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Machine Learning: The Role of Artificial Intelligence in Optimizing Student's Performance and Behavior

A Case Study Presented to the
Faculty of AMA Computer College Tarlac
In Partial Fulfillment

of the Course Requirements for the Subject
Artificial Intelligence: Fundamentals

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Chapter I
INTRODUCTION AND ITS BACKGROUND

Introduction

In recent years, AI and social media have changed our daily lives in a big way. They've shaken up how we talk to each other, hang out, and get our info. This shift matters a lot to young people, who depend on these tools for school and pretty much everything else they do. Despite their importance, the combined effect of AI and social media on academic performance and mental health remains insufficiently studied and requires further investigation. Generative AI, exemplified by tools like Chat GPT, has emerged as a noteworthy development in AI applications, serving as a vital virtual assistant in higher education. The diverse benefits offered by these AI systems make it crucial to evaluate their influence on university students' academic performance and mental health (Shahzad et al., 2024).

Artificial intelligence positively affects student behavior and academic performance. AI hardware is used for data mining and modeling techniques to analyze and predict student behavior and performance. If large data are analyzed, AI can help teachers

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understand students' learning styles and specific states, leading to more personalized teaching approaches AI tools can also be used by students themselves to improve their academic performance, with a majority of college students expressing a desire to actively use AI tools for this purpose The implementation of AI and computational The inclusion of life sciences within the classroom pedagogical procedure was found to increase student achievement, attitude, and motivation toward learning.. Accurate performance prediction for students making use of AI shall not only avoid dropouts but also give the future student an idea of the fields in which they can build successful profiles. This, in terms of its grand scope, can allow AI to enhance both student behavior and academic achievement by making use of individualized approaches and predictive analytics.

AI and social media have revolutionized educational models and reshaped how students engage with digital content and their social circles. Prior research highlights AI's ability to facilitate information access, peer connection, and participation in online communities. However, continuous exposure to algorithm-driven content and the allure of social platforms could have significant effects on both academic performance and mental well-being. Previous studies have shown that incorporating Generative AI like Chat GPT into higher education can lead to improved academic outcomes. These AI systems provide personalized support, instant feedback, and extensive information resources, enabling students to understand complex subjects, enhance problem-solving skills, and enrich their learning experiences (Shahzad et al., 2024).

Enormous data sets can be analyzed by AI and Machine Learning technologies, which can to uncover designs and produce until now unimaginable estimates. These instruments can be utilized within the instructive setting to track and upgrade understudy execution, spot and near learning holes, and indeed estimate future academic success. Through the utilize of assorted information sources, counting participation records, grades, and behavioral signs, fake insights (AI)-powered frameworks can outfit teachers with personalized suggestions and bits of knowledge that are relevant to each student's needs. One of the key benefits of integrating AI and Machine Learning into education is the potential for personalized learning. By leveraging these technologies, teachers can make customized learning experiences that adjust to person students' qualities and weaknesses. This personalized approach not as it were making a difference in closing learning gaps but moreover cultivates a more locks in and compelling learning environment. For occasion, AI can prescribe particular learning assets or works out based on a student's advance and regions of difficulty, in this manner improving their overall academic performance.

In a related study from 2023, Inmaculada García-Martínez, José María Fernández-Batanero, José Fernández-Cerero, and Samuel P. León analyzed the effect of AI components and computational sciences on student performance. Through a systematic review and meta-analysis of 25 articles from WOS and Scopus databases, they found that AI positively impacts student performance, particularly enhancing attitudes towards learning and motivation in STEM (Science, Technology, Engineering, and Mathematics) areas. They also highlighted the educational and ethical challenges of implementing these technologies, calling for further research into their design and application (García-Martínez et al., 2023).

Similarly, Mircea Mureșan (2023) delves into the significant impact AI has had on education over recent decades. Muresan illustrated that AI replicate the intelligence of human such as discipline, behavior, solving problems using various types of algorithms and mathematical formulation made by AI developers. Schools bringing in AI-powered learning

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tools have caused a big change in how we teach and learn. This research aims at this is to test how these AI learning helpers have affected the way students do in school and how much they understand. These have become prominent instruments in this digital age, characterized by the rapid development of technology. By so doing, the impact of these instruments is an imperative that ought to be understood for informing education practices and policies. A lot of talk has been sparked by AI in education because it may improve learning altogether. But to make use of AI's good points and deal with the bad ones, we need to know how both of these things affect schools. This paper looks into what AI tools mean for education and why they matter in today's schools. We're doing this study to fill in what we don't know yet.

Statement of the Problem

The main purpose of this study is to gather information from the College Students of AMA Computer College Tarlac on the role of artificial intelligence in student's performance and behavior especially, the researcher's objectives in conducting this research are:
[1] To find out what is the role of artificial intelligence in student's performance and behavior.
[2] To find out how artificial intelligence improves the performance and behavior of students.
[3] To find out why Artificial Intelligence is important in optimizing student's performance and behavior.

Significance of the Study

The study will determine the role of artificial intelligence in optimizing the student's performance and behavior. Being such, this study is deemed beneficial to each and every student.

The research is of great significance because it enables students to discover subjects and make their knowledge and understanding deeper in tough abstract, they can use machine learning to explore and gain knowledge to their daily tasks at school. This could lead to more successful learning and enhance academic outcomes for students.

Likewise, instructors will find it useful as well. They help to enrich their instruction methods, and personalize learning in ways that they can leverage machine learning to achieve new levels of productivity; utilize appropriate digital technologies to support and expand opportunities for teaching learners, and increase Student Support and Engagement. They can also use Artificial intelligence in generating lesson plans.

To the future researchers working on similar study. This study would be valuable to gain knowledge and understanding. They can use this to handle dull tasks, researchers can also use this study and predict complex systems in machine learning. They can also use this to find relevant source for their study, helping them to generate new ideas. By this, researchers can understand the effectiveness of artificial intelligence and how machine learning can help them to acknowledge things using AI.

Scope and Delimitation

The study is aim to understand the role of artificial intelligence in optimizing the student's performance and behavior on the application of machine learning. The study will be conducted at AMA Computer College Tarlac situated at San Roque Tarlac.

This study is delimited to all college students of AMA Computer College Tarlac, 30 respondents from College Students of School Year 2023-2024 and a professional/expertise

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have to answer and complete the questionnaires prepared by the researchers as means of gathering the needed data.

Definition of Terms

As words may mean differently in different context, below are the definitions given as the words used as intended to be understood for the purpose of this study.

Optimizing - Achieving the highest level of functionality and effectiveness. In AI, this often involves refining algorithms to maximize performance and efficiency.

Behavior - A system's responses to inputs, expressed as actions or reactions. This can include how an AI system reacts to user commands or environmental changes.

Data Mining - Gleaning information and patterns of value from massive data collections. It helps find hidden patterns, connections, and insights in big sets of data.

Modeling Techniques - Methods to model and simulate real-world processes to analyze and predict outcomes.

Enormous - Exceedingly big in quantity or size. Often used to describe large datasets or extensive computational requirements in AI.

Leverage - Making the most out of something. In AI, leveraging data and computational power to improve model performance.

Algorithm-Driven - processes or systems heavily rely on algorithms for decision-making or operation. Algorithms are sets of instructions or recipes created to tackle issues or carry out particular jobs. People often use them in computer science and artificial intelligence to make processes run on their own.

Computational Sciences - is when computers are used to address challenging problems in diverse areas such as science, engineering, biology among others. It involves the construction of models and simulations to understand and predict real-world phenomena.

Meta-Analysis - Data from many studies seem to be combined to provide a complete understanding of the situation. So now you see the whole picture and can make better decisions.

Algorithms - These are defined steps or step by step procedures and formulae for solving problems or doing a task.

Complex Mathematical Models - They are complex representations of phenomena in the real world, usually in the form of mathematical equations or algorithms. Models find applications within physics, economics, and artificial intelligence to simulate behavior, usually predicting it through complex calculations and simulations.

Prominence - A state of wide recognition, importance, or general notice in the scheme of things. Some technologies, methodologies, or systems in AI and computational sciences come to the fore because of their impact, effectiveness, or originality of approach.

Vital Virtual Assistant - Basically, it's an essential digital device that works with AI to do a number of tasks through voice commands or by any other type of inputs. For example, Siri, Alexa, or Google Assistant can help a user in scheduling, retrieving information, and home automation.

Crucial - it means something that is really important or necessary, mostly a must-have requirement if a particular result or outcome has to be achieved. In AI and computational sciences, crucial elements may include foundational algorithms, critical data sets, or key technological advancements that drive progress and innovation.

Chapter II
REVIEW OF RELATED LITERATURE AND THE STUDIES

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This chapter presents the review of related literature and studies both in foreign and local. The cited literatures and studies highlight the significant details, concept and related theories about the role of artificial Intelligence in optimizing the student's performance and behavior.
Related Literature

A. **Foreign Literature**

According to (Chatterjee & Bhattacharya, 2020) when we talk about the growth or development of the human race in every field, education cannot be left behind. Data Mining (DM) is the main branch or tool in AI which assesses examples and finds patterns and then processes them to improve the system. Similarly, Data Mining helps educational institutions to assess previous records in their student database and even merge databases with other stakeholders to make changes to improve. Also, AI tools like recommendation systems (Yadav et al., 2016) and educational gaming apps (Zirawaga et al., 2017) helps the learner in a much better way and make education easy and interesting for all.

Using many AI techniques and research, we developed a theory that, besides these factors several social, demographic, behavioral, and non-behavioral traits also have a big impact on his performance. When we talk about a student's performance, we mean their grades, which show how well they do in a specific class or among other students. But we can't just look at students' grades because society relies on many things. It's possible that a student who excels academically benefits society little, while a student who struggles academically benefits society considerably more. The student's attitude, body language, and overall personality are the only factors contributing to this (Chatterjee, Rana, et al. 2020).

According to Loyens et al. (2008) Learning is a spontaneous behavior to meet individual needs, believed that learning is an active behavior, which must be carried out by earners themselves. Learners construct their knowledge from what they have. Self-regulated learning (SRL) is very much in research in education nowadays and is an umbrella term for various processes such as goal setting, metacognition and self-assessment all of which affect learning in various ways. Training programs that promote self-regulated learning has been found to be beneficial for students. Also, self-regulated learning is a good predictor of academic performance.

Motivation has an This would have a significant impact on how well they are able to perform in school [Donnermann et al. 2021; Law et al. 2010; Law et al. 2019). This is because motivation closely links to the way people learn (Vallerand et al. 1992). Research shows that when people feel anxious about technology, they often get confused about what they need to do. This lowers their motivation and changes how they adopt or use new tech (Davis et al. 1992; Meuter et al. 005; Meuter & Bitner Citation1997; Parasuraman 2000; Teo et al. 1999). Studies confirm that anxiety hurts learning motivation (Igbaria 1993; Piniel & Csizér 2013; Smith & Caputi 2007). However just because someone isn't anxious doesn't mean they're level of motivation (Gardner et al., Citation1992; Piniel & Csizér, Citation2013). Not much is known about the relationship between AI anxiety and AI learning motivation so the impact of the former on the latter should be investigated especially with intrinsic and extrinsic motivations respectively. According to Ilie Gligorea et al. (2023) adaptive learning in e-learning is about the idea that learners have different backgrounds, learning styles and cognitive abilities. Traditional e-learning designs commonly provide the same contents and activities for every learner with no individual characteristic and needs accommodated into consideration. The same learning processes are experienced by all students in the current

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conventional e-learning settings since education has always followed a "one size fits all" approach. The different learning styles and preferences of students are not considered in this type of learning. This method can result in less-than-ideal learning experiences. Some students might find the material too challenging or too simple leading them to lose interest or make little headway. Tailoring education to a student's requirements and learning style has become achievable. The creation of flexible online learning platforms has helped to make this possible.

B. **Local Literature**

According to Carie Justine P. Estrellado and John Christian Miranda, 2023, May, with the increased utilization of Artificial Intelligence into the Philippine educational system catapulting scholarly discourses on the line, this paper argues on academic concerns and challenges of AIED, the initial footholds for data center hubs, potential offerings for enhanced learning experiences and data-driven decision-making, with foreseen opportunities. On the contrary, AIED requires a robust technological infrastructure and adequate computing. Resources line up with policy frameworks tackling issues like data-privacy worries, the digital gap, and the need to train and develop faculty. This looks at existing research considers teamwork between teachers and those who make policies zeroing in on teaching and learning aspects while tapping into AI's upsides as long as we think about the social and ethical effects. AI had already made its way in many fields, including education. Undoubtedly, AI is helpful in the education Sector particularly when paired with a high-quality learning material which will help materials and instructions (Lee & Koh, 2020). As the Philippine government catapulted the National AI Roadmap and the establishment of National Centre for AI Research (N-CAIR) prove that the country will embrace with passion the AI technology as strategic directions that are expected to tailor its curricula by the education. But AI is not alone-wide–term its conjuncts array of technologies, take for examples stepping up for the smart campuses, in the Philippines, universities and colleges are starting to adopt the smart campus concept, leveraging next–generation digital infrastructure technologies such as cloud-based access control, machine learning, artificial intelligence, big data, Internet of Things, to mention but a few in improving operational efficiency and create Convenient experiences for students and faculty. Some HEIs in the Philippines have already started implementing smart campus approaches, such as the Mariano Marcos State University, which received a grant of PHP24.9 million from the Commission on Higher Education to improve its information technology infrastructure, and the University of Northern Philippines, which has started to implement smart classroom approaches to enhance the quality and access of learning materials to its students (PNA 2021; PIA, 2021). Smart campus technologies have numerous advantages that are infused with AI. These include the improvement of campus safety, enhancement of user experiences, and personalization of learning and living environments of learners. AI is everywhere. Popular list of various digital tools and resources which teachers and students can use in the academe, including e-learning platforms, digital pin boards, collaborative tools, and lesson planning apps. Moreover, Google, among other search engines has turned into a tool of research by Teachers and learners; for example, 94% of the teachers report that students use the term "research" to mean using Google. Other digital tools and resources also include flashcard generators, education quiz apps like Quizlet, citation generators, plagiarism checkers, copywriting tools, and virtual assistants such as these. These digital tools and resources bring vast amounts of information, which provides the platform for students and teachers to affiliate, collaborate, and work together in new and imaginative ways that

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change conventional concepts of teaching and learning techniques. AI-driven systems are able to profile student progression, locate strong and weak points, and consequently suggest relevant learning materials and activities based on the needs of each particular student. This would help an educator design more effective learning paths Teachers can use Grammarly as an AI helper, along with good tools and teaching resources, to teach grammar in higher education since it also provides suggestions as to why something must be changed. The explanations AIs provide give teachers a clear picture of what they can teach students and, at the same time, offer students' knowledge they can apply in future or upcoming activities. Other common AI tool to combat plagiarism scanning used by students is the Quill Bot available on the market highlighting paraphrasing prowess and other its functions to help writers furnish contents; Fitria, 2021. However, not all the time AI is celebrated because it can also be abused by some. For example, on January 18, the University of the Diliman began investigating some students who used AI for their academic work. Instances such as these make AI in education a "double-edged sword" because it produces and posits both benefit and threat to the current educational system, and a weapon people might misuse it if it falls into the wrong hands (Hagendorff T., 2020). To counter this, teachers could change how they assess students, like Prof. Dr. Roumiana Peytcheva-Forsyth spoke the about the opportunities and challenges of e-assessment and The TeSLA project tries to prevent and detect online cheating and promote academic integrity. Her presentation in the virtual conference held by ICODeL in 2021 zeroed in on the issue of cheating in online assessments and the results of the TeSLA project as a baseline model. On the part of school administration, AI could also support teachers and school heads in lessening their workloads. As AI can also be applied to automate tasks like grading assignments, monitoring students, and preparing schedules, this will leave educators the opportunity to use more of their time for teaching, engaging with students—making the learning experience even better. Among those premises indicted were education goals found in the Basic Education Development Program 2030 program of the Department of Education, that shall be predictive models, making AI facilitate data-driven decision-making in schools—by providing insights and recommendations based on collected data, help the Institution's Decision-Making in a more informed way about resource allocation, curriculum development, and student support programs. The Philippine government, speaking of upholding work efficiency, has recognized the potential of AI in various industries, including Education In 2021, DTI launched the National AI Roadmap, which in essence is a plan to look for opportunities and challenges in AI presenting Philippine industries by the year 2024. This step therefore classifies our readiness for AI with four dimensions: digitalization and infrastructure, research and development, workforce development, and tasks. It shall further transpose facilitation of small businesses or items in the MSMEs sector. The opening of a National Center for AI Research is also scheduled for the works to further push for newer technologies and support for the private sector. Last March2023, Tau Leng with other experts had a courtesy call with Dr. Enrico C. Paringit1 during the AI Pinas Research and Development Conference to discuss prospects in making the Philippines an AI data hub. He talked about developing AI applications for the country, back in areas like energy to utilities and cutting-edge scientific technologies, and other sectors leading this beacon of digitalization. Despite being a game-changer, using AI technology can be expensive in terms of its installation, maintenance, and repair fee. In sum, this research pioneered an investigation into this novel area of AI awareness, usage, and perception by college students. Informed by the convergent-parallel mixed-methods design, the quantitative data

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from the survey were combined with qualitative response data, it elicits the impact of AI on education. Society. According to Jocelyn H. Hua, 2023-12-20, Artificial intelligence has become so pervasive, reshaping Among all the other facets in students' lives, the present research has surveyed one of the more virgin territories of AI. Awareness, utilization, and perception among the population of college-going students. Convergent parallel mixed-methods design was used to merge quantitative data from the survey with qualitatively solicited responses on how AI impacts education and society. The survey in particular shows that the familiarity of AI depends on age, academic year, and field of study. The results underline the requirement for targeted AI education to reduce knowledge inequalities, particularly among the younger cohorts and sectors of activity where knowledge about AI is very low. Although it is quite moderately used in academic and personal life, its use in insights entails academic research, job administration, and language translation. Varied uses of AI call for procedural change by the institution, and the impact on society steps into the main way as being positive. Such positivity overshadows concerns about the cumulating job deficit, data privacy breach, and technological overuse, with human decision making balancing the scale. Thereby, comprehensive AI educational programs are a felt need to address and span through these varied opinions. It therefore underlined the need for institutions and policymakers to be preemptive amidst the disruption that artificial intelligence is causing to many firms and social Systems: Students need to have achieved so-called AI literacy—that is, knowledge plus practical application—with which they can understand their way through the complexity and opportunity that is laced into the AI-driven environment. The challenge is to teach both technical skills in the area of AI and deep learning in relation to the social and ethical implications of AI. It can help students prepare for a future in which the place of artificial intelligence is gaining momentum by: understanding these effects and teaching accordingly. According to Shaun Kim Sopera, John Stephen Alaban, Zaira Briones, Nicko A. Magnaye Artificial intelligence (AI) is a very useful technology. They uphold education by providing students in college with more personalized and efficient learning environments. This this study focuses on how AI works in education and on ways in which AI can assist to improve teaching and learning outcomes for: The respondents were the students and teachers at Mindoro State University. It shall survey the students and instructors to assess their views on AI, evaluate the benefits and obstacles of AI in education, and come up with strategies for successfully incorporating AI into teaching and learning techniques. It will question students about their idea of AI and their personal experience with AI-powered learning tools. Out of this study, results have proved that students and teachers at the University have very strong beliefs, with a positive outlook on the ability of AI to greatly enhance. The learning journey and its results for students and teachers, as shown by the 4.37 weighted mean score for all groups put together. In consideration, the results show very strong agreement, at an average mean score of 4.23, which interprets to "strongly agree," on the potential of AI to improve considerably student and how students learn and teachers teach at the University. The results of the study will help in this regard. Enlighten educators and policy makers regarding the proper and effective ways of using Artificial Intelligence in improving learning outcomes among students.

Ely Christian Balaquiao says this research checked how AI tech can boost student performance in a clever game-based learning setup. The study also examined whether Math's AI-driven gamification techniques improved learning motivation, engagement, and achievement. It used a descriptive evaluative and quasi-experimental design. In the pretest and post-test, descriptive analysis was used to evaluate students' performance while

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evaluative design distinguished the control and experimental groups. To assess whether there were any changes to the dependent variable due Quasi-experimental design: Measured pre- and post-treatment variables for significant effects of treatment. Differences. These findings indicate that integration of Artificial Intelligence (AI) technology during instruction increased Mathematics in the Modern World class performances among students in Experimental Group. The Remarkable progress by learners when Artificial Intelligence technology started being used indicates. Its importance toward better teaching efficiency makes it of wider application within academic. Environments, however, are a little different. The findings of the study may be context-specific; generalize ability could therefore be limited. As variations in settings of education and the technological infrastructure may either positively or negatively influence the effectiveness of AI-based gamified approaches.\

Related Studies

A. **Foreign Study**

Abuzinadah et al. (2023) highlight the need of employing educational data mining (EDM) to forecast student performance. They draw attention to the fact that artificial intelligence (AI) can efficiently evaluate this data in order to predict student performance, assisting students in avoiding failure and improving learning results. In order to overcome issues with low accuracy, unbalanced data, and intricate feature engineering encountered by other approaches, the study presents a machine learning framework that incorporates deep convoluted features to predict academic success. The researchers evaluated performance with both original and deep convoluted features, and by utilizing the synthetic minority oversampling technique (SMOTE), they discovered that the latter greatly increased prediction accuracy. A notable improvement in AI-driven teaching aids, the additional tree classifier employing convoluted features obtained an impressive 99.9% accuracy, exceeding state-of-the-art techniques.

Jang, Choi, and Kim (2022) talk about the advantages of early student performance prediction in terms of giving at-risk kids focused educational help. Though it has great potential, there hasn't been much real-world use of this technology in education. The authors suggest a technique to forecast student performance that combines explainable AI (XAI) with machine learning. In order to find pertinent qualities, they carried out qualitative study with educators, parents, and legislators. These findings were then further refined using correlation analysis. After testing several machine learning algorithms, the results showed that Logistic Regression performed the best. The end strategy made the prediction process more visible and helpful for educational stakeholders by using XAI to visually show actionable information for every student. The experiment's result, the best overall performance was manifested by Logistic Regression. Finally, using the XAI technique, visual information was provided which was intended to help each student.

According to IAN GOODFELLOW, YUSHUA BENGIIO, and AARON COURVILLE long looked forward to building machines that could think. This is clearly the goal ever since at least by Pelaeolithic times. All the mythological progeny of Pygmalion, Daedalus and Hephaestus can be seen as the conceptual ancestors of the modern computer, and all of Galatea, Talos and Pandora as its modern artificial siblings (Ovid and Martin, 2004; Sparkes, 1996; Tandy, 1997). But long before one was finally built, when programmable computers were first envisioned, people wondered if such machines could become intelligent. The notice of early days of the artificial- intelligence field, that it was able rapidly to attack and solve problems which were intellectually difficult for a human being, but instead easy for computer was

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relatively encapsulated encouraged people to do so. These were problems that intuitively feel automatic—like recognizing spoken words or faces in images.

It's a book about a solution to. Those more intuitive problems: the solution to computers' learning from experience and understanding. The world in terms of a hierarchy of concepts, each defined through its relation to simpler Concepts: This approach, through the acquisition of experience-based knowledge, eliminates the use of a human operator. Formal specification of all the knowledge to be used by a computer. This book tackles a way to solve these more instinctive issues, it focuses on the concept hierarchy that enables computers to grasp complex ideas by breaking them down into simpler ones. If we draw a graph showing how these concepts are built on top of each other; that is, the graph is deep with many layers. For this reason, we call this Approach to Deep AI in Learning: Yoon et al. As a point of fact, AI turns out to be a reliable replacement for certain human automobiles, which are the prevalent facilitators of the user services. Gujral et al. talk about AI's particular roles and applications in academic libraries, for example, data curation for collection management and digital preservation and navigating new information territories to grasp the scholarly communication landscape better. While AI is doing some tasks by itself and without any intervention from human beings, it can optimize librarians' productivity and efficiency.

B. **Local Study**

According to Bancoro, J. C. M. (2024, February). Artificial Intelligence, Renowned for its data interpretation, learning, and task achievement capabilities, artificial intelligence (AI) has gained popularity in various industries and academies due to enhanced efficiency and quality. This research will establish the extent of AI usage among these students' concerning functionality, availability, and complexity, assessment scores, course mastery, and grading metrics. This study ascertains whether there is a relationship between the usage of A.I. and their academic performance. The study respondents are 293 Business Administration students from Negros Oriental State University Main Campus 1, Dumaguete City. The results of the study show that students' use of AI is relatively average with regard to functionality, availability, and complexity. On the other hand, the students' academic performance was above average because it showed very high marks on assessments, course mastery, and excellent grades. AI tools maintain individual learning experiences, provide immediate feedback, and enable collaboration. However, it needs further development and improvement: training, accessibility, research, control, and sharing of best practices.

In the study of Balaquiao, E. C. (2024). The concept of Artificial Intelligence (AI) technology being utilized to make students' performance improve inside a smart learning environment with the use of games a lot which is another way of saying that the content is written in modern colloquial language. Only in this sense, the task is done with competency. This study was conducted to gauge the effectiveness of embedding AI-driven gamification techniques in Mathematics in the Modern World classes and to determine the impact of the suggested techniques on students' engagement, motivation, and academic achievements. It utilized a descriptive-evaluative and quasi-experimental design. Descriptive design checked student performance in the pretest and posttest, while comparative design determined the differences between the control and experimental groups. The Quasi-experimental design measured the variables' existence before and after the treatment to note significant differences, checking whether the treatment caused a change in the dependent variable. Results showed that there was a significant difference in the students'

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performance in classes on Mathematics in the Modern World after the integration of Artificial Intelligence AI technology in the instruction in the experimental group. In this respect, the notable enhancement in the performance of students after the incorporation of Artificial Intelligence technology demonstrates its effectiveness in increasing instructional effectiveness and is a reason for its wider implementation and research in a several of educational settings.

If the dramatic improvement in the performance of the class after the integration of AI technology is anything to go by, then AI has the positive impact of improving instructional effectiveness and requires a broader implementation and exploration in the learning environment. Adopted with the rapidly developing times in technology, the use of artificial intelligence has been rampant and has changed most of the aspects of the students' lives. It means that targeted AI education is needed to fight knowledge inequalities within the youth cohorts and fields with little expertise in AI. AI usage is usually modest for academic purpose and personal use, whereas insights include its uses in academic research, job administration, and language translation. Varied in this area of application, AI requires institutions to change their procedures and has impacts on society that are largely viewed positively. EXPRESS CONCERNS about job loss, invasion of data privacy, over-reliance on technology, and human decision-making. Thus, comprehensive AI education programs must be designed to consider these different opinions and navigate them. Results present a strong case before the institutions and the policymakers to be more proactive in making the artificially intelligent companies and social systems work fully. AI literacy is what students should learn, both in knowledge and practice, to deal with the complexity and opportunities brought about by the environment driven by AI. This requires technical teaching that has gone deeper in understanding the social and ethical implications of AI. By understanding these effects, institutions can tailor teaching to prepare students for a future of increasing importance of artificial intelligence.

According to researchers, among the other gains of using AI in higher education include increased diversity, reduced administrative costs, and being digital transformation of the learning-teaching process (-Pisica et al., 2023). Yet, extreme use of AI has led to for these very reasons, students are led to cheating and plagiarism for many reasons in their personal life and mental health.

According to (C. Estrellado and J. Miranda, 2023), the paper discusses the academic concerns and challenges associated with the integration of Artificial Intelligence (AI) in the Philippine educational system, highlighting the need for a robust technological infrastructure and enough computing resources that aligns with policy frameworks. Collaboration between educators and policymakers is emphasized as essential for leveraging the benefits of AI in teaching and learning, while ensuring that social and ethical implications are carefully considered or reconfigured. Key issues such as data privacy concerns, the digital divide, and the necessity for ongoing faculty training and development are identified as critical aspects that need to be addressed when implementing AI in education. The paper underscores the significance of establishing data center hubs, enhancing learning experiences, enabling data-driven decision-making, and exploring future opportunities in the context of AI in education.

(J. Aborot et al, 2022) conducted a study that the research paper focuses on addressing the challenges in Science and Mathematics Education in the Philippines, along with the declining interest in agriculture among the youth. A plant-growing system called "GuI.ai" or "GuI.ai.ai" is presented in the study that is based on the involvement of AI and IoT and that is

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developed also for school teachers to integrate the plant-growing lab into their school project ideas. The purpose of the system is to stimulate the students to seek STEM studies by training students to develop interest in science and technology, engineering, and mathematics as well as through appreciating the importance of agriculture. The project is designed to improve student performance in STEM subjects and to be a solution for the food crisis in the country by integrating technology with alternative ways of growing crops. The outcomes of the research and development work are expected to positively impact students' learning experiences, encouraging them to explore the intersection of technology and agriculture for sustainable development.

As stated by (A. Nazareno et al, 2019) in their research paper, the study applied artificial neural network (ANN) models to predict the career strand of incoming senior high school students based on their grades in five major subjects. This approach aimed to assist educational institutions in developing programs beneficial for students' learning by predicting their track choices. Different ANN models were considered and compared in the study. The highest accuracy achieved among all the models was 74.1% when predicting the career strand of students. The research used a sample of 293 student data information for training and testing the ANN models. This sample size was crucial in evaluating the effectiveness of the predictive models in determining the students' career paths.

Conceptual Framework

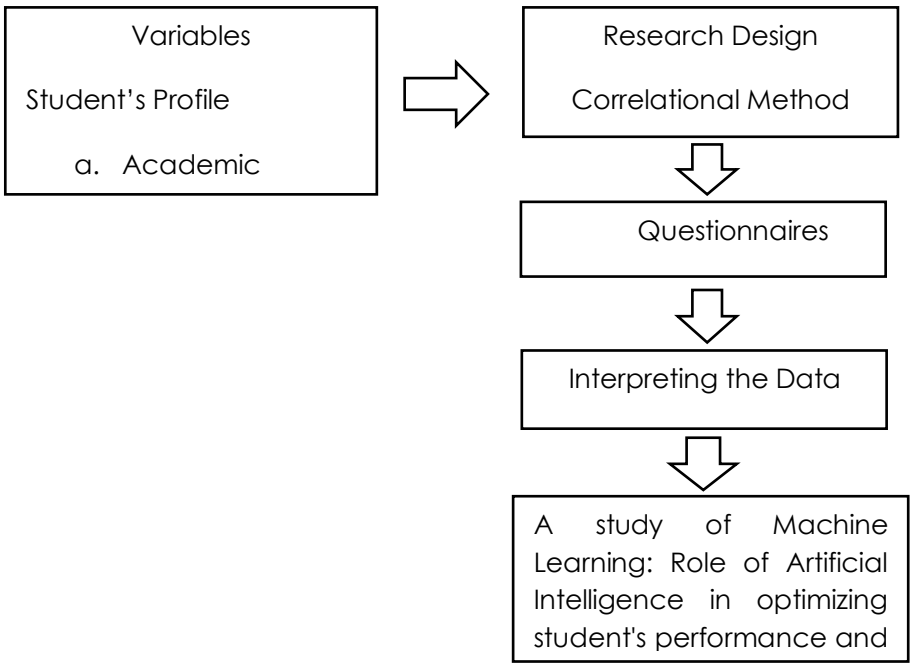

Diagram 1. Paradigm of the study

The paradigm above shows how the researchers will conduct the study. First the researchers will pick their respondent in AMA Computer College Tarlac by selecting sampling. The researcher will ask their permission for questioner. After acquiring the necessary

Table 1

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information for this study, the researchers will then be going to interpret and have the conclusion from the data that will be gathered. The result of the survey will be used to help people especially students who are using AI to determine the role of Artificial Intelligence in optimizing Students performance and behavior.

Chapter III
METHODS OF STUDY AND SOURCES OF DATA

This chapter presents the method that the researchers will use to gather and assess the data needed for the completion of the study. It includes research design, research locale, method of gathering data respondents of this study and statistical treatment used by researchers.

The Research Design

The researchers use a Correlational method in determining the study of student's performance and behavior in AMA Computer College Tarlac through Machine Learning. The Correlational research will be used to obtain information concerning the student's performance and behavior.

In this study the information will be conducted through questionnaire that will be ask to students in AMA Computer College Tarlac. Correlational design is chosen to meet the objective of the study and for the implications of optimizing student's performance and behavior.

Research Locale and Respondents

This study was conducted at Tarlac City. This city was selected for knowing the efficiency of the study of the Role of AI in optimizing student's behavior and performance. This study was been accomplished to the students of AMA Computer College Tarlac for 1st year to 4th year college level. The research study was implemented inside the premises of AMA Campus, the rooms was clean, well-ventilated, air-conditioned and had enough chairs for every student who participated with the activity.

Data Gathering Procedure

Before this research study the researchers will be conducted present a letter of approval to the dean of AMA Computer college Tarlac Mr. Federico Aquino, and after that the researchers will humbly submit the research study and hoping of approval to Mr. Dionisio Tabliga. The researchers also prepared a questionnaire about 1-2 pages containing questions about Machine learning in optimizing students' performance and behavior. The respondents will be given enough time to answer, so that the researchers will have the desired possible output, and making sure that the researchers will be present onsite so the respondents will have their questions acknowledged. Lastly the researchers will make sure to use the time allotted well to avoid distractions like class discussions.

Technique in Gathering Data

The researcher will use probability sampling technique which is simple random sampling.

The Research Instrument

The researchers will use questionnaires as the instrument to collect the needed data in this study. The prerequisites for constructing a suitable data-gathering instrument were

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taken into consideration when creating the instrument. The questionnaires will be distributed to the Students of AMA Computer College and carefully created and will be based on the researcher's readings, existing study, and dissertations relevant to the study. By this instrument, researcher can interact with the research respondents to avoid false details and takes the survey full minded.

Chapter IV
PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter examines the results and analysis of the qualitative data and the compiled questionnaire, alongside the study's quantitative findings. It also compares these findings with previous research and available literature to highlight similarities and differences between this study and earlier work.

Questionnaire

It provides a uniform set of questions to all participants, ensuring consistency and standardization in data collection. This uniformity guarantees that each respondent is given the same prompts, which helps eliminate potential biases or variations that might arise from differing question phrasing or delivery. Additionally, this approach ensures that the answers are systematically documented, allowing for accurate interpretation and analysis of the data. By maintaining consistency in the questions asked, the reliability of the collected data is enhanced, facilitating a more straightforward comparison and synthesis of the responses.

Methods

The researchers decided to approach this topic in a correlational method using a Likert-Scale and Survey form. The survey will contain questions that are related to the topic and gather their opinion about it. The survey will be made in Goggle forms and distributes digitally.

The population target will be college students of AMA, the researchers will also distribute the survey to AI expert. This way we can see the relationship between variables.

The data gathered using these questionnaires will be used for the completion of the study and will be treated with outmost confidentially.

Data Analysis

Following the review of the respondents in the evaluation process, the researchers totaled the information that they acquired using the Likert Scale, as shown in table 4.1. The Likert Scale involves asking respondents to evaluate statements based on subjective or objective criteria, typically measuring their level of agreement or disagreement. This method allows the researchers to assess the system's capacity effectively. To meet the project's stringent formal requirements, the collected data must be meticulously analyzed.

The researchers conducted a comprehensive assessment of the perspectives and thoughts of 30 respondents from AMA Computer College Tarlac. This evaluation aimed to explore the various ways in which artificial intelligence (AI) impacts and influences both student behavior and academic performance. By engaging with a diverse group of respondents, the study sought to gain a deeper understanding of the nuanced effects of AI technologies on students' learning experiences, their engagement with educational content,

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and their overall academic outcomes. The research collected qualitative and quantitative data to provide a well-rounded view of how AI is shaping the educational environment at the institution.

Figure 4.1 Result of AI-based tools helpful in improving your understanding of difficult concepts.
Figure 4.2 Result "AI can enhance your critical thinking skills"

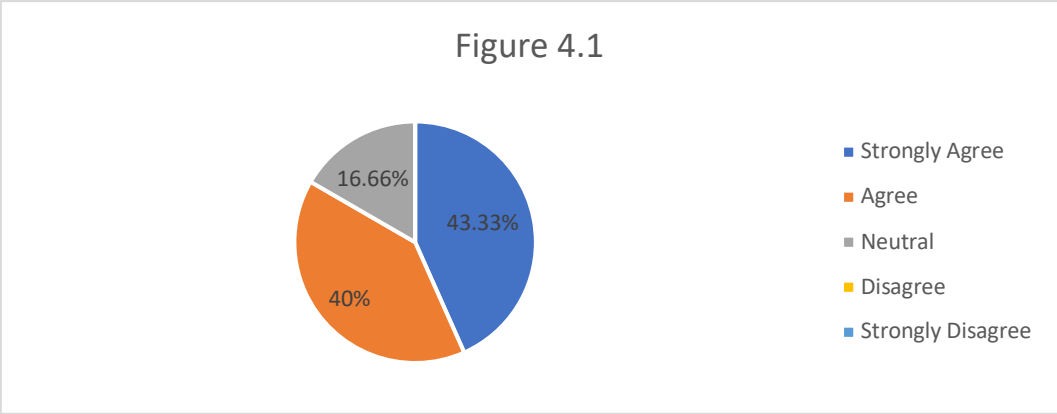

Figure 1

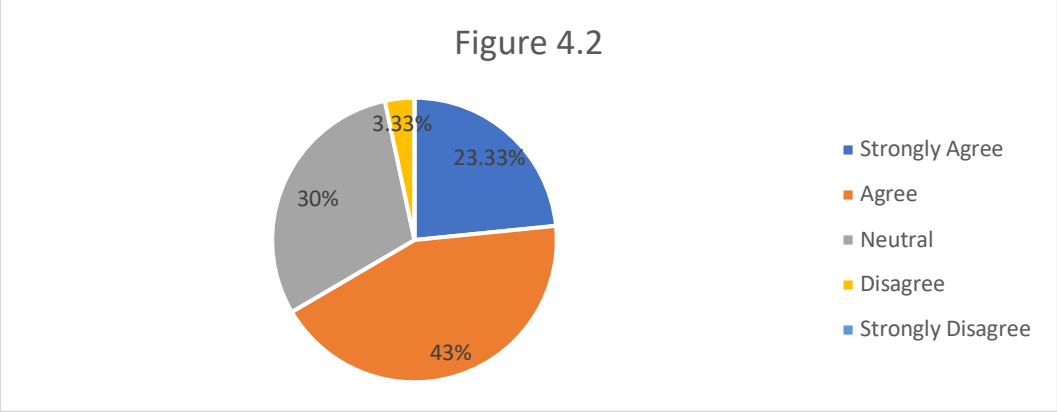

Figure 2
Figure 4.3 Result "AI provide valuable insights into your learning outcomes"

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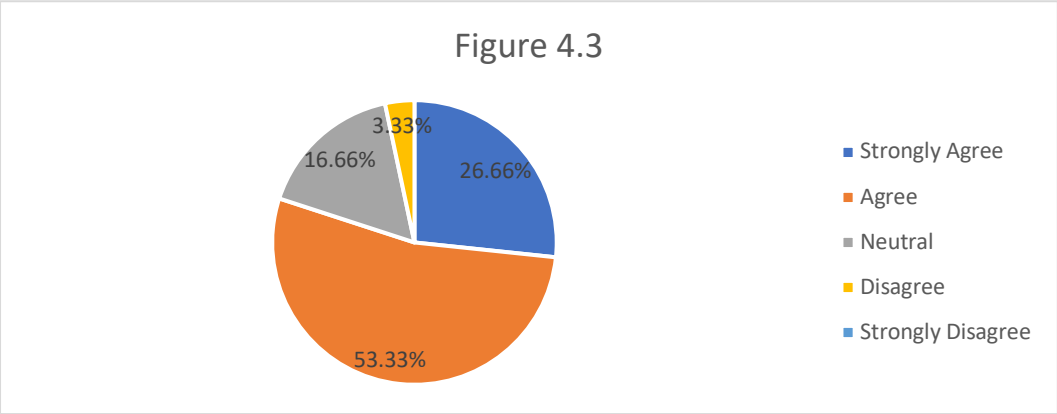

Figure 3

Figure 4.4 "The information provided by AI tools are accurate and reliable"

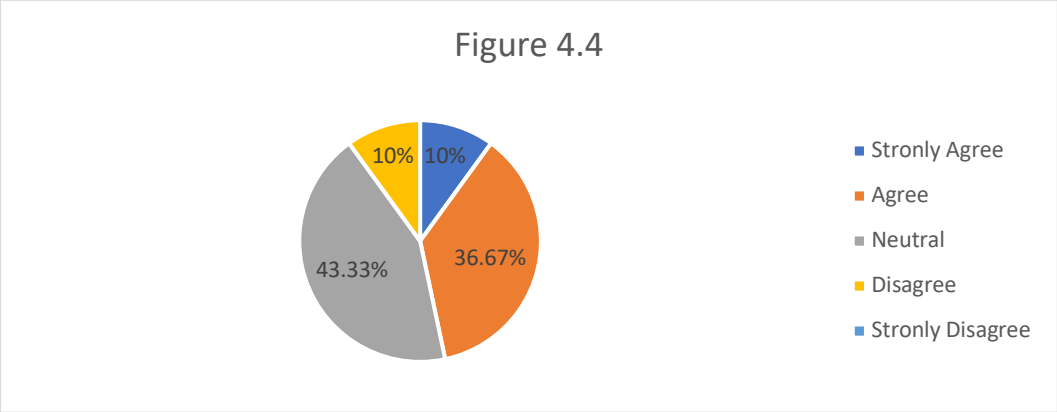

Figure 4

Figure 4.5 "Relying on AI tools for your academic support is comfortable"

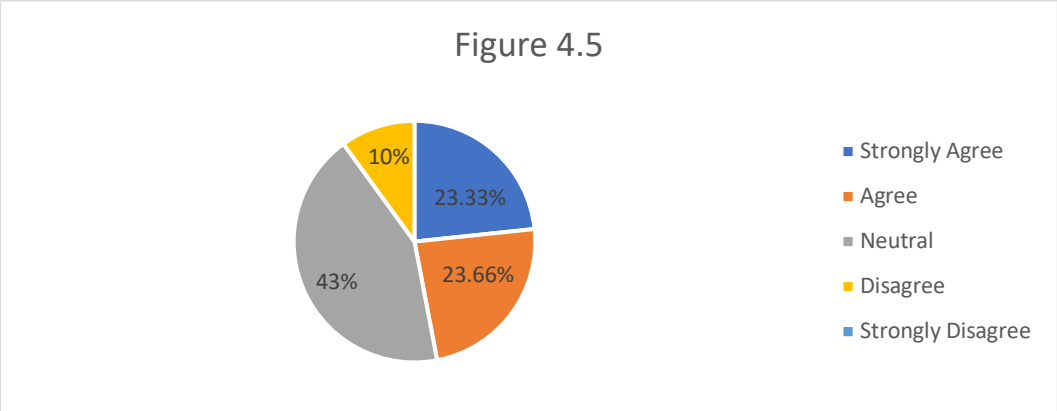

Figure 5

Figure 4.6 "There are challenges and limitations in using AI tools in your studies"

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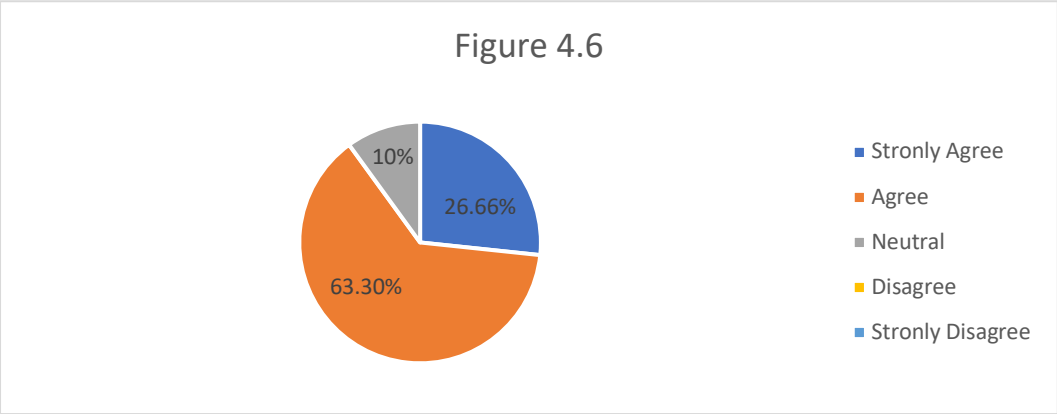

Figure 6

Figure 4.7 "AI provides personalized learning experience"

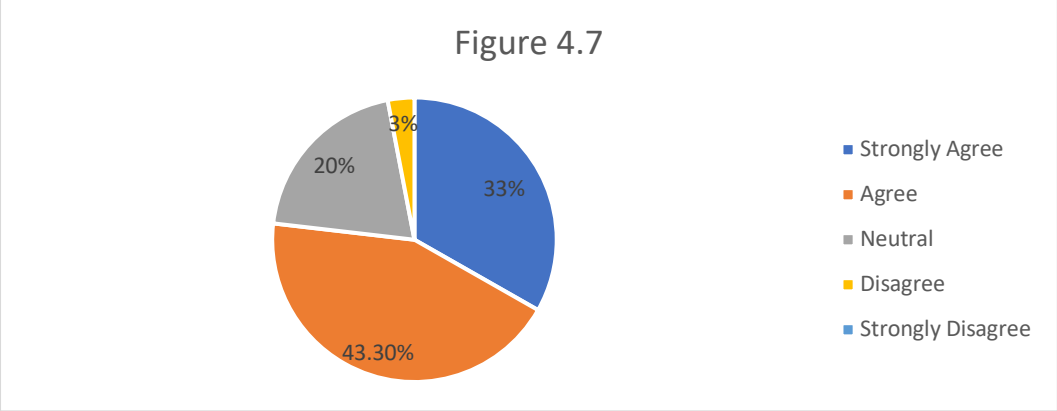

Figure 7

Figure 4.8 "AI can help you for groups and collaborative assignments"

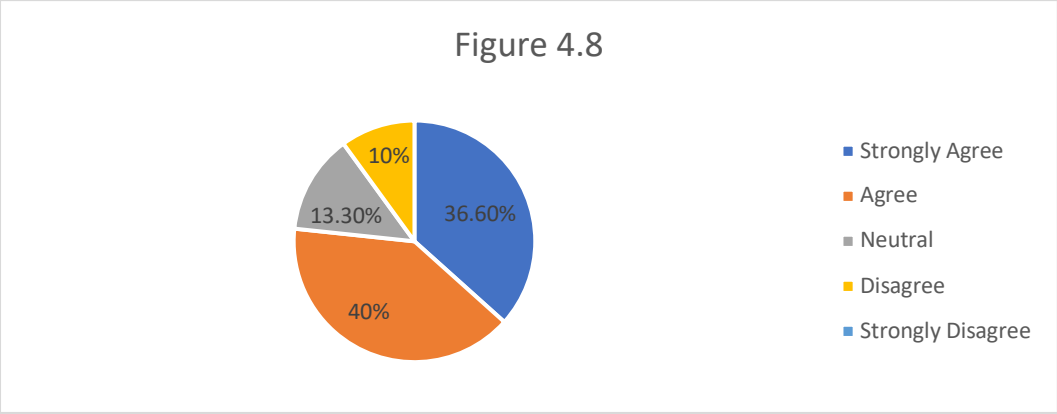

Figure 8

Figure 4.9 "Using AI tools can make you more independent in your studies"

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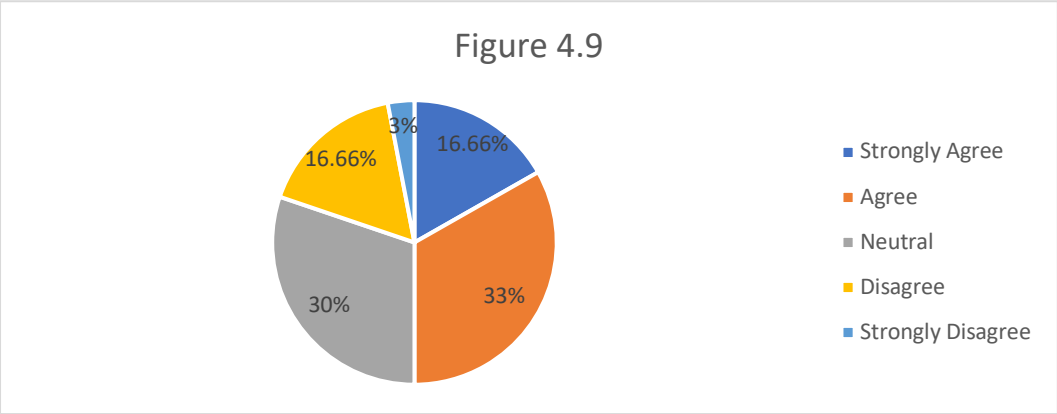

Figure 9

Figure 4.10 "AI can help you stay organized and track your progress"

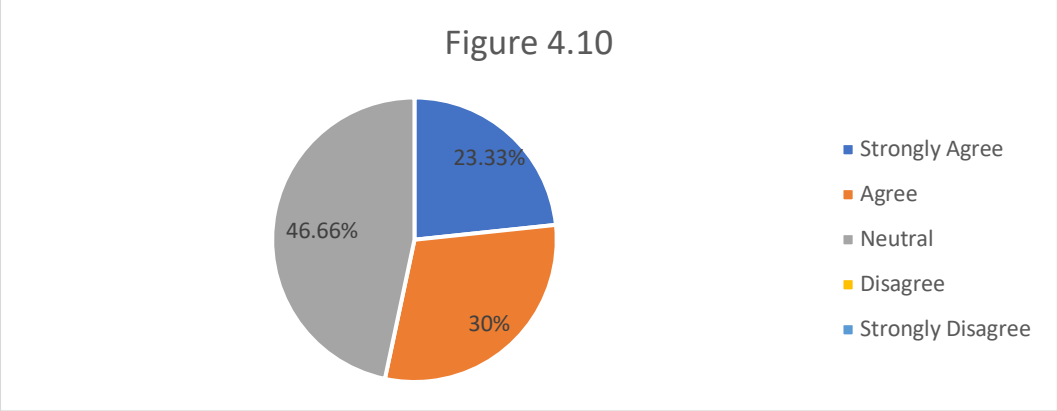

Figure 10

Figure 4.11 "AI tools improve your writing and editing skills"

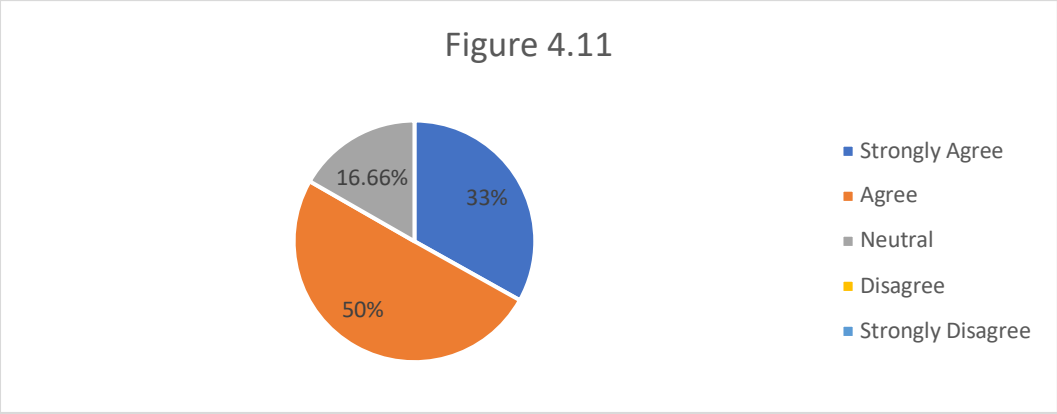

Figure 11

Figure 4.12 "AI tools can affect your learning habits and study patterns"

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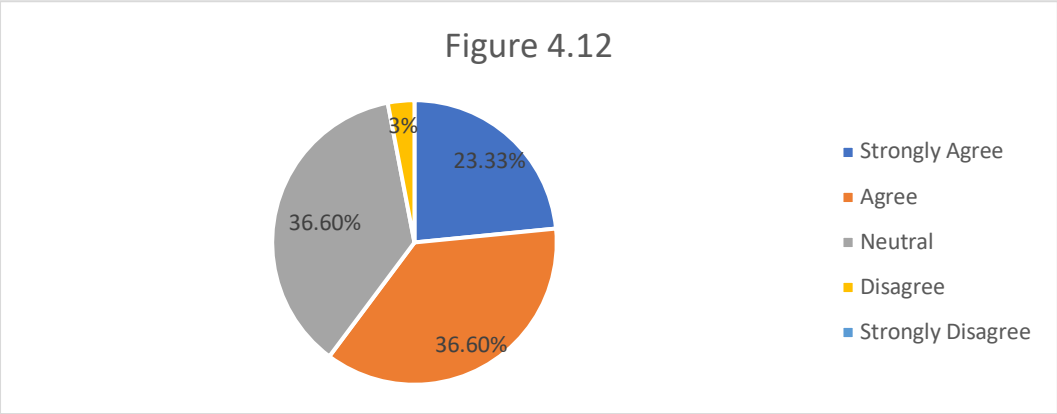

Figure 12

Figure 4.13 "Using AI-based educational tools will feel you more motivated"

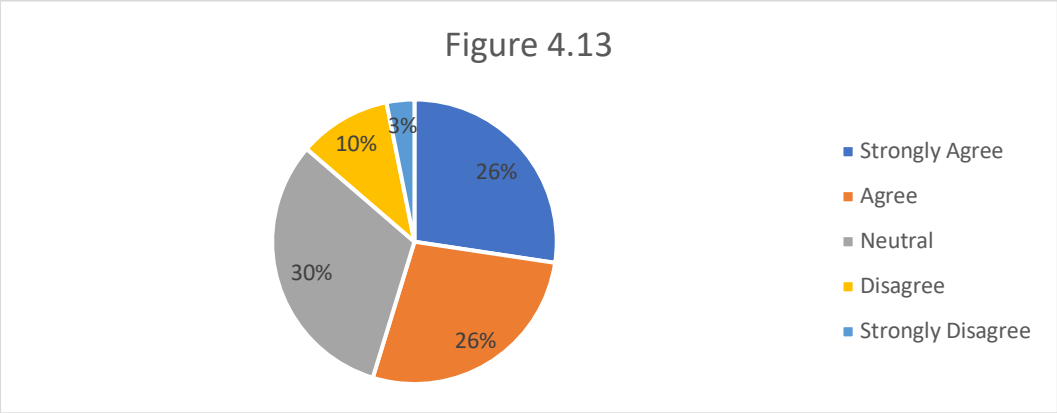

Figure 13

Figure 4.14 "The resources and quality through AI are better than traditional study methods"

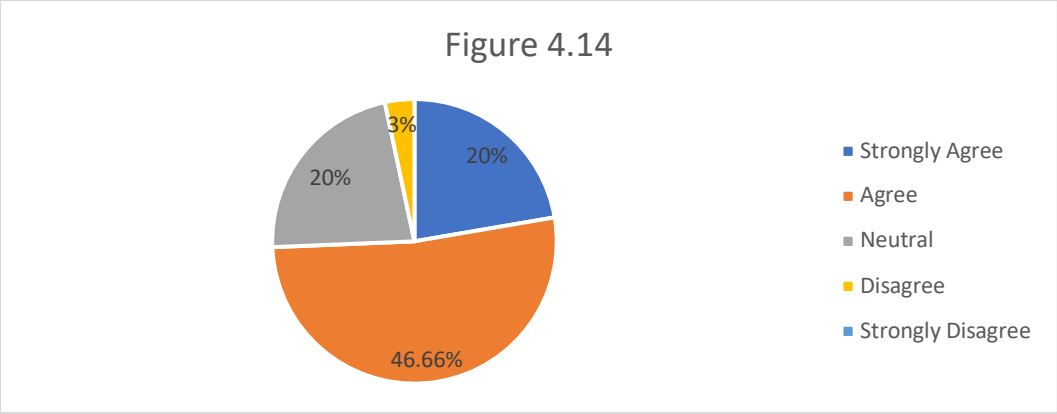

Figure 14

Figure 4.15 "AI tools make learning more engaging and interactive for you"

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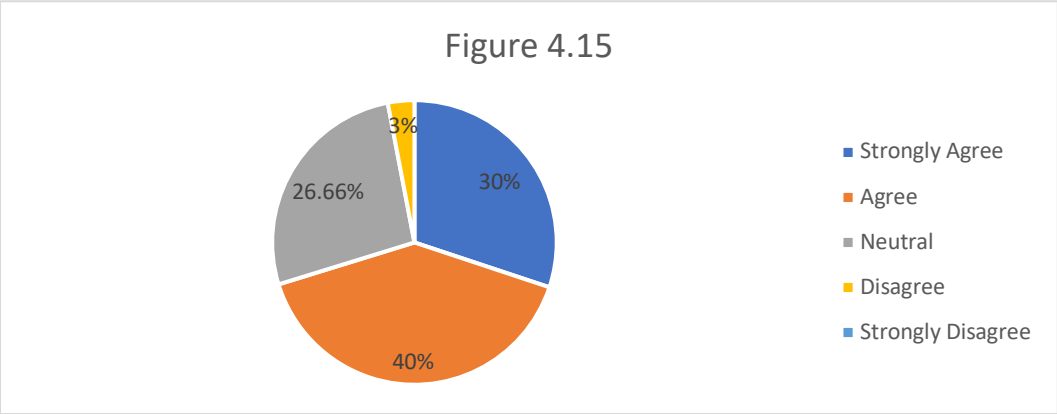

Figure 15

Figure 4.16 "The use of AI tool affected your motivation and engagement in your study"

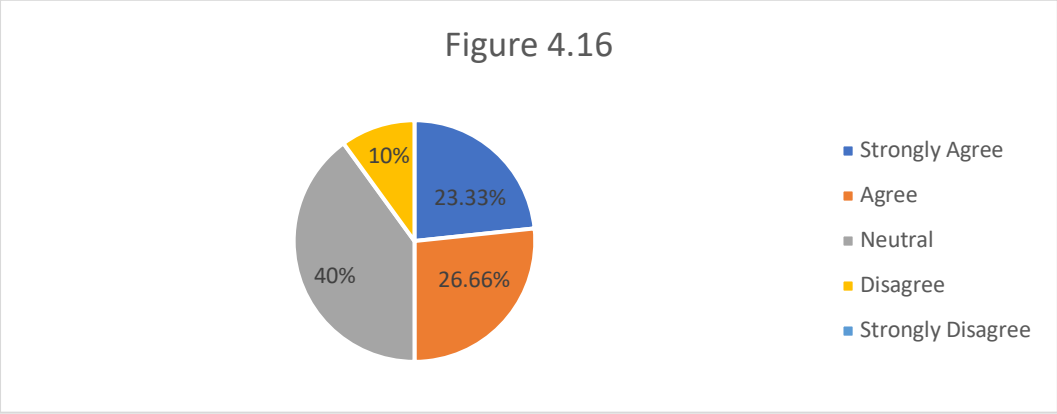

Figure 16

Figure 4.17 "AI are accessible to all students regardless of their technological proficiency"

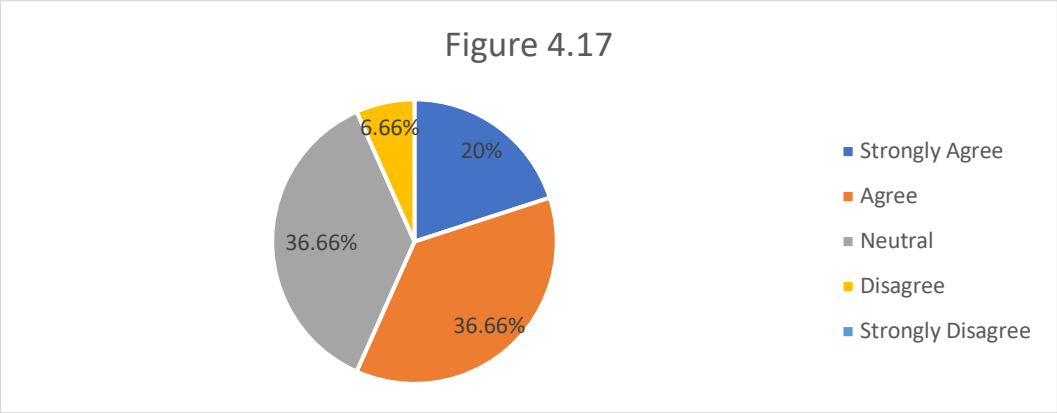

Figure 17

Figure 4.18 "AI integrated your daily study routines"

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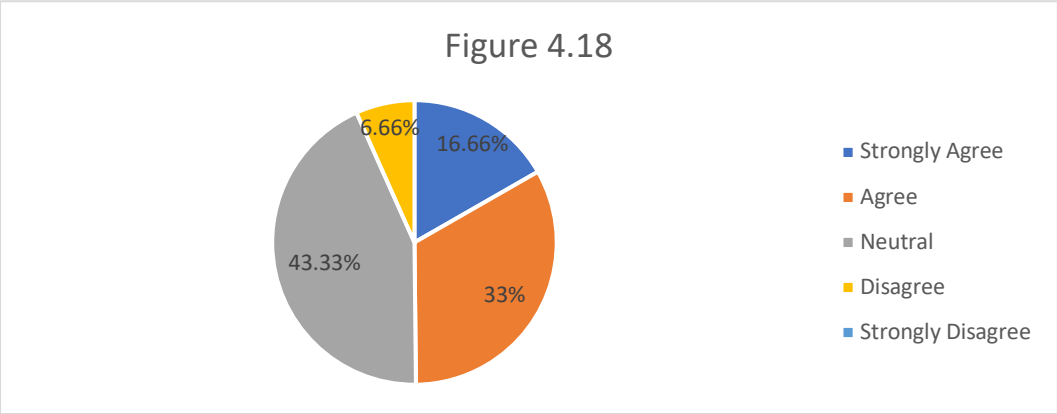

Figure 18

Figure 4.19 "Due to the assistance of AI tools you feel more confident in your academic abilities"

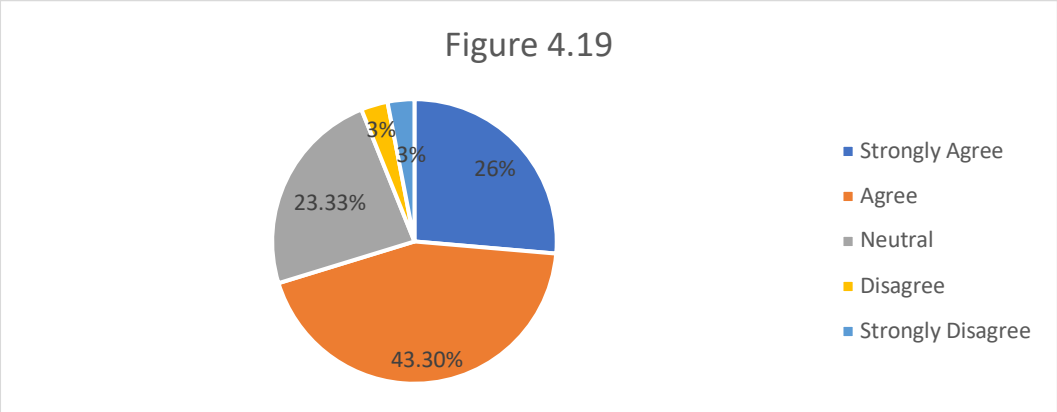

Figure 19

Figure 4.20 "AI tools make learning more enjoyable for you"

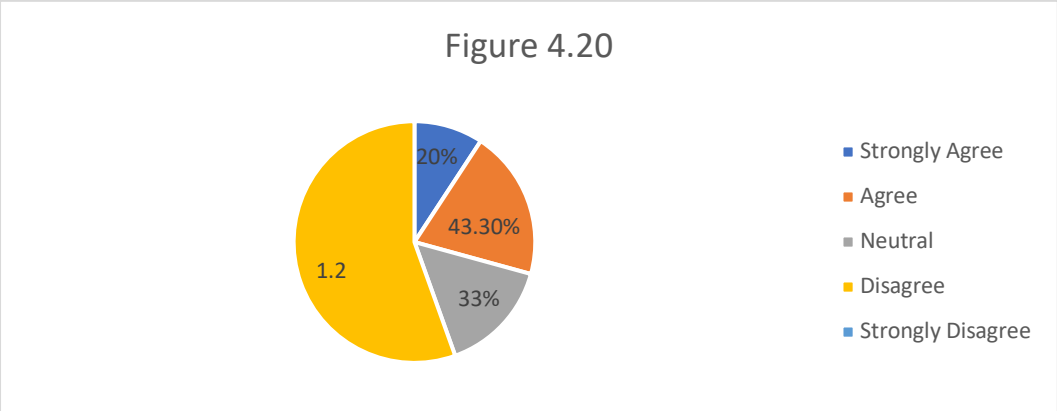

Figure 20

Figure 4.21 "AI helped you maintain or increase your motivation to study"

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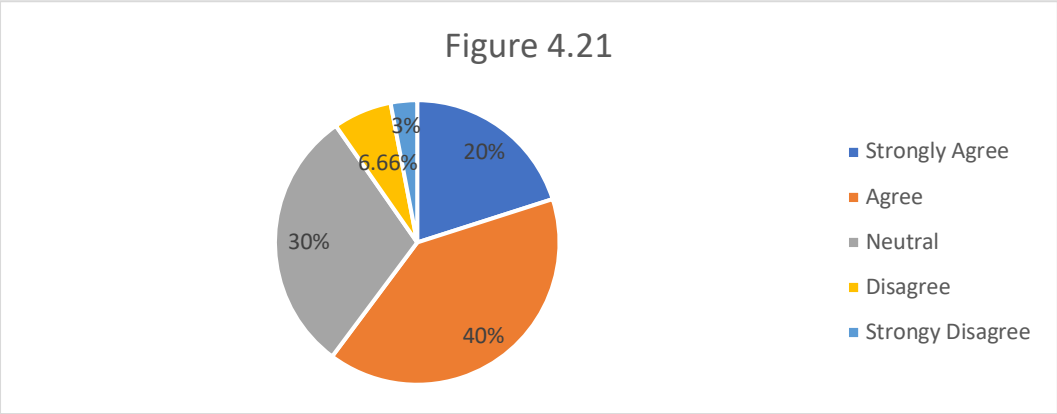

Figure 21

Figure 4.22 "AI application distracts you from your studies"

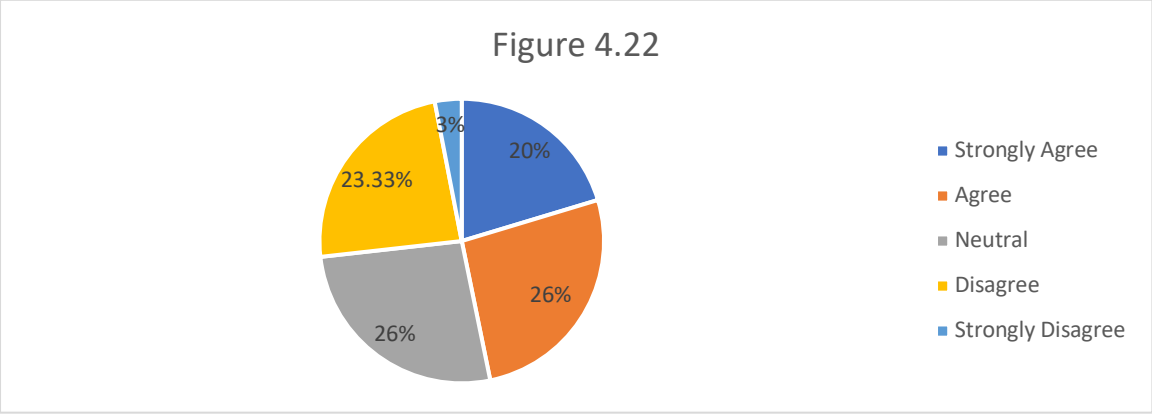

Figure 22

Figure 4.23 "AI tools provide adequate support for your emotional well-being"

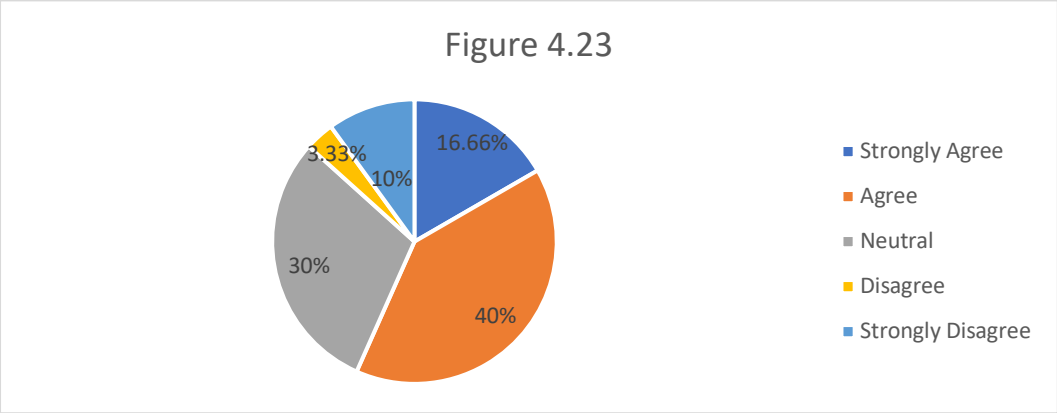

Figure 23

Figure 4.24 "You feel pressured to keep up with AI-driven learning schedules and recommendations"

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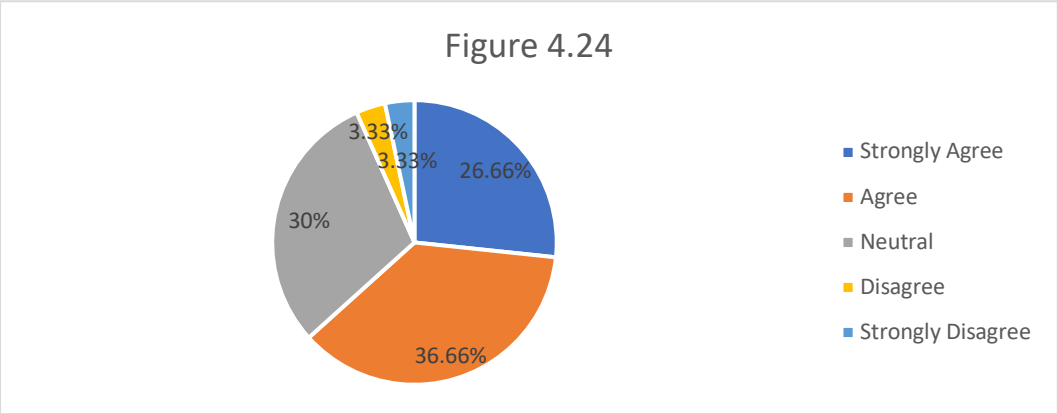

Figure 24

Figure 4.25 "AI tools help boost your confidence in mastering new subjects"

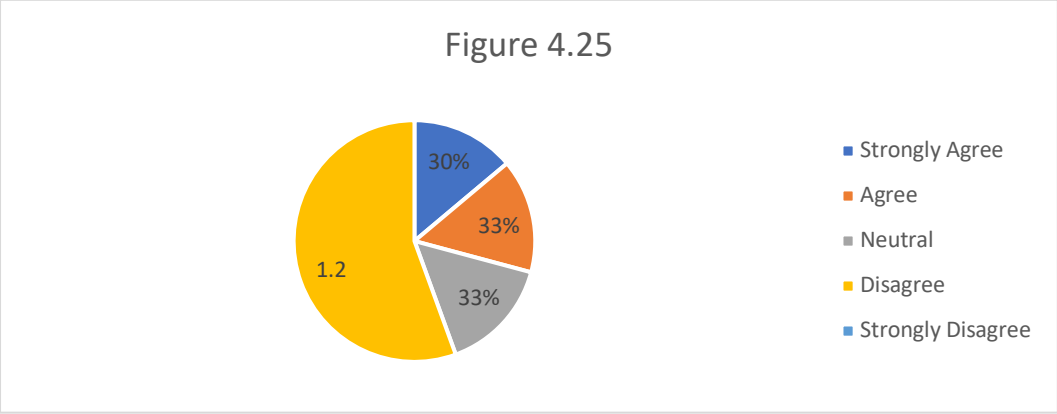

Figure 25

Figure 4.26 "AI tools influence your academic decision-making processes"

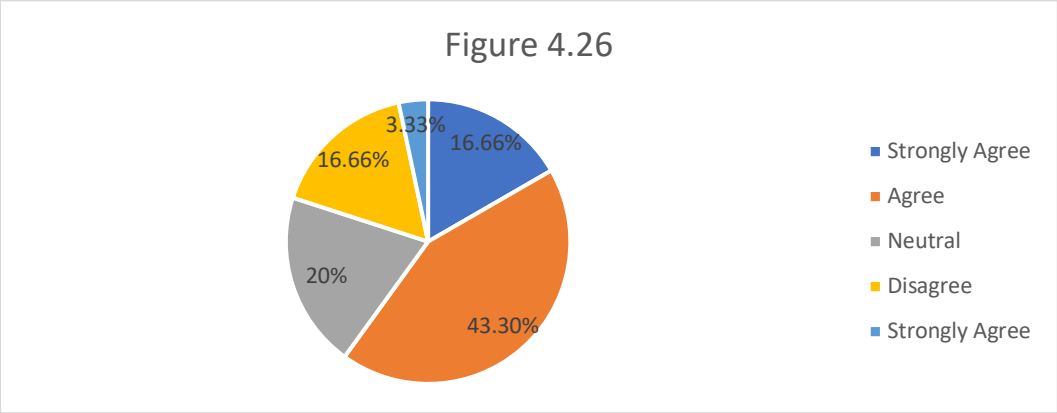

Figure 26

Figure 4.27 "AI helps you stay accountable for your academic responsibilities"

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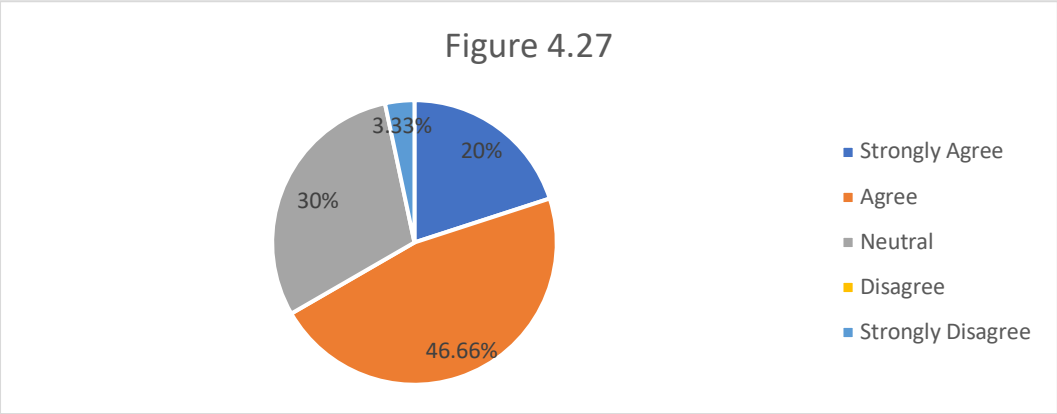

Figure 27

Figure 4.28 "You track your progress towards and goals using AI tools"

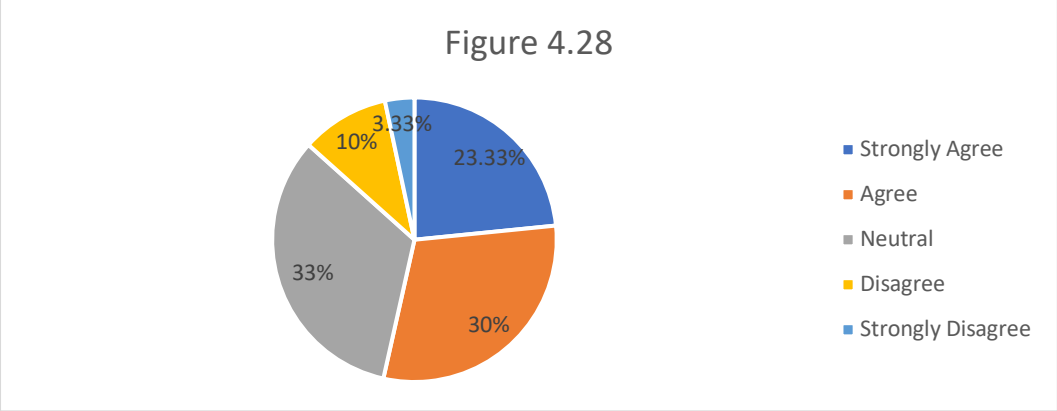

Figure 28

Figure 4.29 "AI tools are beneficial in practicing test or quizzes"

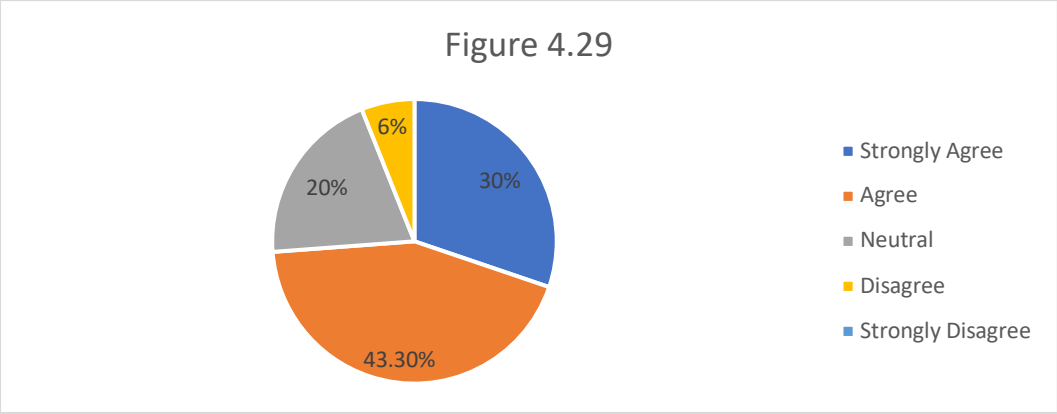

Figure 29

Figure 4.30 "AI can use to manage or enhance your involvement in non-academic pursuits"

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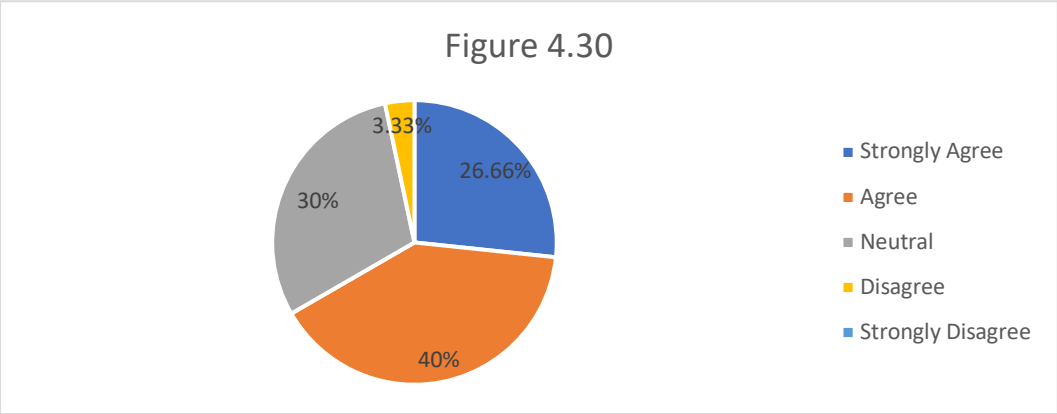

Figure 30

Result

The result of the survey conducted. The study conducted a thorough examination of the views and opinions of 30 students from AMA Computer College Tarlac. The goal was to investigate how artificial intelligence (AI) affects student behavior and academic performance. By interacting with a diverse group of participants, the research aimed to gain a deeper insight into the specific ways AI technologies influence students' learning experiences, their interaction with educational content, and their overall academic achievements. The study gathered both qualitative and quantitative data to offer a comprehensive perspective on the role of AI in shaping the educational landscape at the college.

The survey results across various questions illustrate a broad spectrum of opinions on the role and effectiveness of AI tools in education. The findings reveal a generally positive reception toward AI's potential to enhance understanding of complex concepts, boost critical thinking, and improve learning outcomes. A significant number of respondents recognize AI's ability to offer personalized learning experiences, support group collaborations, and foster academic independence. Additionally, AI tools are perceived to help in staying organized, enhancing writing and editing skills, and making learning more engaging and interactive. Most participants also agree that AI tools can aid in tracking progress towards goals, maintaining academic accountability, and boosting confidence in mastering new subjects.

The survey results reveal a broad and generally positive perception of AI tools among students in their academic endeavors, with a significant majority (83.33%) finding AI particularly beneficial for understanding difficult concepts and enhancing critical thinking, while 66.33% view AI as instrumental in improving critical thinking skills, though 30% remain neutral; moreover, 80% of respondents believe AI provides valuable insights into learning outcomes, and 46.67% consider AI information reliable, despite a mixed response with 43.33% remaining neutral; comfort with relying on AI is split, with 50% comfortable and 43% neutral, indicating varied acceptance; 90% acknowledge the challenges and limitations of AI, and 76.3% find AI offers a personalized learning experience, with 33% strongly agreeing; AI's benefits extend to group work and collaborative assignments (76.6%), but opinions on its role in fostering independence are divided (49.99% agree, 30% neutral); while 53.33% appreciate AI for organization and tracking progress, 46.66% are neutral; a majority (83%) see

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improvements in writing and editing skills due to AI, and 60% note its impact on learning habits, though 36.6% are neutral; AI boosts motivation for 52% of respondents, with 30% remaining neutral, and 66.66% believe AI resources are superior to traditional methods, though 20% are neutral; AI enhances engagement for 70% of students, with 50% reporting positive effects on motivation and engagement, though 40% are neutral; opinions on AI's accessibility are split (56.66% agree, 36.66% neutral), and 49.99% have integrated AI into their study routines, with 43.33% remaining neutral; AI tools increase confidence in academic abilities for 69.3% of respondents, making learning more enjoyable for 63.3%, though 33% are neutral; AI boosts study motivation for 60%, with 30% neutral, but 46% feel it can be distracting, with 26% neutral and 23.33% disagreeing; perceptions of AI's emotional support are mixed (56.66% agree, 30% neutral), and 63.32% feel pressured by AI-driven schedules, with 30% neutral; confidence in mastering new subjects is increased for 63% due to AI, while 33% remain neutral, and 59.96% see AI influencing academic decision-making, with 20% neutral; AI tools are useful for accountability (66.66%) and tracking progress (53.33%), and are particularly beneficial for practicing tests and quizzes (73.3%), with 20% remaining neutral.

We recently conducted a survey focusing on the role of artificial intelligence (AI) and machine learning (ML) in enhancing student outcomes. Our esteemed instructor provided valuable insights, shedding light on how these technologies impact teaching and learning.

SCALE RANGE	EXPLANATION
1.00-1.6	Strongly Disagree
1.7-2.2	Agree
2.3-2.8	Neutral
2.9-3.4	Disagree
3.5-4.00	Strongly Disagree

Table 2

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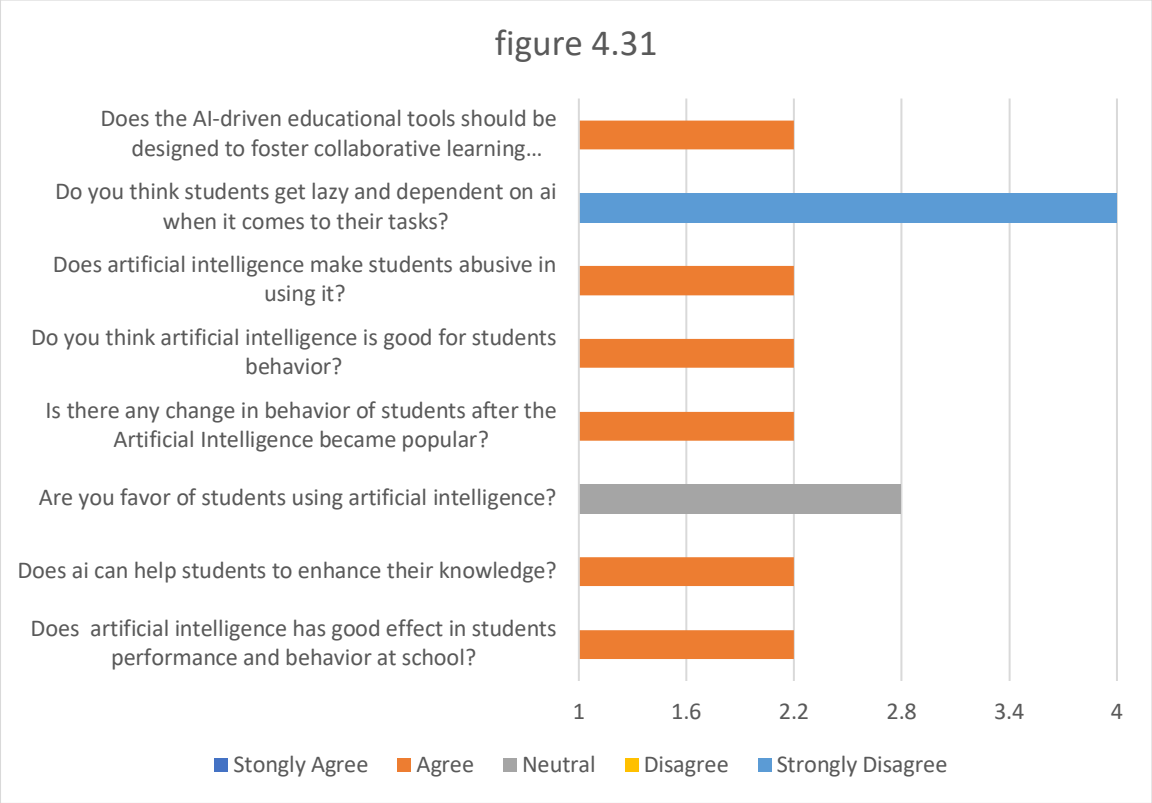

Figure 31

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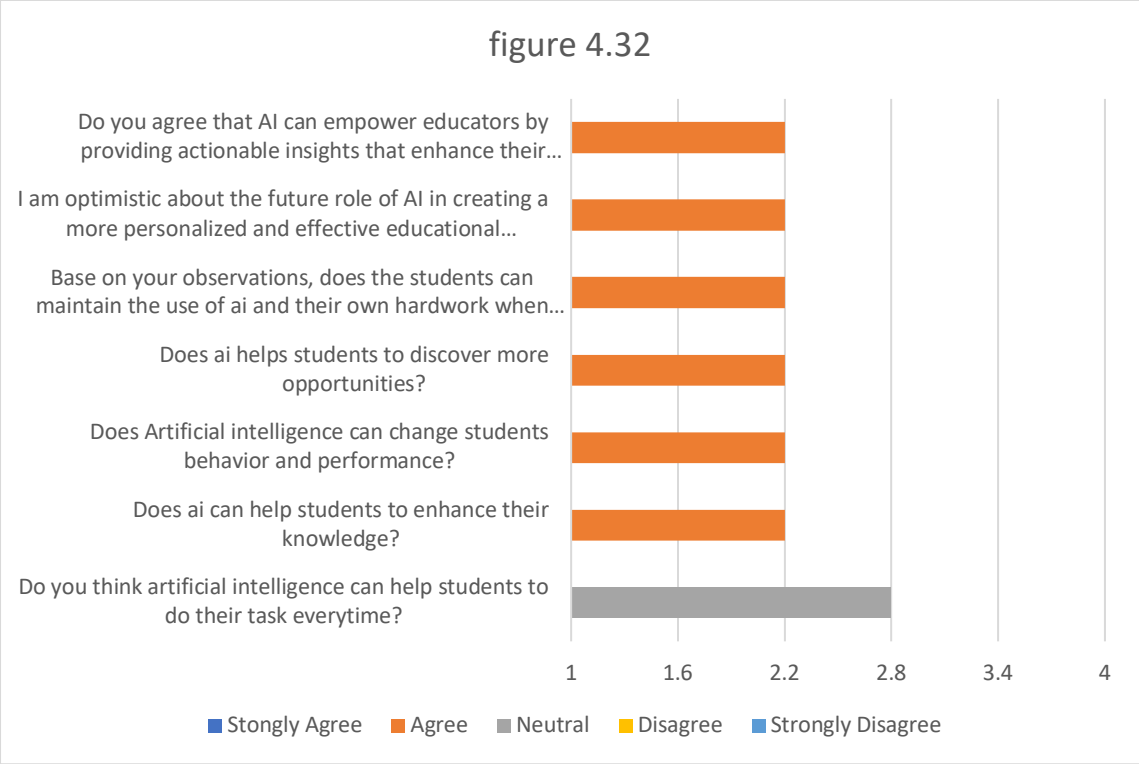

Figure 32

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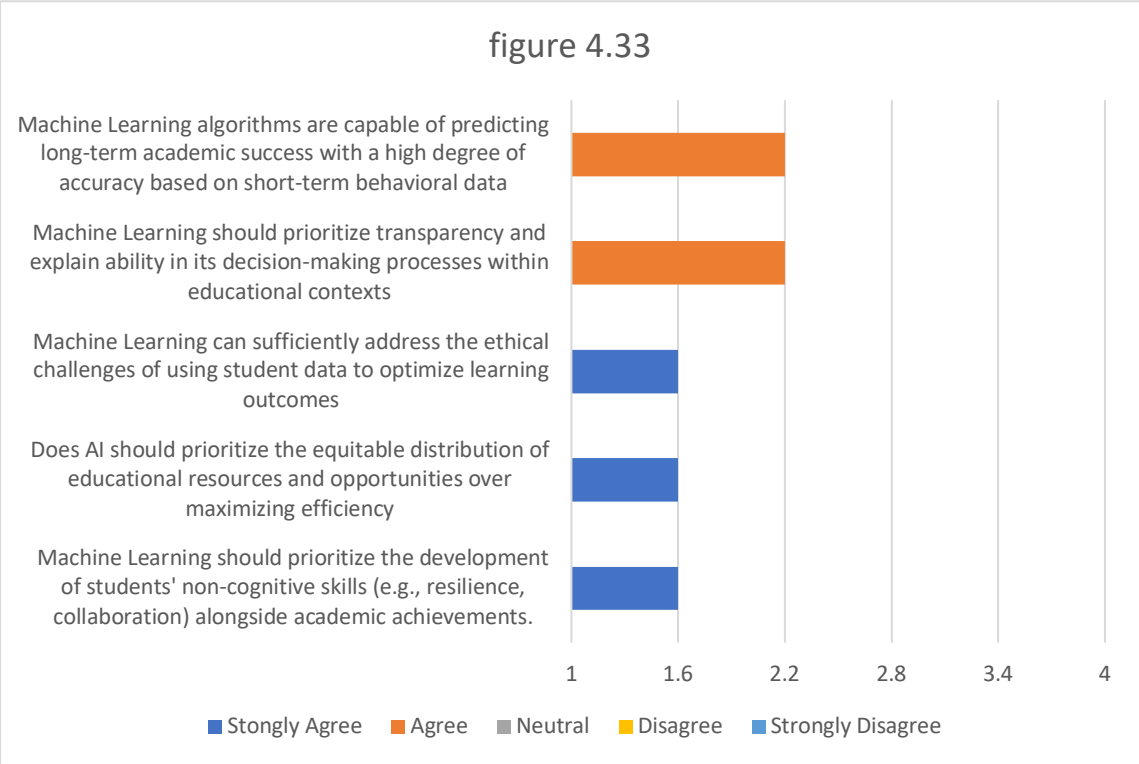

Figure 33

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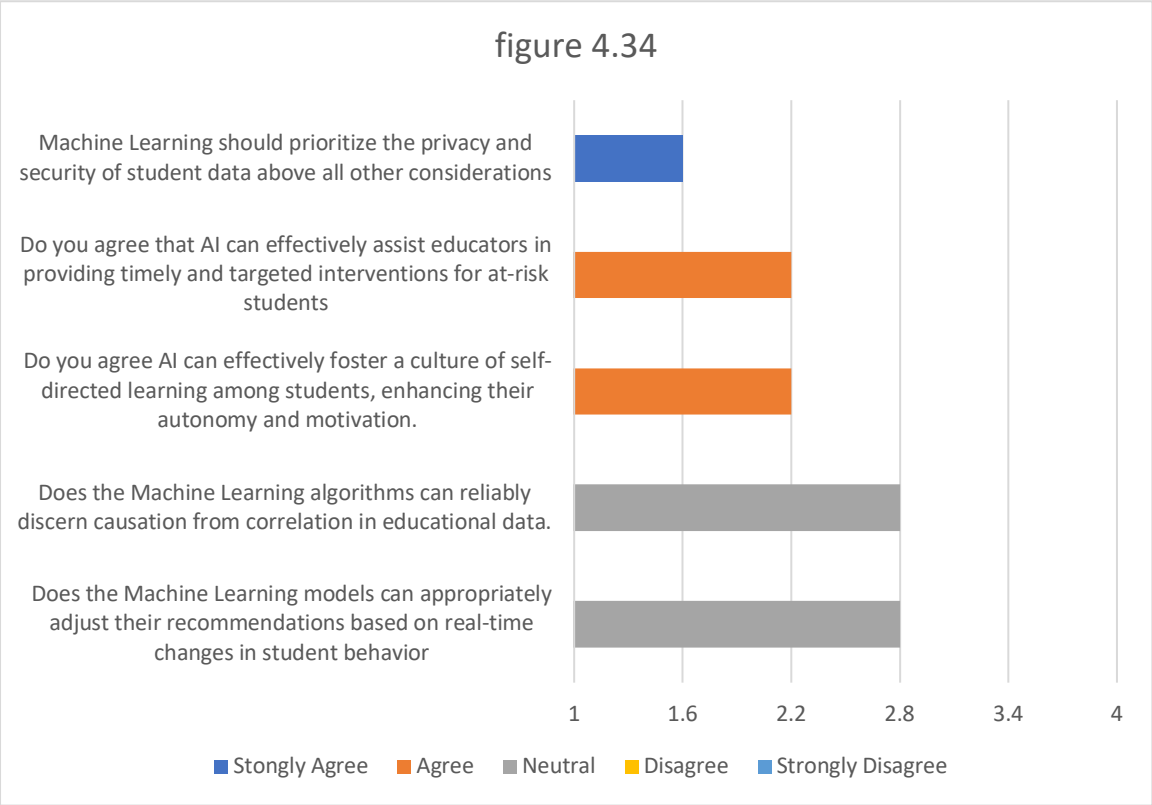

Figure 34

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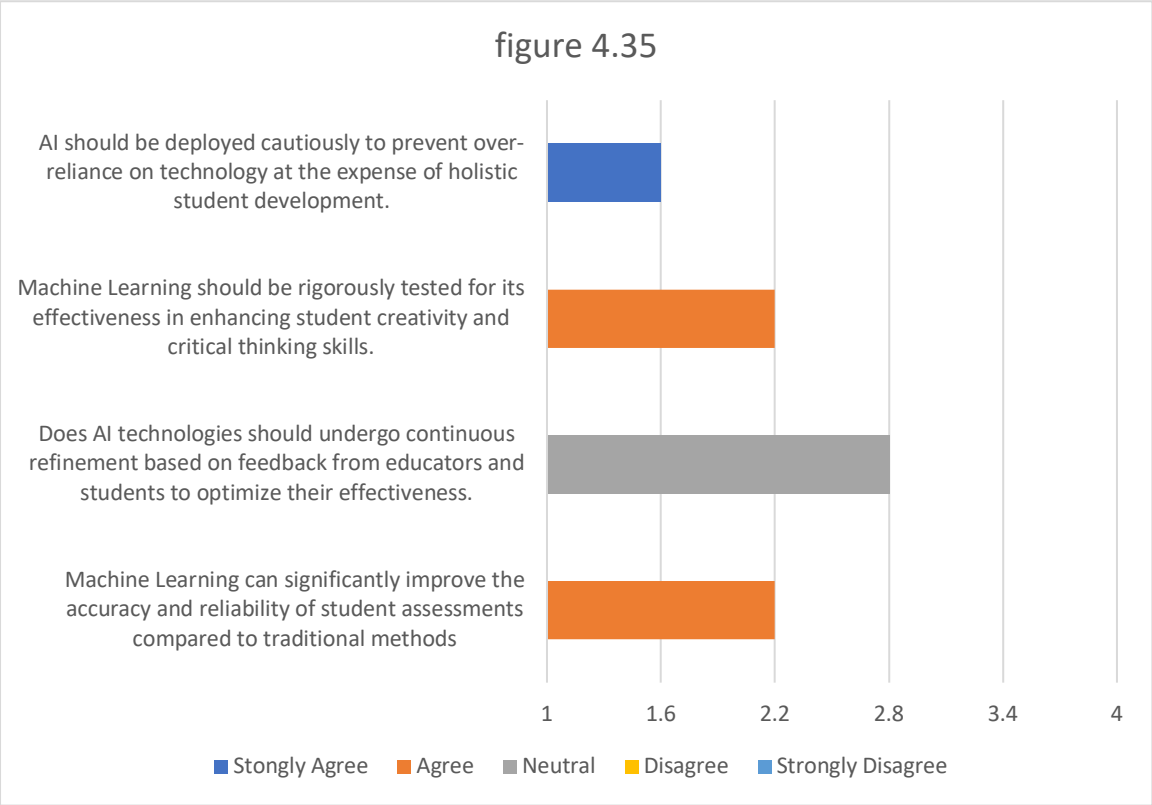

Figure 35

The survey result from Figure 4.31-4.35 responses from Dionisio T. Tabliga, the perception of artificial intelligence (AI) in education among the respondents shows a largely positive outlook, with certain reservations about specific aspects.

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Chapter V
SUMMARY CONCLUSION AND RECOMMENDATIONS

Summary

The data set provided includes responses from various individuals, primarily students, evaluating the effectiveness of AI-based tools in educational contexts. The data comprises responses from multiple students, identified by their names and their year or section in school. Respondents were asked to evaluate several statements regarding AI-based tools, covering areas such as improving understanding of difficult concepts, enhancing critical thinking skills, practicing for tests or quizzes, general perception of AI in education, AI's role in increasing engagement in learning, AI's contribution to personalized learning, AI's potential to reduce study time, and AI tools as a supplementary resource. The responses were categorized into five options: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Regarding the statement that AI-based tools are helpful in improving understanding of difficult concepts, a significant majority of respondents either Strongly Agree or Agree. This indicates a widespread belief in the efficacy of AI tools in simplifying complex topics and enhancing comprehension. A few respondents chose Neutral, suggesting a moderate impact, possibly due to varying experiences or differing levels of exposure to these tools. Notably, no respondents strongly disagreed, which underscores a general acceptance and recognition of the benefits of AI tools in this area.

However, there are notable concerns and areas of skepticism. Numerous respondents recognized challenges and restrictions related with AI tools, counting potential distractions and the pressure to follow to AI-driven plans. Conclusions on the precision and unwavering quality of AI data were blended, with a significant parcel of respondents remaining Neutral. There is also a divide regarding AI's impact on emotional well-being, with some recognizing its benefits while others are doubtful. The idea that AI instruments make learning more pleasant and boost inspiration moreover gotten shifted reactions, with numerous keeping up a neutral stance.

When asked if AI can enhance critical thinking skills, the responses leaned heavily towards Agree and Strongly Agree. This suggests that many students see AI as a valuable tool for fostering analytical thinking and problem-solving abilities. However, some respondents remained Neutral, which might reflect uncertainty or a lack of sufficient interaction with AI tools to form a strong opinion. A small number disagreed, indicating that while the overall perception is positive, there are some who may not have experienced significant benefits in this regard, or who may believe that traditional methods are more effective for developing critical thinking skills.

Most respondents Strongly Agree or Agree that AI tools are beneficial in practicing tests or quizzes. This shows a high level of confidence in AI tools for test preparation, indicating that students find these tools useful for reinforcing knowledge and assessing their understanding of the material. There were also Neutral responses, which could imply that some students may not yet fully trust or rely on AI tools for test practice, possibly due to a preference for traditional study methods or limited experience with AI-based practice tools. Minimal disagreement was noted, suggesting that negative perceptions of AI tools in this context are rare.

The general sentiment towards AI in education is positive, with most respondents agreeing that AI can significantly enhance the learning experience. This reflects a broad acceptance of AI as a beneficial addition to educational practices, with many students recognizing its potential to improve various aspects of learning. Some Neutral responses

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suggest that a portion of the respondents are either undecided or indifferent to AI's role. This could be due to limited exposure to AI tools or a lack of understanding of their capabilities and benefits.

Many respondents believe that AI tools make learning more engaging, with the majority agreeing or strongly agreeing. This indicates that AI tools are seen as effective in making educational activities more interesting and interactive, thereby potentially increasing motivation and participation among students. Neutral responses indicate that some students might not find AI tools particularly engaging, which could be due to personal preferences or varying levels of interactivity and engagement offered by different AI tools.

Respondents largely agree that AI tools can offer personalized learning experiences tailored to individual needs. This suggests that many students appreciate the ability of AI tools to adapt to their unique learning styles and pace, providing a more customized educational experience.

However, a few Neutral and Disagree responses suggest that not all students have experienced personalization to the same extent. This could indicate variability in the effectiveness of different AI tools or differences in how students perceive and utilize these tools.

The majority of responses indicate that AI tools are perceived to help in reducing study time by making learning more efficient. This reflects a belief that AI tools can streamline the learning process, allowing students to grasp concepts more quickly and retain information more effectively. Neutral responses highlight that this benefit might not be universally experienced, possibly due to differences in how students use AI tools or variations in the tools' efficiency.

Most respondents view AI tools as valuable supplementary resources that can support traditional learning methods. The agreement on this statement is strong, with minimal Neutral or Disagree responses, indicating that students generally see AI tools as beneficial complements to conventional educational practices. This suggests that AI tools are widely regarded as useful additions to the educational toolkit, enhancing rather than replacing traditional methods.

Conclusion

The collected responses indicate a predominantly positive perception of AI-based tools among the respondents. Most participants believe that these tools significantly improve understanding of complex concepts, enhance critical thinking skills, and are beneficial for practicing tests or quizzes. The data suggests that AI tools are also seen as effective in increasing engagement, providing personalized learning experiences, and reducing study time. While there are some Neutral and occasional Disagree responses, the overall sentiment is favorable towards the integration of AI in education.

The findings imply that while AI tools are well-received, there is still room for improvement, particularly in ensuring that all students experience the benefits of personalized learning and engagement. The positive reception also highlights the potential for further development and integration of AI-based tools to complement and enhance traditional educational methods.

To maximize the benefits of AI tools in education, it is essential to address the concerns and uncertainties of the respondents who remained Neutral or Disagreed with certain statements. This could involve increasing awareness and understanding of the capabilities of AI tools, providing more opportunities for students to interact with these tools,

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and ensuring that AI tools are designed and implemented in ways that effectively meet the diverse needs of all learners.

Overall, the responses reflect a strong endorsement of AI tools as valuable assets in the educational landscape, capable of enhancing learning experiences and outcomes. As AI technology continues to evolve, its role in education is likely to become even more significant, offering new and innovative ways to support and enrich the learning process.
The survey reveals strong support for using AI tools to enrich educational experiences, particularly in enhancing comprehension, promoting critical thinking, and personalizing learning. Although most respondents value AI's contribution to academic tasks and decision-making, concerns about its limitations and possible distractions are important to consider. This mixed view indicates that while AI holds significant promise for transforming education, its implementation should be carefully managed to ensure it aids rather than hinders learning. Future AI education tools should focus on resolving current issues, improving user experience, and aligning technological progress with educational objectives.

The survey outcomes deliver us a clean photo of ways college students presently view and use AI equipment in their studies. Overall, there's a sturdy tremendous feeling approximately AI's function in enhancing diverse factors of gaining knowledge of, however there also are a few issues and combined opinions. Understanding and Personalization: Most college students recognize how AI equipment assist make complicated principles less difficult to recognize and provide a greater personalized gaining knowledge of experience. This suggests that AI may be very powerful in catering to special gaining knowledge of patterns and supporting college students draw close hard material. Skill Enhancement: Many respondents see AI as a splendid resource for reinforcing vital thinking, writing, and modifying abilities. However, there's an enormous range of people who stay neutral, which shows we want greater studies to absolutely recognize how AI affects those abilities in special situations. Motivation and Engagement: AI equipment is credited with growing motivation and engagement for lots of college students. Still, there are issues approximately ability distractions and the stress from AI-pushed schedules. This shows that even as AI may be motivating, its use wishes to be cautiously controlled to keep away from any terrible effects. Challenges and Limitations: A lot of college students understand that AI equipment includes their very own set of demanding situations and limitations. This highlights the want to deal with those problems to absolutely take benefit of what AI has to provide in education. Mixed Views on Reliability and Integration: There's a cut up in how college students view the accuracy and standard integration of AI equipment into their observe exercises. This suggests we want to maintain comparing and enhancing AI technology to ensure they're powerful and dependable in instructional settings. in conclusion, AI equipment is commonly visible as a precious useful resource for reinforcing gaining knowledge of, boosting motivation, and imparting personalized support. However, we want to focus attention on enhancing the reliability of that equipment, addressing their limitations, and handling their effect on observe exercises and emotional well-being. Ongoing studies and improvement could be critical in ensuring AI is still a beneficial and tremendous pressure in education.

Recommendations

Based on the findings and conclusions of this study on the role of artificial intelligence in optimizing students' performance and behavior, several recommendations can be made to enhance the integration and effectiveness of AI in educational settings.

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Oversight, Education, and Outreach

1. It is essential to continue and expand the dialogue within the educational community about the responsible use of AI technologies. This can include forums, workshops, and conferences that focus on sharing best practices and addressing concerns related to AI in education.
2. Develop and disseminate clear guidelines for educators and administrators on the ethical use of AI tools. These guidelines should address issues such as data privacy, bias in AI algorithms, and the implications of AI on student learning and behavior.
3. Efforts should be made to better define the scope of knowledge and skills that educators need to effectively integrate AI into their teaching. This includes identifying key competencies and providing resources and training to help educators develop these skills.
4. Professional organizations and educational institutions should develop and promote codes of conduct for the use of AI in education. These codes should outline ethical considerations and best practices to ensure AI tools are used responsibly and effectively.

Further Research

1. Conduct research to examine the effectiveness of existing AI tools and programs in enhancing student performance and behavior. This research should identify what works well and what areas need improvement.
2. Extend educational and awareness-raising efforts related to AI in education to include a broader audience, including parents, policymakers, and the general public. This can help build a more informed and supportive community around the use of AI in education.
3. Develop targeted outreach activities to guide the educational community's response to AI-related concerns. These activities should aim to ensure that actions taken by educators and administrators are appropriate and contribute to the responsible use of AI technologies.
4. Conduct additional studies, surveys, and interviews to gather more comprehensive data on the impact of AI on different demographic groups and educational settings. This data can help refine and improve AI tools and their implementation in diverse contexts.

By following these recommendations, educational institutions can better harness the potential of artificial intelligence to enhance student performance and behavior, ultimately leading to improved educational outcomes.

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