learning by developing in them the necessary mental tools, technical and entrepreneurial skills and attitudes, capacity for decision-making and other qualities needed for active participation in team work and in the community as a whole. Business Education empowers graduates with desired skills, knowledge and values that would make such graduates to be self-employed

or employable by others. Okorie (2017) and Ezeji (2019) attributed that with the recent trend in technology called artificial intelligence can definitely influence the learning, experience, development and academic performance of business education students. It is necessary to point out that Business Education is a wide discipline which encompasses a number of specialist areas. For example, stenographic/secretarial studies, accountancy, business management/computer studies, marketing and/or distributive education are all areas of business education. In addition, what immediately comes to mind when the term that Business Education is used is the teaching aspect of the discipline and that is, business teacher education. There is also the distinction which is often drawn between vocational business education (i.e. education for business) and general business education about business).

Vocational business education is for business majors and emphasizes job competency, career preparation and work adjustments. Subject such as Accounting, Advanced Type-writing, Data processing/Word Processing, Distributive Education, Office procedure, secretarial procedures and shorthand are taught to achieve this desired result. General Business Education is designed for all students and it emphasizes economic competency (literacy), career exploration and social adjustment. The appropriate subjects that could be taught for achieving the purpose include Basic Business Beginning Typewriting, General business, Business Law, Consumer Economic, Introduction to Business and Marketing.

Anao said that Business education could very simply mean'' an educational process or content which has its primary aim as the preparation of people for roles in business enterprise; such roles could be as employee, entrepreneur/ employer or simply as self-employed,'' From a narrower perspective, he construed Business Education to mean "the sum total of the knowledge skill and attitude that are required for successfully promoted and administering business enterprise;

Nolan indicates that Business Education involves the study of book-keeping, typewriting, shorthand, general business and business law beginning at the secondary school level. At post-secondary level, Kano states that it involves the study of accounting, marketing, office administration, secretarial studies and finance. In his view, Ulinfun notes that Business Education means education for and about business, or training in business skill and competence required for use in business office, clerical occupation and business policy analysis. It is a training that gives an occupational identity. pophamental added that Business Education prepares students for entry into and advancement in jobs within business, and equally important, it prepares students to handle their own business affairs and to function intelligently as consumers and citizens in a business economy.

Care has been taken to explore all areas of the definition of business education, to ensure a balanced view of the subject matter. We can simply say by way of summary that business education can be divided very broadly into two perspectives to mean;

Business skills, attitudes and knowledge acquired from secondary and post-secondary institutions for performing business operations of a personal or corporate nature; and Business teacher education competencies acquired from the colleges of education and the universities with business teacher education programme.

Aim of Business Education

Following the discussions so far about Business Education. We can identify the goal of business education as the production of manpower who the requisite knowledge, skill and attitude for harnessing other resources and bringing them into a co-operative relationship, yielding the goods and services demanded by society for the satisfaction of their wants and needs (Anao). Nwakolo added that Business Education is aimed at turningout the right caliber of work force with business and entrepreneurial ability for positions in various sectors of the economy. The above statements are non-pedagogic. A third must be provided to water for business teacher education. Therefore, the aim of business education can additionally be stated as the provision of teachers with adequate skills, and pedagogy needed for imparting business skills, knowledge and attitudes to business education students in the secondary schools or in the tertiary institutions. Following the practice of business education in this country and its very close links with business education in the United States of America, it will also be appropriate to endorse in this country the mission of business education as outlined by the National Business Education Association in America which Hosler (1985) sates are:

• To educate individuals for and about business

• To provide a continuous programme of planned learning experience designed to equip individuals to fulfill effectively their roles as workers, consumers, and citizens.

• To provide educational information that helps students relate their interest, needs and abilities to occupational opportunities in business.

• To provide educational opportunities for students preparing for career infields other than business in order to acquire business knowledge and skills needed to function effectively in those careers. Additionally, Business Education regulate methodology that can be used to enhance the Influence of artificial intelligence on business education students academic performance. The main goals of business education programs are to teach the processes of decision making; the philosophy, theory, and psychology of management; practical applications; and business start-up and operational procedures.

Concept of Academic Performance

Academic Performance is the measurement of student achievement across various academic subjects. It is an indicator that shows how successful a student and institution and a nation's educational system is. Academic performance of the students can be measured through test, course grade or standard test score etc. According to Pandey (2018) stated that academic performance means the performance of the learners in school

in some specific subjects. Precisely, it is linked with mental growth and development of the students in teaching and learning process.

Poor academic performance, according to Aremu and Sokan (2016) is a performance that is adjudged by the examinee as falling below an expected standard. Igberadja (2016) acknowledged the worrisome level of poor academic achievement of students in vocational technical education subjects in Nigeria. May, Ajayi, Arogundadade, and. Ekundayo, (2017) observed that business education are very much still neglected which consequently is robbing the country of the economic development to be contributed by graduates of business education.

The origins of measuring academic performance in the United States date back to the 1830s. Education advocates Horace Mann and Samuel Gridley Howe used a standardized test to evaluate student progress in Boston, Massachusetts. Kansas school administrator Frederick J. Kelly advanced the idea of standardized testing with the Kansas Silent Reading Test in 1914. This multiple-choice test was used to decrease grading time and standardize student evaluations. IBM employee Reynold B. Johnson developed a grading machine in 1934 that could grade test sheets by picking up the electrical current created by pencil marks. Henry Chauncey developed the Scholastic Assessment Test (SAT) in 1934 to evaluate scholarship candidates at Harvard University and University of Iowa Professor E.F. Lindquist created the first version of the American College Test (ACT) in 1959.

The Elementary and Secondary Education Act (ESEA) of 1965 encouraged adoption of standardized testing by all states. This legislation required states to measure student proficiency and develop accountability measures for public schools. The No Child Left Behind Act (NCLB) of 2001 continued the ESEA's focus on accountability by requiring states to ensure minimum proficiency levels in order to receive federal funds. In 2015, President Barack Obama (D) signed the Every Student Succeeds Act, replacing the NCLB and reauthorized the ESEA. Under the ECSA, states had more input than under the NCLB over how much standardized tests count toward school ratings. The ECSA allowed states to include, in addition to tests, factors such as graduation rates, English language proficiency, or access to advanced coursework. Brown University education scholar Kenneth Wong said: "In comparison with the earlier NCLB, the ESSA shifted from a policy system defined by federal mandates to one with state flexibility."

Method of Measurement

Student performance can be measured using a variety of benchmarks, including grade point average (GPA), high school graduation rate, annual standardized tests, and college entrance exams. A student's GPA is typically measured on a scale of zero to four. State and federal education officials collect graduation rates to use as a baseline measurement of secondary education performance. Each state conducts annual tests at the

elementary, middle and high school levels to determine student proficiency in subjects like English and mathematics. These tests are also used to comply with federal education standards. School districts also track student performance on the ACT and SAT to determine readiness for higher education.

Under the ESSA, states are required to submit plans to the U.S. Department of Education containing a minimum of five indicators for measuring student and school progress. The law mandated the first four indicators—academic achievement, academic progress, English language proficiency, and high school graduation rates. The law allowed states to choose a fifth measure in one of the following areas: kindergarten readiness, access to and completion of advanced coursework, college readiness, discipline rates, and chronic absenteeism.

Identification of Factors Influencing Students' Performance

In the pre-AI era, we had some idea that apart from the academic features of a student, various other features relating to his or her social life, demography, surround-ing environment and so on may play an important role in his or her performance. But as these factors are not easily measurable, it was impossible to extract their relations formally. With the advancement of technology, we are now able to apply various important AI

techniques into the education held to extract these important relations. Also, various factors that we couldn't think of at that time came to light as important causes of a student's high or low performance, with the help of AI technologies. For the past decade, scientists have been conducting research to discover the hid-den relationships between various factors (aside from academic ones) with students' academic performance. When we look deep into the literature of Indian studies on students' performance assessment, researchers are looking for various aspects in an educational or non-educational setup affecting a student's performance. Two renowned professors, B.K. Baradwaj and S. Pal, from Purvanchal University, Uttar Pradesh, conducted research on the same students at the university in 2021 (Baradwaj & Pal, 2021). They explored various academic factors such as "Previous semester marks", "Class-test grades", "Seminar performance", "Assignments", "General proficiency", "Attendance", "Lab work" and "End semester marks" and extracted the relationship these factors reveal with a student's performance. With the database of previous years' students, they were able to predict current students' per-formance efficiently. In the same year, two professors, R. R. Kabra and R.S. Bichkar from S.G.R College of Engineering and Management, Maharashtra, conducted research (Kabra & Bichkar, 2021) on students at the same college and discovered that many personal factors like "Mother's Occupation" and "Father's Occupation" also play an important role in a student's academic performance. Their model achieved success in identifying students who were likely to fail, and their work was used to improve performance.

Various Artificial Intelligence Tools

AI tools are software that utilizes artificial intelligence models like natural language processing, machine learning, and computer vision. They are compatible with various operating systems, including Android, iOS, Windows, Linux, and MacOS. This means that users can benefit from AI tools regardless of the device they are using.

How to Use AI Tools in Education?

Although AI tools are used for different purposes in business sectors, their use examples for education are limited. Educational institutions such as Khan Academy offer online AI tutor experience to students by developing AI chatbots. Individual users can also create personal AI tutors using AI chatbots and use them for education. Students can produce academic papers using AI writing tools. Thus, students can focus on the content itself instead of dealing with various writing formats. By taking advantage of all AI tools' features, you can improve your academic writing and increase the efficiency of your learning process.

How Do AI Tools Help Students in Education?

AI tools can be used to identify students' individual capabilities and weaknesses, allowing for the creation of personalized education plans that focus on maximizing each student's productivity while reducing the time spent on these tasks.

Not every student has access to a personal tutor. However, thanks to the development of AI technology, it is possible to modify conversational AIs such as ZenoChat and ChatGPT as tutors. Thus, each student can increase their performance with the personal tutor and practice on the topics they need.

Are AI Tools Good or Bad in Education?

The effectiveness of AI tools is entirely dependent on their users. Students can leverage AI tools to enhance their learning and improve their academic performance. Conversely, if students rely on AI tools as a shortcut to completing homework quickly, it could negatively impact their education.

AI use cases in the Education Landscape

We are witnessing the use of AI technology in different ways in the field of business. But what if we try to use AI tools for education? If you're wondering about the answer to this question, we have listed some examples of the use of AI in education for you!

• AI Tutor

The most popular use case of AI for education is to use AI chatbots as personal tutors. The AI tutor trend, which started with Khan Academy, has been opened to

everyone with customizable conversational AIs. AI chatbots are more advantageous than human tutors, both because they are more affordable, and they are always accessible.

• Writing Assistant

Students are often tasked with writing essays throughout their academic careers to further their understanding of literature and expand upon the knowledge they have acquired. One of the main issues associated with this type of writing is the challenge of expressing ideas without plagiarizing. To remedy this, students can utilize AI writing tools which offer paraphrasing options so that they can focus on content rather than spending energy on rewording sentences.

• Better Research

One of the main characteristics that define students is that they constantly research different topics. As a student, it is necessary to search various sources, scan the literature and learn different views on the subject to access the right information. This process can sometimes take a few hours or even weeks. It is possible to use AI tools to speed up this research process and reach accurate information. You can search for academic resources on any given subject by using AI chatbots with a web search feature.

The Most Useful AI Tools for Education

Not every AI tool can produce high-quality and accurate output, just as not every AI tool is suitable for completing every task. For this reason, you should use advanced AI tools

for education. The more features an AI tool possesses, the more useful it becomes. They are explained below:

• ZenoChat

ZenoChat is ideal for educational purposes as well as any other purpose you may have in mind. Another useful features of Textcortex is the Zeno Assistant. With the Zeno Assistant, you can complete various writing tasks, from continuation sentences to spelling and grammar fixes, from outline creation to text generation.

• Quillbot

Quillbot is an AI tool with various features that you can use for essay writing. Using Quillbot, you can rewrite your paragraphs, check grammar and spelling, check the plagiarism of your text, and even get citations. If you are looking for an AI tool to use while creating your academic papers, we recommend giving Quillbot a shot.

• Grammarly

Grammarly has been a popular tool for years, known for its ability to fix spelling and grammar errors and offer writing suggestions. By utilizing Grammarly, you can enhance your writing quality by correcting spelling mistakes and receiving helpful suggestions. Additionally, the tool includes a plagiarism checker, which verifies the originality of your essays. Say goodbye to writing errors and hello to polished, original content with Grammarly.

• **TextCortex**

TextCortex is an AI assistant that can be used for different purposes with its various features. It is available as a web application and browser extension. Also, it is integrated with 4000+ websites and apps. So, you can continue to use TextCortex on any webpage and device.

TextCortex provides the best experience to users by learning about users' preferences, needs and habits with its advanced algorithms. For this reason, as you continue to use TextCortex for education, you will notice that you get more related output.

• Knewton Alta continuously monitors students' mastery and adapts in real time to maximize their learning outcomes. When students struggle, Knewton Alta recognizes knowledge gaps immediately and delivers precisely what students need at the moment they need it. Knewton Alta is an adaptive learning courseware tool that helps students address knowledge gaps and engage with subject matter more effectively. Knewton Alta is accessible, affordable, and adaptive courseware that provides students with the support they need at the moment they need it.

• **Perplexity**

The inability to deal with or understand something complicated or unaccountable. Perplexity is a feeling of being confused and frustrated because you do not understand

something. The role of “perplexity” is an important concept to grasp because it serves as the basis for why people continually seek to gain knowledge. The confusion brought upon by being taught a certain subject but not being able to fully understand it creates the perplexity complex and forces people to try and learn just what it is they are perplexed about and as a result, gain knowledge by obtaining missing information. For example, in the text, Socrates attempts to break down this perplexity when he says “I still want the two of us to try to find out what [being good] is” (80d). The perplexity is represented by the state of what it means to be good and it plays the role of encouraging Socrates and Meno to figure it out. Therefore, perplexity influences the increase of knowledge by creating a window of unknown that has yet to be discovered and learned.

• AI algorithms

With AI algorithms, teachers can gain insights into each student's strengths and weaknesses, allowing them to tailor their instruction accordingly. Moreover, these platforms have proven instrumental in identifying areas where students require additional support. AI algorithms can analyze student data and adapt to their learning styles, providing feedback and recommendations that are tailored to their individual needs and abilities. This can help to keep students engaged and motivated and can lead to improved academic performance.

"Algorithms of Education is an essential guide to the possibilities and political implications of artificial intelligence in education policy and governance. Working with

ambitious concepts and innovative methods, the authors provocatively ask how education can be governed when policies are implemented by humans and automated machines that think and make decisions together." —Ben Williamson, University of Edinburgh.

Algorithms of Education explores how, for policy makers, today's ever-growing amount of data creates the illusion of greater control over the educational futures of students and the work of school leaders and teachers. In fact, the increased datafication of education, the authors argue, offers less and less control, as algorithms and artificial intelligence further abstract the educational experience and distance policy makers from teaching and learning. Focusing on the changing conditions for education policy and governance, Algorithms of Education proposes that schools and governments are increasingly turning to "synthetic governance"—a governance where what is human and machine becomes less clear—as a strategy for optimizing education.

• ChatGPT

ChatGPT is an artificial intelligence (AI) tool that uses natural language processing techniques to respond to user-generated prompts. The "GPT" initials stand for generative pretrained transformer. ChatGPT is an AI program that uses generative coding to receive, analyse, and produce a response that mimics human natural language. The program uses a transformer-based neural network with a massive database to analyse the input information and create a response. When a human user enters questions or commands

into ChatGPT, the AI processes the text and generates the response based on the neural network data.

ChatGPT can have in-depth conversations, admit mistakes, and even write essays. While it can be a valuable tool due to its depth of knowledge, many in the education field wonder how ChatGPT will affect ethics, effort, credibility, and the overall future of learning and teaching

How can teachers use ChatGPT?

1. Personalised instruction ChatGPT can provide personalised assistance to students by answering their questions, clarifying concepts, and offering additional explanations. Teachers can integrate ChatGPT into online learning platforms or classroom tools to offer on-demand support. However, ChatGPT would provide a quick, concise, and direct answer that students could read in real-time. In this way, it can complement the discussions and give teachers answers in real-time.

2. Virtual tutoring ChatGPT can act as a virtual tutor, providing guidance and feedback to students outside of regular class hours. It can help with homework, provide practice exercises, or offer explanations for complex topics. Although AI should not replace a teacher's lessons, it can serve as a practice tool for teachers to use in the classroom with something new to offer.

3. Evaluations the tool can create evaluations. Teachers can input information into the AI program and provide context, and ChatGPT will generate a result. Although it may require some fine-tuning, it can be a great starting point for teachers to use when creating assessments from scratch.

4. Automation is everywhere, and it can help teachers streamline one of the most time-consuming tasks—grading. ChatGPT can grade and provide feedback on assignments, giving teachers more time to create engaging academic plans and focus their attention on students.

5. Grammar and writing assistance Teachers can use ChatGPT to help students enhance their writing skills. Students can seek feedback on their essays, receive suggestions for improving their writing style, or get ideas for creative writing assignments. In the age of social media and text language, it can be difficult for teachers to teach students grammar and writing. ChatGPT provides instant feedback for students, which can help them improve their writing skills. AI can be used as a practice tool for teachers to employ in the classroom and give pupils something fresh, even if it shouldn't replace a teacher's lessons.

A comparative analysis of AI assistants how can students use ChatGPT?

1. Assistance with assignments ChatGPT serves as a valuable resource for students seeking help with their homework. By posing questions or problems, students can receive

quick responses and guidance. It is basically similar to using Siri, Google Assistant, or other virtual assistants.

2. Improving writing skills Just like popular writing tools such as NoRedInk or Grammarly, ChatGPT can assist students in enhancing their writing abilities. Students can input sentences and request ChatGPT to provide corrections and suggestions for improvement.

3. Feedback and editing Students can utilise ChatGPT for receiving feedback on their essays or assignments. By copying their work into the text box and students can ask the ChatGPT to analyse and provide constructive feedback and allowing them to make necessary revisions before submitting their final work.

4. Research ChatGPT is very smart and equipped with vast resources. That being said, its database is based on internet sources, some of which are inevitably inaccurate. This means that students must use ChatGPT as a Wikipedia-type source. It can be a great way to build general knowledge and serve as a starting point, but it can't really be used as a citable source. The future of ChatGPT in education the future of ChatGPT in education holds immense potential for transforming the learning experience.

Here are some key aspects of ChatGPT's future in education:

1. Personalised learning ChatGPT can adapt to individual students' needs, providing tailored instruction and support. As technology advances, it will become even better at

understanding students' learning styles, preferences, and knowledge gaps, enabling more personalised and effective learning experiences.

2. Ethical and inclusive AI as ChatGPT evolves, there will be a growing emphasis on ensuring ethical use and addressing biases. Efforts will be made to enhance inclusivity and cultural sensitivity, allowing ChatGPT to provide equitable learning experiences for students from diverse backgrounds.

3. Multilingual education ChatGPT's language capabilities can promote multilingual education. It can help students learn different languages by engaging in conversations, providing language-specific feedback, and facilitating language acquisition through interactive practice. While ChatGPT's potential is promising, it's important to strike a balance between leveraging AI technology and preserving the human element in education. The future integration of ChatGPT should aim to enhance and complement traditional teaching methodologies, fostering a harmonious co-existence between human educators and AI-powered learning tools.

What else can ChatGPT do?

Design (and attempts to solve) math and science word problems.

• Role play class scenarios.

• Remix student work.

• Provide writing examples.

• Give students feedback on their writing.

• Provide tips on how to personalize/differentiate learning.

• Generate discussion prompts for class.

• Provide one-on-one tutoring or coaching.

• Write letters to parents (K-12 teachers) or students.

• Google Bard

Google Bard is a large language model from Google AI, trained on a massive dataset of text and code. It can generate text, translate languages, write different kinds of creative content, and answer your questions in an informative way. Teachers can use Google Bard to create interactive learning materials, such as quizzes and flashcards, as well as to provide feedback to students on their work. Bard can also be used to generate creative content, such as poems, stories, and scripts. Google Bard is a powerful tool that can be used to enhance the teaching and learning process. It is still under development, but it has the potential to revolutionize the way that teachers teach and students learn.

Ten Ways to Use Google Bard

• Content Creation: Teachers can use Google Bard to create educational content such as lesson plans, quizzes, and assignments.

• Real-time Feedback: Google Bard can analyze student performance in real-time, helping teachers to provide immediate feedback during lessons.

• Performance Analysis: Teachers can use Google Bard to analyze student performance over time, helping to identify areas where students may need additional support.

• Interactive Learning: Teachers can use Google Bard to create interactive learning experiences, such as quizzes and games that can engage students and enhance their understanding of the subject matter.

• Personalized Learning: Google Bard can help teachers to create personalized learning experiences for students, tailoring the content and activities to each student's individual needs and abilities.

• Collaborative Learning: Teachers can use Google Bard to facilitate collaborative learning experiences, enabling students to work together on projects and assignments.

• Resource Recommendation: Google Bard can recommend relevant resources such as articles, videos, and websites that can supplement the teaching material.

• Language Translation: For multilingual classrooms, Google Bard can help in translating content, aiding in clearer communication with students who speak different languages.

• Professional Development: Teachers can use Google Bard to stay updated with the latest trends and research in education, helping them to continuously improve their teaching practices.

• Parent Communication: Teachers can use Google Bard to gather information or statistics that can be shared with parents during meetings or in newsletters, helping to keep them informed about their child's progress and the classroom activities.

Related Empirical Studies

This aspect deals with the review of empirical literature that has been carried out in relations to the aspect of the influence of artificial intelligence on business education students' academic performance.

Anuoluwapo (2022) carried out a research work on the total number of 2,000 Business Education students represented the study's population, while a simple random sampling technique was adopted in selecting a sample of 1,000 respondents. Business Education Students' Satisfaction with the Study of ICT Questionnaire (SSSSSICTQ)" was used primarily as the tool for data collection. Majority (64.2%) of the respondents had good academic achievement, CGPA of 3.1 and above. Results of chi-square analysis showed that socioeconomic characteristics of the respondents have significant relationship with the students‟ academic achievement at $p < 0.05$. Similarly, there is significant relationship between parental background and home related issues and the students‟ academic achievement at $p < 0.05$. Significant association existed between adequacy and functionalities of school facilities and the students‟ academic achievement

at $p < 0.05$. There is significant relationship between reading habits of the students and the students‟ academic achievement. Relationships between the teachers‟ effectiveness and students‟ academic achievement were also significant at $P < 0.05$. The paper therefore recommended that parents should give moral and financial support to the students, Colleges of education should be supported and well-funded by the government at all level to create conducive environment for teaching-learning process and Government should provide artificial intelligence training for all practicing teachers and they should also be taught how they can use internet technology for enhancing teaching-learning process across all levels of Nigeria educational system.

While this study was conducted to determine the factors affecting the influencing of student achievements in colleges of education, this present study seeks to analyse specifically the Influence of artificial intelligence on Business Education students' academic performance.

Aransi (2018) examined the impact of artificial intelligence tools on High School students' academic performance in Economics in Irewole and Isokan Local Government Areas of Osun State, Nigeria. Three research questions were formulated and answered at 5% ($\alpha = 0.05$) level of significant. The study adopted expo-facto research design which was qualitative and quantitative in nature and purposeful sampling technique to obtain six hundred and fifty-six (656) Grade 10 (SSS ONE) students from the target population of the study. Three schools were used from both Local Governments based on their unique

and similar characteristics and the secondary data with respect to artificial intelligence tools and scores in Economics were extracted from the results of Unified Promotion Examination (UPE) conducted by Osun State Ministry of Education in May, 2017. Analysis of Covariance (ANCOVA), correlation analysis and t-test statistics were used. The finding of the study indicated that there was no interactive influence of artificial intelligence tools on the academic performance in Economics. However, positive but weak linear relationship existed between AI tools and performance while there was significant difference in the academic performance of the High School students in Economics. The study recommended among others; that teachers, most especially those teaching Economics at High School levels should employ teaching methods that could accommodate the use of artificial intelligence among students. Also, that stakeholders of education should make available necessary instructional devices needed to ensure efficiency in teaching and permanency in learning Economics among High School students of different age and gender.

While this previous study focused on the impact of age and gender on High School students' academic performance in Economics in Osun State, this present study aims to focus on the influence of more artificial intelligence tools on the academic performance of students of vocational and technical education in Edo state. Empirical studies investigating the influence of AI on business education students' academic performance offer valuable insights into the practical implications of AI integration. A study conducted by Smith et al. (2020) examined the impact of an AI-driven tutoring system on

business students' performance in accounting courses. The results indicated a significant improvement in students' understanding of complex concepts and a higher rate of success in assessments compared to traditional teaching methods.

Contrastingly, challenges associated with AI integration in education have also been identified. Johnson and Smith (2018) found that some students experienced anxiety and apprehension when interacting with AI-based educational tools, expressing concerns about job displacement and the dehumanization of the learning experience. This highlights the importance of considering the socio-emotional aspects of AI integration alongside its academic benefits. Some of these negative factors are; Bias and discrimination: AI systems can sometimes perpetuate or amplify existing biases and discrimination. For example, if an AI system is trained on data that is biased in some way (e.g., if it is trained on data that reflects gender or racial stereotypes), it may make biased or discriminatory decisions.

Overreliance on technology, in some cases, the use of AI in education could lead to an overreliance on technology. This could mean that students are less likely to develop important skills like critical thinking, problem-solving, and collaboration because they are relying on technology to do the work for them.

Lack of human interaction, AI systems may not be able to replicate the value of human interaction in education. For example, a student who is struggling with a difficult

concept may benefit from having a teacher explain it to them in person, rather than relying on an AI system to provide an explanation.

Cost Implementing, AI systems in education can be expensive, and many schools and universities may not have the resources to invest in these technologies. This could lead to a widening gap between schools that can afford to use AI and those that cannot.

Privacy and security concerns, AI systems in education; may collect sensitive student data, which could be vulnerable to security breaches or misuse. This could lead to privacy violations and other potential harms. It is important to carefully consider these and the amount of knowledge gained and retained determines the quality of workers that would be produced into the world of work through Business Education.

Furthermore, ethical considerations surrounding AI use in education have been a subject of discourse. Issues such as data privacy, algorithmic bias, and the need for transparent decision-making processes pose potential obstacles to the seamless incorporation of AI into business education (Selwyn, 2019). These concerns emphasize the necessity for a well-defined ethical framework to guide the responsible deployment of AI in educational settings.

Summary of Review of Related Literature

Several studies have highlighted the positive effects of AI on learning outcomes. For instance, AI-driven adaptive learning platforms have been shown to personalize learning

experiences, catering to individual student needs and promoting a more effective learning environment (Dede, 2010; Siemens & Long, 2011). Additionally, AI tools such as chatbots, ChatGPT, Quillian, TextCortex, Google bard e.t.c and virtual assistants have demonstrated their ability to enhance student engagement and provide instant feedback, contributing to a more dynamic and interactive educational experience (Ally, 2008; Anderson & Rainie, 2010).

It was also stated that the integration of AI in business education holds immense potential to positively impact students' academic performance by providing personalized learning experiences and enhancing engagement. However, careful consideration must be given to the ethical implications and potential challenges associated with AI adoption. Future research should focus on refining AI technologies to address these concerns and on assessing the long-term impact of AI on the skills and competencies of business education graduates in the ever-evolving professional landscape.

In conclusion the study happens to fill up the gap of the influence of artificial intelligence on business education student’s academic performance, how school managements in business education can make use of artificial intelligence to their advantage in order to establish a good academic performance of their students in business education. To the achievement of that, several tools where introduced and how they can be used were also made known in this study so as to show the advantage artificial intelligence have on the academic performance of students. With the adoption of artificial intelligence, the

researcher is certain to say that it is possible to have a standardized academic performance of the students in business education, if it will be well used for the purpose in which it was integrated for.

CHAPTER THREE

RESEARCH METHOD

This chapter describes the methods and techniques used in carrying out the study under the following sub-headings:

- Research Design of the Study
- Population of the Study
- Sample and Sampling Technique
- Instrument for Data Collection
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Research Design of the Study

The study used a descriptive research design. This design was chosen because it helped to have an in-depth understanding of the influence of artificial intelligence on Business Education students' academic performance in the University of Benin, Benin City. In addition, the study relied more on qualitative than quantitative research methods.

Population of the Study

The Total population of this study consist of one hundred and twenty (120) Business Education students from 100level to 400level of the 2022/2023 set, from the Department of Vocational and Technical Education, Faculty of Education, University of Benin, Benin City.

Sample and Sampling Technique

The sample size for this study consist of 116 Business Education students from the Department of Vocational and Technical Education, the Faculty of Education, University of Benin, was purposively selected for this study as sample respondents. Twenty-two Business Education students (22) with a percentage of (19%) from 100level was used from the actual population of 42 students, Eight Business Education students (8)with a percentage of (6.9%) from 200level was used from the actual population of 40 students,

twenty-two Business Education students (22) with a percentage of (19%)from 300level was used from the actual population of 120 students, sixty-four Business Education students (64) with a percentage of (55.2%) from 400level was used from the actual population of 128 students. The total sample population is (22+8+22+64 = 116) while the total sampling population percentage is (19.0+6.9+19.0+55.2 = 100%).

Instrument of Data Collection

The research instrument used for data collection is a structured and unstructured questionnaire. The questionnaire is titled "The Influence of Artificial Intelligence on Business Education students' academic performance". The questionnaires administered to the respondents were of two sessions: A and B. Section A consists of the demographic data such as Sex, Level, Course Area and Section B covers 20 items drawn from the research questions (items concerning the research study). The Section B is divided into B1, B2, B3, B4 and B5 according to research question 1,2,3,4 & 5 respectively. A modified scale was used with the following points: Very High Extent (VHE) = 4 points; High Extent (HE) = 3 points; Low Extent (LE) = 2 points; Very Low Extent (SD) = 1 point.

Validity of the Instrument

To ensure the validity of the research instrument, it was given to the researcher's supervisor and one other person in the department of vocational and technical education to go through and make some modifications and corrections before printing, thus giving it a face and item validity.

Reliability of the Instrument

To establish the reliability of the instrument, the Cronbach Alpha Statistics was used to measure the level of the items. The instrument was administered to 20 students who are not part of the study population. A co-efficient value of 0.692 was obtained which shows that the instrument is reliable.

Method of Data Collection

The instrument was personally administered by the researcher to the respondents. The researcher introduce himself to the respondents, explain what the research is all about.

Method of Data Analysis

The questionnaire was administered and received by the researcher. The data collected will be properly organized and tabulated. The responses were statistically analyzed by the use of frequency counts, mean and standard deviation, while independent sample T-test will be used to address the research Hypothesis.

CHAPTER FOUR

PRESENTATION, INTERPRETATION AND DISCUSSION OF FINDINGS

This chapter presents, interprets and discusses the finding from the analysis of data collected for this study.

Demographic Information of Respondents

Table 1: Frequencies and Percentages of Respondents by Gender, Age, Class, Religion, Ethnicity and Marriage Type

	Frequency	Percent
Gender		
Male	58	50.0
Female	58	50.0
Total	116	100.0
Class		

100 Level	22	19.0
200 Level	8	6.9
300 Level	22	19.0
400 Level	64	55.2
Total	116	100.0

Source: Field Survey (2024)

Table 1 shows the demographic information of participants who participated in the filling of questionnaire. The total number of 116 students participated in the filling of the questionnaire. The frequency of 58 male students with a percentage of 50% and with the frequency of 58 Female with a percentage of 50% this shows a striking balance in the demographic information of Gender. Students from 100 level which resulted into having a percentage of 19% participated, 200 level participated with a percentage of 6.9%, 300 level participated with a percentage of 19%, and 400level participated with a percentage of 55.2%.

Answers to Research Questions

Research Question 1

What are the prevalent Generative Artificial Intelligence tools used by Business Education students in University of Benin?

Table 2: Mean and Standard Deviation of the Prevalent Generative Artificial Intelligence Tools used by Business Education Students in University of Benin

SN	Items	$\overline{x}$	SD	Ranking
1	ChatGPT	3.22	1.485	1st
2	Grammarly	1.25	1.565	3rd
3	Gemini	1.38	1.608	2nd
4	TutorMe	1.06	1.464	4th
5	Quillbot	1.05	1.413	5th

Source: Field Survey (2024)

Note: $\overline{x}$ = mean, SD = Standard deviation

Table 2 indicates that CHATGPT is commonly used by Business Education students in University of Benin ($\overline{x}$ = 3.22). Gemini, Grammarly, TutorMe and Quillbot followed in a descending order with mean values of 1.38, 1.25, 1.06 and 1.05 respectively. The details of the extent to which the GAI tools are used among the students are presented in Table 3.

Table 3: Percentages of Prevalent Generative Artificial Intelligence Tools used by Business Education Students in University of Benin

	ChatGPT	Gemini	Grammarly	TutorMe	Quillbot
No response	16.4	52.6	57.8	60.3	59.5
Very Low Extent	0.9	5.2	1.7	5.2	4.3
Low Extent	0.0	9.5	10.3	13.8	16.4
High Extent	10.3	17.2	18.1	9.5	11.2
Very High Extent	72.4	15.5	12.1	11.2	8.6

Total	100.0	100.0	100.0	100.0	100.0

Source: Field Survey (2024)

Table 3 reveals that 72.4% of the respondents who provided valid responses claimed to use ChatGPT to a very high extent, compared to 15.5% who used Gemini at the same extent. Less than 1% use ChatGPT to a low or a very low extent. Some other Generative Artificial Intelligence tools listed by the respondents are:

1. IBM Watson
2. Open NN
3. Mid Journey
4. Copy scape
5. GitHub
6. Microsoft Azure
7. Chat PDF
8. AI business tools
9. Sales Force.

Research Question 2

What aspects of Business Education where Generative Artificial Intelligence tools are prevalently used?

Table 4: Mean and Standard Deviation of the Aspects of Business Education where Generative Artificial Intelligence Tools are Prevalently Used

SN	Items	$\overline{x}$	SD	Ranking
1	Accounting	2.93	1.559	1st
2	Marketing	1.82	1.661	2nd
3	OTM	1.33	1.587	3rd

Source: Field Survey (2024)

Note: $\overline{x}$ = mean, SD = Standard deviation

Table 4 indicates that aspects of Business Education where Generative Artificial Intelligence Tools are prevalently used. The conclusion states that Generative AI Tools are most prevalently used in the Accounting aspect of Business Education ($\overline{x}$ = 2.93), followed by Marketing aspect ($\overline{x}$ = 1.82) and OTM aspect ($\overline{x}$ = 1.33). The details of the extent to which the GAI tools are used among the students are presented in Table 5.

Table 5: Percentages of the Aspects of Business Education where Generative Artificial Intelligence Tools are Prevalently Used

	Accounting	Marketing	OTM
No response	19.8	41.4	52.6
Very Low Extent	0.0	3.4	6.9
Low Extent	5.2	6.9	12.1

High Extent	17.2	28.4	12.1
Very High Extent	57.8	19.8	16.4
Total	100.0	100.0	100.0

Source: Field Survey (2024)

Table 5 reveals that 57.8% of the respondents who provided valid responses claimed to use Generative AI tools in Accounting to a very high extent, compared to 19.8% and 16.4% who used the tools in Marketing and OTM aspects at the same extent.

Research Question 3

What are the positive influences of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?

Table 6: Mean and Standard Deviation of the Positive Influences of Generative Artificial Intelligence on the Learning of Business Education Students of University of Benin

SN	Items	$\overline{x}$	SD	Decision
ChatGPT				

1	ChatGPT can enhance Business Education student's academic writing.	3.57	0.737	Influenced
2	The existing ChatGPT can personalize the learning experience in Business Education.	3.33	0.720	Influenced
3	ChatGPT can help in transforming the traditional classroom setting in Business Education.	3.32	0.851	Influenced
4	ChatGPT can help to develop Business Education skills.	3.41	0.791	Influenced
	Cluster Value	3.41	0.621	Influenced
Grammarly				
1	Grammarly can help build the critical thinking level of Business Education students.	3.39	0.682	Influenced
2	Grammarly can help Business Education students to be captivated and interested in the teaching and learning process.	3.22	0.792	Influenced
3	Grammarly can help Business Education to reduce academic workloads and stress of Business Education students.	3.33	0.670	Influenced
4	Grammarly can help to build Business Education students vocabulary and grammatical correctness.	3.60	0.558	Influenced

	Cluster Value	3.39	0.471	Influenced
Gemini				
1	Gemini can aid Business Education students in grasping new and difficult concepts, honing skills and receiving valuable feedback.	3.56	0.564	Influenced
2	Gemini can create interactive and engaging learning environments for Business Education students.	3.30	0.701	Influenced
3	Gemini can help Business Education students to create creative content for their academic research.	3.52	0.679	Influenced
	Cluster Value	3.46	0.508	Influenced
TutorMe				
1	TutorMe can enhance creativity, critical thinking skills and confidence in Business Education students.	3.52	0.679	Influenced
2	TutorMe can provide accurate and fair assessment of Business Education student's academic performance.	3.53	0.678	Influenced
	Cluster Value	3.52	0.553	Influenced

Source: Field Survey (2024)

Note: $\overline{x}$ = mean, SD = Standard deviation

Table 6 shows the positive influences of four different Generative Artificial Intelligence tools on the learning of Business Education students of University of Benin. The respondents agreed that ChatGPT can enhance Business Education students academic writing ($\overline{x}$ = 3.57), personalize the learning experience ($\overline{x}$ = 3.33), help in transforming the traditional classroom setting ($\overline{x}$ = 3.32), and help to develop Business

Education skills ($\overline{x}$ = 3.41). Grammarly can help build the critical thinking level of Business Education students ($\overline{x}$ = 3.39), help Business Education students to be captivated and interested in the teaching and learning process ($\overline{x}$ = 3.22), reduce academic workloads and stress of Business Education students ($\overline{x}$ = 3.33), and help to build Business Education students vocabulary and grammatical correctness ($\overline{x}$ = 3.60). Gemini can aid Business Education students in grasping new and difficult concepts, honing skills and receiving valuable feedback ($\overline{x}$ = 3.56), create interactive and engaging learning environments for Business Education students ($\overline{x}$ = 3.30), and help Business Education students to create creative content for their academic research ($\overline{x}$ = 3.52). TutorMe can enhance creativity, critical thinking skills and confidence in Business Education students ($\overline{x}$ = 3.52), and can provide accurate and fair assessment of Business Education student's academic performance ($\overline{x}$ = 3.53).

Research Question 4

What are the negative influences of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?

Table 7: Mean and Standard Deviation of the Negative Influences of Generative Artificial Intelligence on the Learning of Business Education Students of University of Benin

SN	Items	$\overline{x}$	SD	Decision
1	Generative Artificial Intelligence can increase exam	3.74	0.478	High Extent

	malpractices.			
2	Generative Artificial Intelligence can create room for laziness.	3.66	0.529	High Extent
3	Generative Artificial Intelligence can bring about lack of originality.	3.53	0.739	High Extent
4	Generative Artificial Intelligence can create overdependence on technology.	3.74	0.513	High Extent
5	Generative Artificial Intelligence can reduce the level of Business Education student's classroom attendance.	3.29	0.834	High Extent
6	Generative Artificial Intelligence can develop Erosion of Human Creativity.	3.27	0.848	High Extent
	Cluster Value	**3.54**	**0.447**	**High Extent**

Source: Field Survey (2024)

Note: $\overline{x}$ = mean, SD = Standard deviation

Table 7 shows that the Generative Artificial Intelligence can also have a negative influence on the learning of Business Education Students of University of Benin. Generative Artificial Intelligence can increase exam malpractices ($\overline{x}$ = 3.74), create room for laziness ($\overline{x}$ = 3.66), bring about lack of originality ($\overline{x}$ = 3.53), can create overdependence on technology ($\overline{x}$ = 3.74), reduce the level of Business Education student's classroom attendance ($\overline{x}$ = 3.29), and develop erosion of human creativity ($\overline{x}$ = 3.27).

Research Question 5:

What are the factors mitigating against the use of Generative Artificial Intelligence in the learning of Business Education students of University of Benin?

Table 8: Mean and Standard Deviation of the Negative Influences of Generative Artificial Intelligence on the Learning of Business Education Students of University of Benin

SN	Items	$\overline{x}$	SD	Decision
1	Electricity can mitigate against the use of GAI in learning process.	3.50	0.653	High Extent
2	Availability of gadgets such as pc, mobile phones can mitigate against the use of GAI in learning process	3.31	0.817	High Extent
3	Mobile network and data can mitigate the use of GAI in learning process.	3.71	0.560	High Extent
4	Subscription to use premium services can mitigate the use of GAI in learning process.	3.46	0.739	High Extent
5	Lack of regulation can mitigate the use of GAI in learning process.	3.28	0.778	High Extent
6	Technical know-how can mitigate the use of GAI in learning process.	3.41	0.723	High Extent
	Cluster Value	**3.45**	**0.500**	**High Extent**

Source: Field Survey (2024)

Note: $\overline{x}$ = mean, SD = Standard deviation

Table 8 shows that the factors listed in the questionnaire are mitigating against the use of Generative Artificial Intelligence in the learning of Business Education Students of University of Benin. They agreed that electricity can mitigate against the use of GAI in learning process ($\overline{x}$ = 3.50), availability of gadgets ($\overline{x}$ = 3.31), mobile network and data ($\overline{x}$ = 3.71), subscription to use premium services ($\overline{x}$ = 3.46), lack of regulation ($\overline{x}$ = 3.28), poor technical know-how ($\overline{x}$ = 3.41) can mitigate against the use of GAI in learning process.

Data Analysis for Testing the Hypotheses

Research Hypothesis 1

There is no significant difference in the positive influences of Generative Artificial Intelligence on the learning of Business Education between male and female students of University of Benin.

Table 9: Independent Samples t-test of the Difference in the Positive Influences of Generative Artificial Intelligence on the Learning of Business Education between Male and Female Students of University of Benin

Variables	N	$\overline{x}$	SD	T	df	P	Decision
ChatGPT							
Male	58	3.62	0.566				Significant
Female	58	3.19	0.605	3.881	114	0.00	
Grammarly							
Male	58	3.50	0.515				Significant
Female	58	3.27	0.395	2.679	107	0.01	
Gemini							
Male	58	3.63	0.502				Significant
Female	58	3.29	0.457	3.863	114	0.00	
TutorMe							
Male	58	3.68	0.426				Significant
Female	58	3.36	0.620	3.230	101	0.00	

Source: Field Survey (2024)

Keys: r = correlation coefficient, df = degree of freedom, **ρ** = probability value of significance, α = alpha value of significance (0.05)

Table 9 indicates that since all the obtained ρ-values are less than the alpha level of 0.05, the positive influence of the four Generative AI tools are significantly different between male and female students. In every case, the influence was higher among male students than female students. Hence, the null hypothesis is not retained.

Research Hypothesis 2

There is no significant difference in the negative influences of Generative Artificial Intelligence on the learning of Business Education between male and female students of University of Benin.

Table 10: Independent Samples t-test of the Difference in the Negative Influences of Generative Artificial Intelligence on the Learning of Business Education between Male and Female Students of University of Benin

Variables	N	$\overline{x}$	SD	t	df	ρ	Decision
Male	58	3.67	0.450				
Female	58	3.41	0.405	3.362	114	0.00	Significant

Source: Field Survey (2024)

Keys: r = correlation coefficient, df = degree of freedom, **ρ** = probability value of significance, α = alpha value of significance (0.05)

Table 10 indicates that since the obtained ρ-value is less than the alpha level of 0.05, the negative influence of the Generative AI tools is significantly different between male and

female students. Specifically, the influence was higher among male students than female students. Hence, the null hypothesis is not retained.

Research Hypothesis 3

There is no significant difference in the factors mitigating against the use of Generative Artificial Intelligence in the learning of Business Education between male and female students of University of Benin.

Table 11: Independent Samples t-test of the Difference in the Factors Mitigating against the Use of Generative Artificial Intelligence on the Learning of Business Education between Male and Female Students of University of Benin

Variables	N	$\overline{x}$	SD	t	df	ρ	Decision
Male	58	3.69	0.446				Significant
Female	58	3.20	0.432	5.917	114	0.00	

Source: Field Survey (2024)

Keys: r = correlation coefficient, df = degree of freedom, **ρ** = probability value of significance, α = alpha value of significance (0.05)

Table 11 indicates that since the obtained ρ-value is less than the alpha level of 0.05, the factors mitigating against the use of Generative AI tools is significantly different between male and female students. Specifically, the perception of the factors was higher among male students than female students. Hence, the null hypothesis is not retained.

Discussion of Findings

The findings of this study were discussed with respect to the research questions earlier raised in the study.

From research question one, the findings of this study revealed that ChatGPT one of the prevalent Generative Artificial Intelligence ranked First (1st), the result shows that CHATGPT is commonly used by Business Education students in University of Benin. CHATGPT ranked 1st with a mean of 3.22 and SD of 1.485, Gemini ranked 2nd with a mean of 1.38 and SD of 1.608, Grammarly ranked 3rd with a mean of 1.25 and SD of 1.565, TutorMe ranked 4th with a mean of 1.06 and SD of 1.464 while Quillbot ranked 5th with a mean of 1.05 and SD of 1.413. This shows that Business Education students in University of Benin used ChatGPT and Gemini more for the improvement of their academic performance. Question 1b shows some other Generative Artificial Intelligence Tools which were commonly listed by the respondents and that shows that they are familiar with other artificial Intelligence tools which are: IBM Watson, Open NN, and Mid Journey, Copy scape, GitHub, Microsoft Azure, Chat PDF, AI business tools, Sales Force. Aligning with the findings of Ally,2008; Anderson & Rainier, 2010 whose study concluded that the AI tools demonstrate their ability to enhance student engagement and provide instant feedback, contribution to a more dynamic and interactive educational experience which enable Business Education Students to be able to improve their academic performance.

From research question two the study reveals that the prevalent Generative artificial intelligence are highly used by accounting students in Business Education which ranked First (1st) followed by Marketing students in Business Education which ranked second (2nd). Accounting ranked 1st with a mean of 2.93 and SD of 1.559, marketing ranked 2nd with a mean of 1.82 and SD of 1.661, OTM ranked third with a mean of 1.33 and SD of 1.587. The result shows that Accounting students make use of the Prevalent Generative Artificial Intelligence to improve their academic performance. While marketing students also make use of prevalent Generative Artificial Intelligence tools to also improve their academic performance. Aligning with the findings of Alrakhawi, Jamiat, and Abu-Naser, (2023) whose study concluded that artificial intelligence enhances self-assurance and academic achievement among Accounting and marketing students in Business Education. According to a study conducted by Smith et al, 2020 who examined the impact of an AI-driven tutoring system on business students' performance in accounting courses. The results indicated a significant improvement in students' understanding of complex concepts and a higher rate of success in assessments compared to traditional teaching methods.

From research question three, the study reveals the positive influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin. It was proven according to respondents that the Prevalent Generative Artificial Intelligence has positively influence learning because they all ranked with High Extent. It shows that artificial intelligence on the learning of Business Education students of

university of Benin has helped in improving their academic performance and learning skills. It means artificial intelligence has a positive influence on the learning of Business Education students. Aligning with the findings of Dede, 2010; Siemens & Long, 2011 whose study concluded that artificial intelligence tools has positive impact on learning outcomes of students in Business Education and Aransi 2018 whose study concluded that artificial intelligence has a positive influence on the learning of students.

Research question four investigated the negative influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin. It was evident that Generative Artificial Intelligence can increase Exam malpractices, Generative Artificial Intelligence can create room for laziness, Generative Artificial Intelligence can bring about lack of originality, Generative Artificial Intelligence can create over dependence on technology, Generative Artificial Intelligence can reduce the level of Business Education Student's classroom attendance, and Generative Artificial Intelligence can develop Erosion of Human Creativity. According to this it shows that Generative Artificial Intelligence has its own share of negative side affecting Business Education students learning. Aligning with the findings of Johnson and Smith, 2018 whose study concluded that some students experience anxiety and apprehension when interacting with AI-based educational tools, expressing concerns about job displacement and the dehumanization of the learning experience. This highlights the importance of considering the socio-emotional aspects of AI integration alongside its academic benefits.

Lastly, Research question five investigated the factors mitigating against the use of Generative Artificial Intelligence in the learning of Business Education students of University of Benin. It was evident that electricity, mobile network, subscription of premium services, lack of regulation and technical know-how can mitigate the use of GAI in learning process. Aligning with the findings of B.K. Baradwaj and S. Pal, from Purvanchal University, Uttar Pradesh and Baradwaj and Pal, 2021 who explored the various factors mitigating against the use of Generative Artificial Intelligence. Two professors, R.R. kabra and R.S. Bichkar from S.G.R college of Engineering and Management, Maharashtra, conducted research (Kabra & Bichkar, 2021) on students at the same college and discovered that many personal factors also plays an important role in a student's academic performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The purpose of this research was to investigate the influence of generative artificial intelligence on the academic performance of business education students in University of Benin. The sample size for this study consist of 116 Business Education students from the Department of Vocational and Technical Education, Faculty of Education, University of Benin, was purposively selected for this study as sample respondents. Twenty-two Business Education students (22) with a percentage of (19%) from 100level was used from the actual population of 42 students, Eight Business Education students (8)with a percentage of (6.9%) from 200level was used from the actual population of 40 students, twenty-two Business Education students (22) with a percentage of (19%)from 300level was used from the actual population of 120 students, sixty-four Business Education students (64) with a percentage of (55.2%) from 400level was used from the actual population of 128 students. The total sample population is (22+8+22+64 = 116) while the total sampling population percentage is (19.0+6.9+19.0+55.2 = 100%).

Five research questions were raised to guide the study and three hypotheses was formulated and tested at 0.05 level of significance. The reliability was determined using 20 respondents who were not part of the study population. However, Alpha Value of 0.89 was obtained. The data collected were analyzed using mean (X) and standard deviation.

The researcher made effort in analyzing, determine the kind of generative artificial intelligence students are exposed to, the researcher also ensure that an open ended option in the questionnaire is given to the respondents for the sake of sharing their thoughts on some other kind of generative artificial intelligence which was not mentioned in the research questionnaire one by the researcher. There was a general conclusion to some other common types of generative artificial intelligence that is geared towards academic learning and improvement of student's academic performance.

The researcher also made effort to determine the course area in business education where artificial intelligence is used, the positive influence of artificial intelligence on business education in university of Benin, the negative influence of artificial intelligence on business education in university of Benin and the factors mitigating against the use of Generative Artificial Intelligence were also put in check by the researcher as well. All of which have been discussed in details under the review of literature.

The collection of data was carried out through the administration of questionnaire to one hundred and Sixteen (116) undergraduate students from Business Education in University of Benin, Benin City. The data were interpreted and discussed using, Mean, standard deviation, percentages and frequency table. The sampling techniques used for the research is the stratified random.

Conclusion

In conclusion, this study has shed light on the current state of student's exposure and experiences with artificial intelligence in the realm of education in improving business education student's academic performance. The findings underscore the awareness of business education students on various generative artificial intelligence and how it is been used to improve their academic performance.

Furthermore, it has become evident that AI has a substantial impact on various facets of business education students learning, including access to learning materials, customization of learning experiences, collaboration, instant feedback, and the development of critical thinking and problem-solving skills. The incorporation of AI in education has yielded numerous benefits, including improved educational quality, broader access to resources, enhance convenience, and overall better educational outcomes.

Nonetheless, the study also identified some key challenges, such as laziness, lack of originality, examination malpractice, overdependence on technology, ability to reduce classroom attendance and developing Erosion on human creativity. Importantly, the study found out that there are some factors that are mitigate against the use of artificial intelligence in the learning of business education students of University of Benin such as, electricity, mobile data, and subscription to use premium service, lack of regulation and technical know-how. This research underscores the potential of generative AI in

education and highlights areas for improvement in addressing the challenges that arise with its implementation.

Recommendations

Based on the conclusion of the study, the following recommendations are made;

- Authorities in Business Education department should recognize the challenges associated with the integration of AI in Business Education, Business Education department should invest in technical support and provision of materials needed for administering generative AI to business education students.
- Educators in business education department should receive trainings to adapt to new AI-based teaching methods, and a balance should be struck between traditional teaching and AI-based methods to ease the transition.
- Inclusive Approach: To bridge the digital divide and ensure that all students in business education can benefit from AI in education in order to improve their academic performance, Business Education department should adopt a more inclusive approach. This could involve providing access to necessary technology and resources for students who might be at a disadvantage due to socioeconomic factors, thus creating a more equitable educational environment.
- To harness the full potential of generative AI among business education students, Business Education department should focus on creating more customized learning platforms and environments. This involves developing AI-driven tools and platforms

that cater to individual learning needs and preferences, ultimately a more personalized and effective learning experience for each student in business education.

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APPENDIX A

DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION

FACULTY OF EDUCATION

UNIVERSITY OF BENIN

BENIN CITY

Dear sir/Ma,

REQUEST FOR YOUR ASSISTANCE IN FILLING THIS QUESTIONNAIRE

I am **KENNETH WISDOM ONYEBUCHI** with a Matriculation Number **EDU1904737**, an undergraduate student in the Department of Vocational and Technical Education, Faculty of Education, University of Benin and currently carrying out a research on **"The influence of Generative Artificial Intelligent on Business Education Students Academic Performance in University of Benin, Benin city, Edo state".**

This questionnaire is designed for an academic purpose and I would be very grateful if you in your honest opinion provide answers to the following questions.

Please note that any information provided shall be treated with utmost confidentiality. Thank you in appreciation of your sincere and genuine reactions to the questions.

Yours Faithfully,

KENNETH Wisdom Onyebuchi,

Researcher.

APPENDIX B

Instruction: Please read each question item properly and indicate your answer by ticking [√] in the column that matches your opinion.

Section A: Demographic Data

Sex: Male [ ], Female [ ]

Level: 100 level [ ], 200 level [ ], 300 level [ ], 400 level [ ]

Course Area: Business Education

Section B:

Very High Extent [VHE]: 4

High Extent [HE]: 3

Low Extent [LE]: 2

Very Low Extent [VLE]: 1

S/N	QUESTIONS	VHE	HE	LE	VLE

Q1	**What are the prevalent Generative Artificial Intelligence used by Business Education students in University of Benin?**				
1	ChatGPT				
2	Grammarly				
3	Google Bard (Gemini)				
4	TutorMe				
5	Quillbot				
i ii iii iv v vi vii viii ix x	**LIST 10 GENERATIVE ARTIFICIAL INTELLIGENCE THAT YOU KNOW:**				
Q2	**What aspects of Business Education where Generative Artificial Intelligence are prevalently used?**	**VHE**	**HE**	**LE**	**VLE**
6	Accounting				
7	Marketing				
8	OTM				

Q3	**What are the positive influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?**				
	CHATGPT	**VHE**	**HE**	**LE**	**VLE**
i	ChatGPT can enhance Business Education student's academic writing.				
ii	The existing ChatGPT can personalize the learning experience in Business Education.				
iii	ChatGPT can help in transforming the traditional classroom setting in Business Education.				
iv	ChatGPT can help to develop Business Education skills.				
	GRAMMARLY	**VHE**	**HE**	**LE**	**VLE**
i	Grammarly can help build the critical thinking level of Business Education students.				
ii	Grammarly can help Business Education students to be captivated and interested in the teaching and learning process.				
iii	Grammarly can help Business Education to reduce academic workloads and stress of Business Education students.				
iv	Grammarly can help to build Business Education students vocabulary and grammatical correctness.				

	GOOGLE BARD (GEMINI)	VHE	HE	LE	VLE
i	Gemini can aid Business Education students in grasping new and difficult concepts, honing skills and receiving valuable feedback.				
ii	Gemini can create interactive and engaging learning environments for Business Education students.				
iii	Gemini can help Business Education students to create creative content for their academic research.				
	TUTORME	**VHE**	**HE**	**LE**	**VLE**
i	TutorMe can enhance creativity, critical thinking skills and confidence in Business Education students.				
ii	TutorMe can provide accurate and fair assessment of Business Education student's academic performance.				
Q4	**What are the negative influence of Generative Artificial Intelligence on the learning of Business Education students of University of Benin?**	**VHE**	**HE**	**LE**	**VLE**
9	Generative Artificial Intelligence can increase exam malpractices.				
10	Generative Artificial Intelligence can create room for laziness.				
11	Generative Artificial Intelligence can bring				

	about lack of originality.				
12	Generative Artificial Intelligence can create overdependence on technology.				
13	Generative Artificial Intelligence can reduce the level of Business Education student's classroom attendance.				
14	Generative Artificial Intelligence can develop Erosion of Human Creativity.				
Q5	**What are the factors mitigating against the use of Generative Artificial Intelligence (GAI) in the learning of Business Education students of University of Benin?**	**VHE**	**HE**	**LE**	**VLE**
15	Electricity can mitigate against the use of GAI in learning process.				
16	Availability of gadgets such as pc, mobile phones can mitigate against the use of GAI in learning process				
17	Mobile network and data can mitigate the use of GAI in learning process.				
18	Subscription to use premium services can mitigate the use of GAI in learning process.				
19	Lack of regulation can mitigate the use of GAI in learning process.				
20	Technical know-how can mitigate the use of GAI in learning process.				

APPENDIX C

Frequencies

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```
FREQUENCIES VARIABLES=Sex Level ChatGPT Grammarly Gemini TutorMe
Quillbot Accounting Marketing OTM
  /PIECHART FREQ
  /ORDER=ANALYSIS.
```

Frequency Table

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	50.0	50.0	50.0
	Female	58	50.0	50.0	100.0
	Total	116	100.0	100.0	

APPENDIX D

Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	300 Level	22	19.0	19.0	19.0
	200 Level	8	6.9	6.9	25.9
	100 Level	22	19.0	19.0	44.8
	400 Level	64	55.2	55.2	100.0
	Total	116	100.0	100.0	

APPENDIX E

ChatGPT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No response	19	16.4	16.4	16.4
	Very Low Extent	1	.9	.9	17.2
	High Extent	12	10.3	10.3	27.6
	Very High Extent	84	72.4	72.4	100.0
	Total	116	100.0	100.0	

Grammarly

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No response	67	57.8	57.8	57.8
	Very Low Extent	2	1.7	1.7	59.5
	Low Extent	12	10.3	10.3	69.8
	High Extent	21	18.1	18.1	87.9
	Very High Extent	14	12.1	12.1	100.0
	Total	116	100.0	100.0	

Gemini

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No response	61	52.6	52.6	52.6
	Very Low Extent	6	5.2	5.2	57.8
	Low Extent	11	9.5	9.5	67.2
	High Extent	20	17.2	17.2	84.5
	Very High Extent	18	15.5	15.5	100.0
	Total	116	100.0	100.0	

TutorMe

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No response	70	60.3	60.3	60.3
	Very Low Extent	6	5.2	5.2	65.5
	Low Extent	16	13.8	13.8	79.3
	High Extent	11	9.5	9.5	88.8
	Very High Extent	13	11.2	11.2	100.0
	Total	116	100.0	100.0	

Quillbot

		Frequency	Percent	Valid Percent	Cumulative Percent
Vali	No response	69	59.5	59.5	59.5
	Very Low	5	4.3	4.3	63.8

d	Extent				
	Low Extent	19	16.4	16.4	80.2
	High Extent	13	11.2	11.2	91.4
	Very High Extent	10	8.6	8.6	100.0
	Total	116	100.0	100.0	

Accounting

		Frequency	Percent	Valid Percent	Cumulative Percent
	No response	23	19.8	19.8	19.8
	Low Extent	6	5.2	5.2	25.0
Valid	High Extent	20	17.2	17.2	42.2
	Very High Extent	67	57.8	57.8	100.0
	Total	116	100.0	100.0	

Marketing

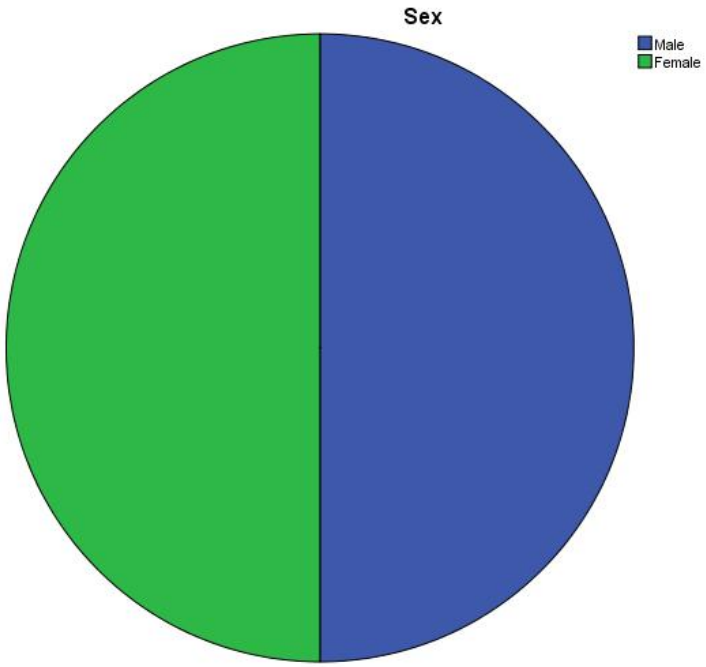
		Frequency	Percent	Valid Percent	Cumulative Percent
Vali	No response	48	41.4	41.4	41.4

d	Very Low Extent	4	3.4	3.4	44.8
	Low Extent	8	6.9	6.9	51.7
	High Extent	33	28.4	28.4	80.2
	Very High Extent	23	19.8	19.8	100.0
	Total	116	100.0	100.0	

OTM

		Frequency	Percent	Valid Percent	Cumulative Percent
	No response	61	52.6	52.6	52.6
	Very Low Extent	8	6.9	6.9	59.5
Valid	Low Extent	14	12.1	12.1	71.6
	High Extent	14	12.1	12.1	83.6
	Very High Extent	19	16.4	16.4	100.0
	Total	116	100.0	100.0	

Pie Charts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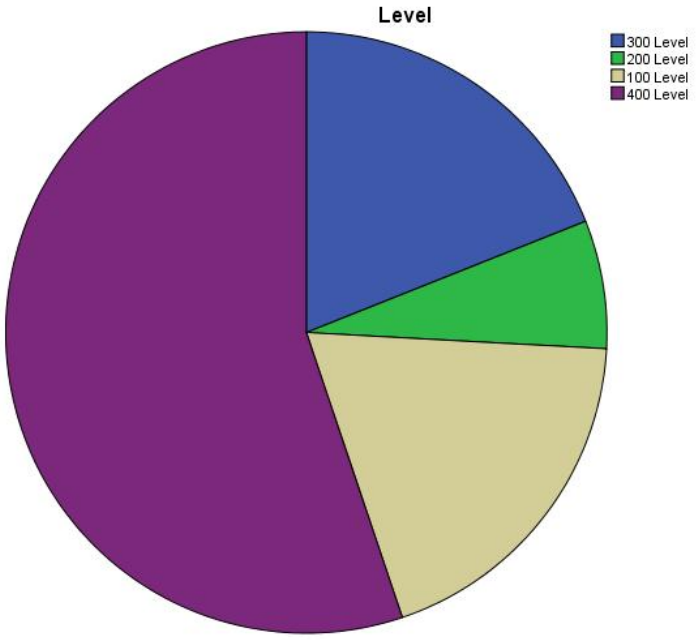
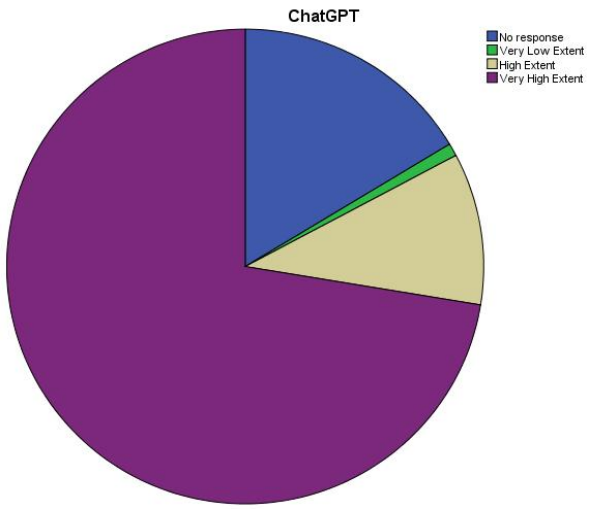
Female


Level
300 Level
200 Level
100 Level
400 Level


ChatGPT
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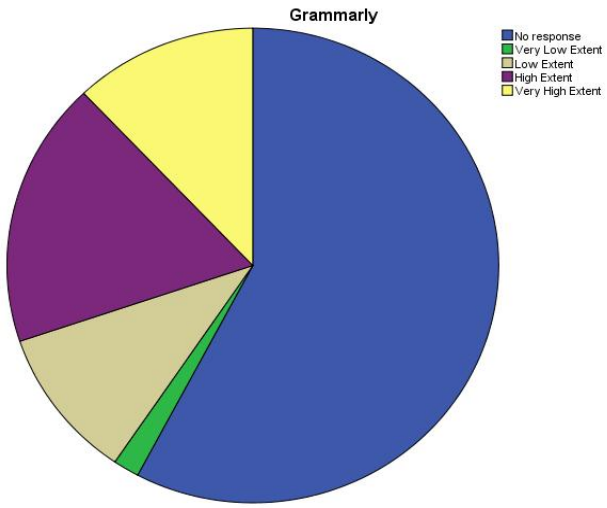
High Extent
Very High Extent


Grammarly
No response
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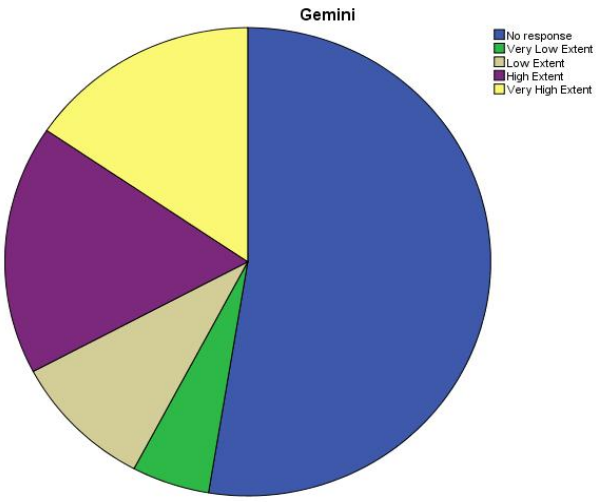
High Extent
Very High Extent


Gemini
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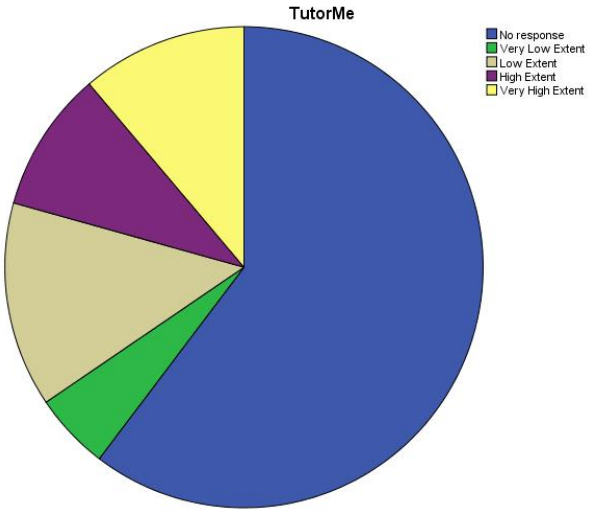
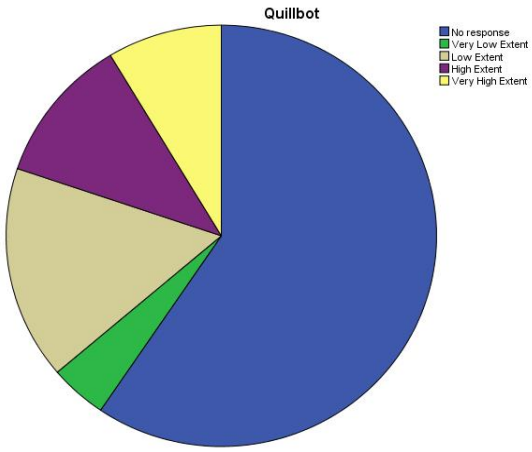
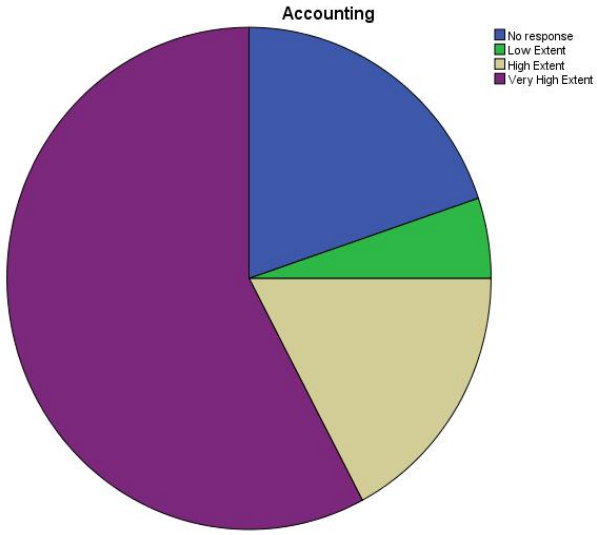
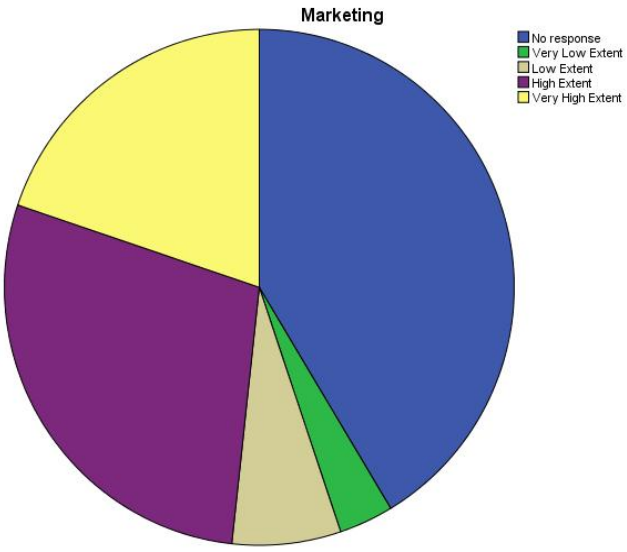
Low Extent
High Extent
Very High Extent


TutorMe
No response
Very Low Extent
Low Extent
High Extent
Very High Extent


Quillbot
No response
Very Low Extent
Low Extent
High Extent
Very High Extent


Accounting
No response
Low Extent
High Extent
Very High Extent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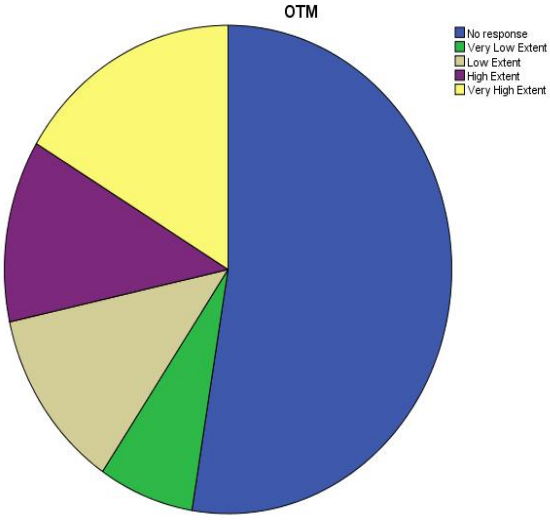
High Extent
Very High Extent


OTM
No response
Very Low Extent
Low Extent
High Extent
Very High Extent

Descriptives

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```
DESCRIPTIVES VARIABLES=ChatGPT1 ChatGPT2 ChatGPT3 ChatGPT4
ChatGPT_T Grammarly1 Grammarly2 Grammarly3 Grammarly4 Grammarly_T
Gemini1 Gemini2 Gemini3 Gemini_T TutorMe1 TutorMe2 TutorMe_T Negative9
Negative10 Negative11 Negative12 Negative13 Negative14
Negative_T Factor15 Factor16 Factor17 Factor18 Factor19 Factor20 Factors_T
 /STATISTICS=MEAN STDDEV MIN MAX KURTOSIS SKEWNESS.
```

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ChatGPT1	116	1.00	4.00	3.5690	.73690	-1.768	.225	2.653	.446
ChatGPT2	116	2.00	4.00	3.3276	.71961	-.584	.225	-.874	.446
ChatGPT3	116	1.00	4.00	3.3190	.85057	-1.01	.225	.085	.446

ChatGPT4	116	1.00	4.00	3.4052	.79102	-1.290	.225	1.178	.446
ChatGPT_T	116	1.50	4.00	3.4052	.62088	-1.001	.225	.582	.446
Grammarly1	116	1.00	4.00	3.3879	.68234	-1.005	.225	1.147	.446
Grammarly2	116	1.00	4.00	3.2241	.79220	-.851	.225	.336	.446
Grammarly3	116	2.00	4.00	3.3276	.66953	-.494	.225	-.736	.446
Grammarly4	116	2.00	4.00	3.6034	.55762	-1.032	.225	.076	.446
Grammarly_T	116	2.25	4.00	3.3858	.47134	-.068	.225	-1.043	.446
Gemini1	116	2.00	4.00	3.5603	.56397	-.833	.225	-.315	.446
Gemini2	116	1.00	4.00	3.3017	.70056	-.650	.225	-.124	.446
Gemini3	116	1.00	4.00	3.5172	.67865	-1.252	.225	.989	.446

Gemini_T	116	2.00	4.00	3.4603	.50818	-.619	.225	-.425	.446
TutorMe1	116	1.00	4.00	3.5172	.67865	-1.422	.225	2.043	.446
TutorMe2	116	2.00	4.00	3.5259	.67838	-1.116	.225	-.004	.446
TutorMe_T	116	1.50	4.00	3.5216	.55322	-1.301	.225	1.870	.446
Negative9	116	2.00	4.00	3.7414	.47769	-1.594	.225	1.607	.446
Negative10	116	2.00	4.00	3.6552	.52921	-1.190	.225	.412	.446
Negative11	116	1.00	4.00	3.5345	.73934	-1.500	.225	1.496	.446
Negative12	116	2.00	4.00	3.7414	.51280	-1.872	.225	2.727	.446
Negative13	116	1.00	4.00	3.2931	.83424	-.873	.225	-.223	.446
Negative14	116	1.00	4.00	3.2672	.84810	-.980	.225	.234	.446

Negative_T	116	2.17	4.00	3.5393	.44678	-.892	.225	.343	.446
Factor15	116	1.00	4.00	3.5000	.65275	-1.145	.225	1.020	.446
Factor16	116	1.00	4.00	3.3103	.81735	-1.118	.225	.783	.446
Factor17	116	2.00	4.00	3.7069	.55977	-1.785	.225	2.246	.446
Factor18	116	1.00	4.00	3.4569	.73889	-1.363	.225	1.618	.446
Factor19	116	1.00	4.00	3.2845	.77802	-.885	.225	.271	.446
Factor20	116	1.00	4.00	3.4138	.72314	-.956	.225	.085	.446
Factors_T	116	2.17	4.00	3.4454	.49998	-.552	.225	-.685	.446
Valid N (listwise)	116								

APPENDIX F

T-Test

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```
T-TEST GROUPS=Sex(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=ChatGPT_T Grammarly_T Gemini_T TutorMe_T Negative_T Factors_T
  /CRITERIA=CI(.95).
```

Group Statistics

	Sex	N	Mean	Std. Deviation	Std. Error Mean
ChatGPT_T	Male	58	3.6164	.56626	.07435
	Female	58	3.1940	.60525	.07947
Grammarly_T	Male	58	3.5000	.51512	.06764
	Female	58	3.2716	.39538	.05192
Gemini_T	Male	58	3.6324	.50206	.06592
	Female	58	3.2881	.45678	.05998
TutorMe_T	Male	58	3.6810	.42610	.05595

	Female	58	3.3621	.61980	.08138
	Male	58	3.6729	.44997	.05908
Negative_T	Female	58	3.4057	.40487	.05316
	Male	58	3.6867	.44610	.05858
Factors_T	Female	58	3.2041	.43225	.05676

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tail	Mean Difference	Std. Error Difference	95% Confidence Interval of the

						ed)			Difference	
									Lower	Upper
ChatGPT_T	Equal variances assumed	.051	.822	3.881	114	.000	.42241	.10883	.20682	.63801
	Equal variances not assumed			3.881	113.498	.000	.42241	.10883	.20681	.63802
Grammarly_T	Equal variances assumed	15.054	.000	2.679	114	.008	.22845	.08527	.05954	.39736
	Equal variances not assumed			2.679	106.857	.009	.22845	.08527	.05942	.39748
Gemini_T	Equal variances	1.058	.30	3.86	114	.000	.34431	.08913	.1677	.52087

	assumed		6	3					5	
	Equal variances not assumed			3.863	112.996	.000	.34431	.08913	.16774	.52088
	Equal variances assumed	6.707	.011	3.230	114	.002	.31897	.09876	.12332	.51461
TutorMe_T	Equal variances not assumed			3.230	101.042	.002	.31897	.09876	.12305	.51488
	Equal variances assumed	1.339	.250	3.362	114	.001	.26724	.07948	.10979	.42469
Negative_T	Equal variances not assumed			3.362	112.751	.001	.26724	.07948	.10977	.42471
Factors	Equal	.035	.8	5.	114	.00	.4825	.08156	.32	.6441

_T	variances assumed		52	917		0	9		101	6
	Equal variances not assumed			5.917	113.887	.000	.48259	.08156	.32101	.64416

Oneway

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ONEWAY ChatGPT_T Grammarly_T Gemini_T TutorMe_T Negative_T Factors_T BY Level

/MISSING ANALYSIS

/POSTHOC=LSD ALPHA(0.05).

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
ChatGPT_T	Between Groups	4.566	3	1.522	4.287	.007

	Within Groups	39.766	112	.355		
	Total	44.332	115			
Grammarly_T	Between Groups	1.830	3	.610	2.880	.039
	Within Groups	23.719	112	.212		
	Total	25.549	115			
Gemini_T	Between Groups	.984	3	.328	1.279	.285
	Within Groups	28.715	112	.256		
	Total	29.698	115			
TutorMe_T	Between Groups	3.308	3	1.103	3.873	.011
	Within Groups	31.888	112	.285		
	Total	35.196	115			
Negative_T	Between Groups	3.941	3	1.314	7.737	.000

	Within Groups	19.015	112	.170		
	Total	22.956	115			
Factors_T	Between Groups	1.175	3	.392	1.590	.196
	Within Groups	27.573	112	.246		
	Total	28.747	115			

APPENDIX G

Post Hoc Tests

Multiple Comparisons

LSD

Dependent Variable	(I) Level	(J) Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
ChatGPT_T	300 Level	200 Level	-.08239	.24601	.738	-.5698	.4050
		100 Level	-.09091	.17966	.614	-.4469	.2651
		400 Level	-.44567*	.14726	.003	-.7375	-.1539
	200 Level	300 Level	.08239	.24601	.738	-.4050	.5698
		100 Level	-.00852	.24601	.972	-.4960	.4789
		400 Level	-.36328	.22345	.107	-.8060	.0795

	100 Level	300 Level	.09091	.17966	.614	-.2651	.4469
		200 Level	.00852	.24601	.972	-.4789	.4960
		400 Level	-.35476*	.14726	.018	-.6465	-.0630
	400 Level	300 Level	.44567*	.14726	.003	.1539	.7375
		200 Level	.36328	.22345	.107	-.0795	.8060
		100 Level	.35476*	.14726	.018	.0630	.6465
Grammarly_T	300 Level	200 Level	.23580	.19000	.217	-.1407	.6122
		100 Level	.07955	.13875	.568	-.1954	.3545
		400 Level	-.15874	.11373	.166	-.3841	.0666
	200 Level	300 Level	-.23580	.19000	.217	-.6122	.1407

		100 Level	-.15625	.19000	.413	-.5327	.2202
		400 Level	-.39453*	.17257	.024	-.7365	-.0526
	100 Level	300 Level	-.07955	.13875	.568	-.3545	.1954
		200 Level	.15625	.19000	.413	-.2202	.5327
		400 Level	-.23828*	.11373	.038	-.4636	-.0129
	400 Level	300 Level	.15874	.11373	.166	-.0666	.3841
		200 Level	.39453*	.17257	.024	.0526	.7365
		100 Level	.23828*	.11373	.038	.0129	.4636
Gemini_T	300 Level	200 Level	.11239	.20905	.592	-.3018	.5266
		100 Level	-.04682	.15267	.760	-.3493	.2557

		400 Level	-.17308	.12514	.169	-.4210	.0749
	200 Level	300 Level	-.11239	.20905	.592	-.5266	.3018
		100 Level	-.15920	.20905	.448	-.5734	.2550
		400 Level	-.28547	.18988	.136	-.6617	.0908
	100 Level	300 Level	.04682	.15267	.760	-.2557	.3493
		200 Level	.15920	.20905	.448	-.2550	.5734
		400 Level	-.12626	.12514	.315	-.3742	.1217
	400 Level	300 Level	.17308	.12514	.169	-.0749	.4210
		200 Level	.28547	.18988	.136	-.0908	.6617
		100 Level	.12626	.12514	.315	-.1217	.3742

TutorMe_T	300 Level	200 Level	.41477	.22030	.062	-.0217	.8513
		100 Level	.11364	.16088	.481	-.2051	.4324
		400 Level	-.17116	.13187	.197	-.4325	.0901
	200 Level	300 Level	-.41477	.22030	.062	-.8513	.0217
		100 Level	-.30114	.22030	.174	-.7376	.1354
		400 Level	-.58594*	.20010	.004	-.9824	-.1895
	100 Level	300 Level	-.11364	.16088	.481	-.4324	.2051
		200 Level	.30114	.22030	.174	-.1354	.7376
		400 Level	-.28480*	.13187	.033	-.5461	-.0235
	400 Level	300 Level	.17116	.13187	.197	-.0901	.4325

	200 Level	.58594*	.20010	.004	.1895	.9824
	100 Level	.28480*	.13187	.033	.0235	.5461

APPENDIX H

VALIDATED INSTRUMENT

Dependent Variable	(I) Level	(J) Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Negative_T	300 Level	200 Level	-.01000	.17012	.953	-.3471	.3271
		100 Level	.26409*	.12424	.036	.0179	.5102
		400 Level	-.21516*	.10183	.037	-.4169	-.0134
	200 Level	300 Level	.01000	.17012	.953	-.3271	.3471
		100 Level	.27409	.17012	.110	-.0630	.6112
		400 Level	-.20516	.15452	.187	-.5113	.1010
	100 Level	300 Level	-.26409*	.12424	.036	-.5102	-.0179

		200 Level	-.27409	.17012	.110	-.6112	.0630
		400 Level	-.47925*	.10183	.000	-.6810	-.2775
	400 Level	300 Level	.21516*	.10183	.037	.0134	.4169
		200 Level	.20516	.15452	.187	-.1010	.5113
		100 Level	.47925*	.10183	.000	.2775	.6810
Factors_T	300 Level	200 Level	.26477	.20485	.199	-.1411	.6707
		100 Level	.19682	.14960	.191	-.0996	.4932
		400 Level	-.01585	.12262	.897	-.2588	.2271
	200 Level	300 Level	-.26477	.20485	.199	-.6707	.1411
		100 Level	-.06795	.20485	.741	-.4738	.3379

		400 Level	-.28062	.18606	.134	-.6493	.0880
	100 Level	300 Level	-.19682	.14960	.191	-.4932	.0996
		200 Level	.06795	.20485	.741	-.3379	.4738
		400 Level	-.21267	.12262	.086	-.4556	.0303
	400 Level	300 Level	.01585	.12262	.897	-.2271	.2588
		200 Level	.28062	.18606	.134	-.0880	.6493
		100 Level	.21267	.12262	.086	-.0303	.4556

*. The mean difference is significant at the 0.05 level.