People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

University of Chadli Bendjedid-El Tarf

Faculty of Letters and Languages

Department of English

Analysis The Role of Artificial Intelligence in Adaptive Learning

The Case of English Students of Chadli Bendjdid University - El Tarf ,Algeria

Dissertation Submitted in partial fulfilment of the Requirements for the Master Degree in "Didactics of English"

Presented By :

Larabi Khaoula

Mahfoudi Ikram

Supervised By :

Mrs.Sana Bouras

Board of Examiners

Chairperson: Mr Ferrach Wahab	**Chadli Bendjdid University**
Supervisor: Dr. Bouras Sana	**Chadli Bendjdid University**
Examiner: Dr Ouis Hanane	**Chadli Bendjdid University**

Academic Year

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DECLARATION OF AUTHENTICITY

We declare that this research study entitled Analysis The Role of Artificial Intelligence in Adaptive Learning,supervised by Mrs.Sana Bouras in the academic year (2024, 2025),And submitted to the department of English at Chadli Bendjdid University,El Tarf .Candidate for the Master degree has not been published before .Except for the quotations and definitions from various sources that are clearly stated this dissertation was written entirely in my own style and words . We know that plagiarism is unethical and forbidden .We accept complete responsibility for our work .

Signature

Khaoula larabi

Ikram Mahfoudi

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Dedications

"Let us be grateful to the people who make us happy; they are the charming gardeners who make our souls blossom." -Marcel Proust

This work is dedicated to my life model, my superheroes , the king and queen of my life,my Parents, Mr.Larabi Mohammed and Mrs.Mahreya Madar for their endless love, sacrifices and support. No dedication can be eloquent enough to express what they deserve. May God, the almighty, preserve them and their health, a long life, and happiness.

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Thank you all.

Dedications

"Let us be grateful to the people who make us happy; they are the charming gardeners who make our souls blossom." -Marcel Proust

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To all my teachers and whoever taught me a word.

Thank you all.

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List of Abbreviations

AI : Artificial Intelligence

EFL : English as a Foregin Language

H: Hypothesis

Q: Question

% : Percentage

Abstract

The application of artificial intelligence (AI) in education has gained significant traction , particulary in the domain of adaptive learning . This study employs a mixed-method approach to investigate the role of artificial intelligence (AI) in adaptive learning and its impact on personalized learning experiences for students . Among students and teachers of English language Departement at Chadli ben Djdid University . The study addresses two hypotheses. H1:suggests that the use of AI in adaptive learning will result in improved personalized learning experiences for students .While H2:proposes that integrating AI into adaptive learning systems will enhance student engagement and learning outcomes.The research design includes a quantitative research approach .by administering a survey to students and a qualitative research approach by distributing a questionnaire to teachers .The findings from both data collection methods provide comprehensive insights into the effectiveness of AI in adaptive learning and its implications for enhancing students learning experiences .

Keywords : artificial intelligence . adaptive learning . personalized learning .student engagement .learning outcomes.

الملخص

لقد حظي تطبيق الذكاء الاصطناعي في التعليم بجاذبية كبيرة ،خاصة في مجال التعلم التكيفي، تعتمد هذه الدراسة على منهج وصفي لاستكشاف دور الذكاء الاصطناعي في التعلم التكيفي و تأثيره على تجارب التعلم الشخصية للطلاب بين الطلاب و المدرسين في قسم اللغة الانكليزية في جامعة الشاذلي بن جديد .تتناول الدراسة اثنين من الفرضيات ،الاولى تقترح ان استخدام الذكاء الاصطناعي في التعلم التكيفي سيؤدي الى تحسين تجارب التعلم الشخصية للطلاب بينما تقترح الثانية ان دمج الذكاء الاصطناعي في انظمة التعلم التكيفي سيعزز انخراط الطلاب و نتائج التعلم. يتضمن تصميم البحث نهجا كميا، من خلال اجراء استطلاع للطلاب، و نهجا كيفيا ،من خلال توزيع استبيان على المدرسين .تقدم النتائج من كلا الطريقتين في جمع البيانات رؤى شاملة حول فعالية الذكاء الاصطناعي في التعلم التكيفي وتأثيراته على تعزيز تجارب تعلم الطلاب .

الكلمات المفتاحية الذكاء الاصطناعي, التعلم التكيفي, التعلم الشخصي, مشاركة الطلاب ,نتائج التعلم

Chapter one

Introductory Chapter to the Research Problem

Introduction

The field of education in algeria has recently witnessed technological development, especially electronically. It has become necessary to develop the techniques adopted in designing data, learning sources, and the goals that educational institutions seek to achieve, including adaptive learning. The latter is considered one of the most important educational and technological innovations that has become widespread in recent years. due to the slogan of institutions that keep pace with modern technology has become a combination of competition, high quality, and lower cost. The revolution that education is witnessing thanks to smart virtual mentors and responsive learning tailored to the personal size has contributed to improving participation and results, and all of this is enabled by artificial intelligence as one of the systems or Devices that stimulate human intelligence to perform tasks. Which can improve itself based on the information it collects. Adaptive learning, in turn, uses artificial intelligence, which seeks to adapt the learning system to the learner's ability and speed in learning and completing tasks. As a result, this research attempts to analyze the role of artificial intelligence in adaptive learning at Chadli Benjedid University, El Tarf, Algeria.

This chapter is introductory chapter to the research study analyzing the role of artificial intelligence in adaptive learning in educational settings .However, integrating artificial intelligence into adaptive learning has become an interesting and controversial matter, so it was necessary to discover the role of artificial intelligence in adaptive learning

Statement of The Problem

The research gap in Algeria lies in the absence of comprehensive studies and investigations on the role of artificial intelligence (AI) in adaptive learning. Despite the increasing significance of AI in education, there is a lack of research specifically focused on its application and impact in the context of adaptive learning in Algeria. This gap in knowledge limits our understanding of how AI can enhance and personalize the learning experience, adapt to individual students' needs, and improve educational outcomes in Algerian educational settings. Therefore, there is a pressing need for empirical research that explores the potential benefits, challenges, and implications of integrating AI into adaptive learning approaches in Algeria. Addressing this research gap can contribute to the development of effective AI-based educational strategies that cater to the diverse learning needs of Algerian students and promote educational advancement in the country.

The Aims of the Study

The aim of this research is to analyze the role of artificial intelligence in adaptive learning at Chadli Bendjedid University.It seeks to explore the current state of adaptive learning and integration of artificial intelligence in educational settings. And examine the effectiveness of different artificial intelligence techniques in enhancing adaptive learning experiences.

It seeks to identify the contributions and challenges of artificial intelligence as interactive means that facilitate the teaching and learning process. And shed light its impact on personalized learning experiences and students outcomes. By addressing this aims , dissertation aims to explore how artificial intelligence improves adaptive learning and helps create effective strategies for using it in education. And provide insights for implementing artificial intelligence in eeducational contexts.

The Research Questions

The present study attempts to find answers to the following research questions:

Q1: Does artificial intelligence contribute to adaptive learning?

Q2: How does AI affects students' engagement and learning outcomes??

The research Hypotheses

To answers the above questions, we hypothesize the following answers

H1: The use of artificial intelligence in adaptive learning will lead to improved personlized learning experiences for students.

H2: Integrating artificial intelligence into adaptive learning systems will enhance students engagement and learning outcomes.

The significance of the study

This research contribute s to the understanding of the existing of artificial intelligence in the field adaptive learning among chadli ben DJDID University by analyzing the role of artificial intelligence in adaptive learning. The study offers valuable insights about the ability of educational systems to adapt the learning experiences for students by integrating artificial intelligence in this process. The findings can support the students in their learning and help the teachers in their teaching practice and know the weaknesses and the strength points of each student and work on it .this study adds to existing of artificial intelligence in adaptive learning among all English students of chadli ben DJDID University El tarf, algeria.

Research Design

This study is descriptive in nature to describe and analyze the role of artificial intelligence in adaptive learning. It involves analyzing data to gain a comprehensive understanding of the topic by applying a qualitative research design. It focuses on a detailed and accurate description of the subject of the study.

To gather qualitative data, we will conduct an online survey among English language students of chadli Bendjdid university El tarf. The survey will include carefully designed questions that assess their experiences, perceptions, and attitudes towards adaptive learning and the role of artificial intelligence.

we will also incorporate a qualitative method by administering an online questionnaire to teachers. This qualitative data collection will provide valuable insights into the experiences, perspectives, and challenges faced by teachers when integrating artificial intelligence into adaptive learning. The questionnaire will allow teachers to provide detailed responses, enabling us to gain a deeper understanding of their thoughts and opinions.

By applying qualitative method , we aim to obtain a comprehensive understanding of the role of artificial intelligence in adaptive learning. This research design will provide valuable insights into the effectiveness, challenges, and potential benefits of utilizing artificial intelligence in educational settings.

The participants

To achieve the objective of the research, a online survey was administered to the five levels of English department at Chadli Bendjdid University, El Tarf. In addition, the research included applying a questionnaire to English language teachers who are currently teaching at the same university. The inclusion of both students and teachers provides a comprehensive perspective on the issue of analyzing the role of AI in adaptive learning, allowing for a more comprehensive analysis of the contribution of AI to adaptive learning and its outcomes with the participation of students and teachers

Data gathering Tools

To gather data for this study on the role of artificial intelligence in adaptive learning, two data collection tools were employed. Firstly, an online survey was administered to all students at the department of English aiming to optain insights into their experiences, perceptions and attitudes towards adaptive learning and the role of artificial intelligence. This survey provides a valuable information on the impact of artificial intelligence in adaptive learning. Secondly, an online Questionnaire was conducted to teachers to provide us with a deeper understanding of their opinions and thoughts, experiences and challenges facing them when integrating artificial intelligence in adaptive learning.

The structure of the dissertation

The dissertation consists of five chapters starting with the introductory chapter that adresses the research problem. This chapter present research questions, hypotheses and objectives to provide a clear direction for the study. In addition , the chapter discusses the methodology and research design, offering insights into the approach taking to collect and analyze data.this chapter serves as a foundation for the coming chapters, wich explore the finding and detailed analysis.

The second chapter provide a comprehensive review of literature on the role of artificial intelligence in adaptive learning. It explore the historical contexts and key elements related to the contribution of artificial intelligence in adaptive learning and students outcomes and their engagements in educational settings.

The Third chapter focuses on the methodology employed in this research . The chosen approach include a mixed method , qualitative and quantitative to esestablish a deeper understanding of both teachers and students experiences, perspectives and challenges. The research design, data collection instruments, and analytical techniques are discussed in detailed to prove the validity of the study.

Moving to the fourth chapter, the results of the research are presente and interpreted .The findings shed lights on the the impact of integration artificial intelligence in adaptive learning and the adopted techniques and students engagements and outcomes , in addition to teachers experiences and opinions in teaching.

And Finally, the fifth chapter provide a comprehensive discussion on the research findings. It highlights the implications of the study for educational practice including the artificial intelligence in adaptive learning and its importance on both students and teachers and the techniques that used in the education settings.

This chapter also acknowledges the limitations of the study and provide suggestions for future research in this field.

Conclusion

In conclusion, this chapter discussed the aim of the research, research questions, the hypotheses developed to validate or invalidate the findings.as we talked about the significance and the structure of the dissertation.

Chapter Two

Literature Review about Artificial Intelligence and Adaptive Learning.

Introduction

Artificial intelligence (AI) is currently one of the hottest buzzwords in technology, and for good reason. The past few years have seen many innovations and developments that were previously just science fiction slowly becoming reality. Experts consider artificial intelligence to be one of the factors of production, which has the ability to provide new sources of growth and change, such as the change that has occurred in the field of education, especially in adaptive learning, which in turn uses technology of various kinds that contribute to the education process according to the individual characteristics of each student.

Section one: Review Literature on Artificial Intelligence

Definition of Artificial Intelligence:

The definitions of AI have evolved over time due to its modernity and the progression through various developmental stages. It has a rich history, originating from expert systems and advancing to its current state through continuous technological advancements. AI aims to enable computers, computer-controlled robots, or programs to emulate human-like intelligence by studying brain patterns and cognitive processes, leading to the creation of intelligent software and systems.

AI is a diverse area that covers the exploration and creation of systems that can carry out activities usually done by humans, like learning, reasoning, solving problems, perceiving, and processing language (Copeland, 2020; Russell & Norvig, 2020).

AI, as defined by the Association for the Advancement of Artificial Intelligence (AAAI), involves examining entities that receive information from their surroundings and carry out actions (AAAI, n.d., para. 1).

Advantages of Artificial Intelligence in Education

AI possesses the potential to transform the educational process through personalized and adaptive learning experiences, improving accessibility and enhancing educational outcomes. Here are some advantages of AI in learning:

1. Customized Learning: AI has the capability to tailor learning experiences to individual students' requirements, preferences, and learning styles, resulting in more effective learning (Popenici & Kerr, 2017). Adaptive learning systems powered by AI can modify content, speed, and complexity based on the student's performance and comprehension (Khamparia & Pandey, 2017).
2. Smart Tutoring Systems: AI-driven intelligent tutoring systems offer immediate feedback, personalized assistance, and focused support to students, emulating a human tutor's role (Kulik & Fletcher, 2016). These systems can identify student misunderstandings and deliver personalized interventions to address them (Khamparia & Pandey, 2017).
3. Automated Grading and Evaluation: AI streamlines the grading and evaluation process, lessening the burden on educators and offering timely feedback to students (Renz et al., 2020). AI-based essay grading systems can assess written assignments objectively and consistently (Shermis & Burstein, 2013).
4. AI-driven educational tools can improve accessibility for students with various learning needs, including disabilities or language obstacles (Popenici & Kerr, 2017). Additionally, AI-based translation and speech recognition technologies support communication and learning for students with hearing or visual impairments (Khamparia & Pandey, 2017).
5. AI has the capability to examine extensive datasets on student performance, engagement, and learning trends, offering valuable insights to educators and administrators for informed decision-making and the enhancement of educational practices (Renz et al., 2020).

Disadvantages of Artificial Intelligence in Education

The primary disadvantages of employing artificial intelligence (AI) in education include:

- Limited human interaction: AI does not provide the customized attention and emotional support that human teachers do, which are critical for effective learning (Popenici and Kerr, 2017).

– Data biases: AI systems rely largely on the quality of their training data, which might inject errors or biases into their results (Mehrabi et al., 2021).

– Privacy and security risks: The application of AI in education may raise privacy and security concerns due to the collecting and possible misuse of students' personal information (Lakhani & Rub, 2020).

- High expenditures: Creating and implementing AI systems in education can be expensive, providing financial issues for schools and people (Zawacki-Richter et al. 2019).
- Ethical considerations: Integrating AI in schooling may increaseethical dilemmas like perpetuating biases or infringing on human autonomy (Floridi et al., 2018).

The Importance of AI in Education

AI has the potential to transform education by offering personalized learning experiences, interactive lessons, and support for administrative tasks, opening up a world of possibilities.

- Automation of administrative tasks in education: AI can assist in various non-academic responsibilities like grading, feedback management, enrollment coordination, course management, and HR tasks.

- Development of intelligent educational content: AI can digitize content such as instructional manuals, video lectures, and conferences, enabling customization for different student levels with features like animations and educational materials. Additionally, AI facilitates a rich learning environment through audio and video summaries and integrated lesson plans.

-Voice assistance allows students to access extra learning materials and support independently, reducing the need for printed materials and offering solutions to common questions.

-personalized learning involves detailed student data tracking and the creation of schedules, lesson plans, reminders, and study guides using advanced AI technologies .

(Kalyani, 2023).

Examples of AI Applications in Learning :

• AI writer, writeless.AI: These applications support students in their writing tasks.

• QUILLBOT: It's an AI-powered tool that helps students rephrase and enhance the clarity of their writing.

• Claude: Assists students with oral practices.

• Chatgpt: Enables students to engage in human-like conversations for various tasks such as answering questions and aiding in writing tasks like emails, essays, and code. It's currently accessible to the public for free.

• Moodle and Blackboard: These are Learning Management Systems (LMS) used for online and blended learning. Moodle is customizable and open-source, while Blackboard offers a range of features.

The Role of Artificial Intelligence in Education

Artificial intelligence (AI) is becoming more common in educational environments, providing fresh methods to customize learning, enhance student involvement, and aid educators (Popenici & Kerr, 2017). AI holds the promise to revolutionize education with tools like smart tutoring systems, automated assessment and feedback, virtual teaching aides, and adaptable learning platforms.

One key use of AI in education involves intelligent tutoring systems, employing AI algorithms to offer tailored guidance and feedback to students based on their unique learning requirements and progress (Chassigneux et al., 2018). These systems adjust the speed, content, and teaching methods for each student, resembling the individualized tutoring experience. Studies indicate that intelligent tutoring systems can notably enhance student learning results in contrast to conventional classroom teaching (Kulik & Fletcher, 2016).

AI is also utilized for automated assessment and feedback, enabling teachers to promptly evaluate student assignments and offer comprehensive feedback (Riordan et al., 2019). AI-driven writing tools can evaluate student essays and offer guidance on grammar, organization, and substance, aiding students in enhancing their writing abilities (Woods et al., 2017).

AI-driven virtual teaching aides can offer students instant assistance by responding to queries and providing guidance on course content (Chassigneux et al., 2018). These assistants not only support educators by reducing their workload but also provide students with immediate help.

AI-powered adaptive learning platforms utilize algorithms to customize the learning journey for each student according to their unique strengths, weaknesses, and learning styles (Oxman & Wong, 2014). These platforms can dynamically modify the course material's content, speed, and delivery, guaranteeing that students receive personalized instruction.

Indeed, as AI gains more traction in education, there are legitimate concerns regarding privacy, bias, and its impact on educators (Popenici & Kerr, 2017). It's vital to address these issues and guarantee that AI is employed in a responsible and ethical manner within educational settings as technology advances.

The Use of AI in Enhancing Personalized Learning

AI in education has the power to transform personalized learning for students by customizing content and delivery based on individual learning patterns and strengths. This tailored approach can boost student engagement, motivation, and academic success (Chassignol et al., 2018).

A key use of AI in personalized learning is through intelligent tutoring systems (ITS). These systems utilize AI algorithms to track a student's advancement, pinpoint challenging areas, and offer personalized feedback and assistance (Kulik & Fletcher, 2016). By constantly evaluating and adjusting to the learner's requirements, ITS can establish a more productive and proficient learning setting.

AI-driven adaptive learning systems are increasingly popular in schools. These platforms use machine learning to analyze student information like test scores, learning preferences, and participation levels. This data is then used to adapt the content, speed, and format of educational materials in real-time (Bodily et al., 2017). This customized method can effectively target individual learning weaknesses and provide each student with a personalized educational journey.

Moreover, AI can aid in crafting personalized learning routes and educational plans. Through evaluating student interests, strengths, and future goals, AI systems can suggest appropriate courses, educational materials, and additional activities (Chassignol et al., 2018). This data-centric strategy enables students to actively influence their educational path and pursue their interests more efficiently.

While AI shows great promise in personalized learning, it's vital to tackle ethical issues like safeguarding data privacy, addressing algorithmic biases, and avoiding excessive dependence on AI systems (Zawacki-Richter et al., 2019). Continuous research and cooperation among educators, tech experts, and policymakers are key to guaranteeing the responsible and efficient use of AI in education.

Section two: Review Literature on Adaptive Learning

Definition of Adaptive Learning:

It's like customizing how students learn based on their own requirements, likes, and how well they understand the material. The goal is to offer personalized learning that suits each student's specific skills and learning speed.

It's kind of like when computers use algorithms to tailor how students learn, offering them personalized resources and activities to meet their specific needs (Truong, 2016, p. 1).

It's like tailoring how students learn based on their individual needs, skills, and preferences by adjusting the content, order, and delivery of teaching materials (Oxman & Wong, 2014). It utilizes computer algorithms and AI to analyze students' performance data and offer personalized learning experiences (Truong, 2016). The objective of adaptive learning is to enhance learning efficiency and effectiveness by providing content that is appropriately challenging, improving engagement, motivation, and subject mastery (Park & Lee, 2004).

Advantages of Adaptive Learning

Adaptive learning, a personalized educational approach, brings several advantages over conventional teaching methods. It provides a customized learning journey where the material, pace,

and difficulty are tailored to suit the individual needs, abilities, and learning preferences of each student (Oxman & Wong, 2014). This individualized technique ensures that learners receive guidance aligned with their current knowledge and proficiency, resulting in enhanced understanding and memory of the content (Truong, 2016).

By offering a tailored learning experience, adaptive learning platforms can boost student engagement and motivation (Natriello, 2017). When students encounter material that is suitably challenging and aligns with their interests and aspirations, they are more inclined to stay engaged and motivated during their learning journey (Pane et al., 2017).

Maximizing Time and Resources: Adaptive learning platforms efficiently utilize time and resources by pinpointing and tackling knowledge gaps or weak areas more effectively (Oxman & Wong, 2014). This focused strategy avoids unnecessary repetition of material that students have already mastered, enabling a more effective utilization of instructional time and resources (Truong, 2016).

Immediate Feedback and Ongoing Evaluation: Adaptive learning platforms offer instant feedback and continuous assessment, enabling prompt detection of areas where students might require extra assistance or reinforcement (Pane et al., 2017). This continual monitoring and feedback cycle assist students in staying on course and adapting their learning approaches as needed (Natriello, 2017).

Enhanced Learning Results: Through customizing teaching to unique requirements and offering specific feedback, adaptive learning systems have proven to enhance learning outcomes and academic achievements (Oxman & Wong, 2014; Truong, 2016). Students who experience personalized instruction are more inclined to master the subject matter and exhibit elevated levels of success (Pane et al., 2017).

In conclusion , adaptive learning provides various benefits for students, such as personalized learning experiences, heightened engagement and motivation, effective time and resource utilization, immediate feedback, and enhanced learning results. By utilizing technology and data-driven methods, adaptive learning platforms have the potential to transform the delivery of education and enrich the learning journey for students across different age groups and skill levels.

Disadvantages of Adaptive Learning

Adaptive learning technology in the field of education has been increasingly popular lately, offering customized and individualized learning experiences for students. Nevertheless, similar to any educational method, it has its own drawbacks and constraints.

One major issue with adaptive learning involves the risk of algorithmic bias (Zawacki-Richter et al., 2019). The algorithms in adaptive learning platforms are programmed to detect patterns and forecast based on student data. Yet, these algorithms may uphold current biases or introduce new ones, resulting in unjust treatment or incorrect evaluations of students' capabilities (Bulger, 2016).

Another drawback of adaptive learning is the risk of oversimplifying intricate learning processes (Khosravi et al., 2020). Adaptive systems frequently depend on preset routes and predefined educational goals, which might not fully encompass the intricacies and complexities of human learning. This could result in a simplified method that overlooks the multifaceted aspects of acquiring knowledge and developing skills.

Furthermore, adaptive learning platforms heavily depend on gathering and analyzing data, which brings up worries regarding privacy and data security (Zawacki-Richter et al., 2019). These systems collect and analyze students' personal details, learning patterns, and performance data, posing potential risks of data breaches or inappropriate use (Bulger, 2016).

Moreover, incorporating and upkeeping adaptive learning platforms can incur significant expenses and demand substantial resources (Khosravi et al., 2020). Schools and colleges might encounter difficulties related to infrastructure, technical know-how, and continuous assistance, which could restrict the availability and expandability of these systems, especially in financially limited or resource-restricted settings.

Lastly, adaptive learning systems might not cater to every learning style or subject area (Zawacki-Richter et al., 2019). Some students could favor conventional, teacher-centered methods, and specific subjects or fields may not align smoothly with adaptive learning techniques, which could restrict the efficiency and suitability of these systems.

In conclusion, although adaptive learning shows potential for improving educational experiences, it's crucial to recognize and tackle its possible downsides. It's important to address algorithmic biases, maintain the nuances of human learning, safeguard data privacy, handle expenses and resources, and understand the constraints of adaptive systems in specific situations.

Categories of Adaptive Learning

1. Personalized Content Delivery: This aspect involves customizing how educational materials are presented to align with the learner's knowledge, learning style, and pace. For instance:

- Tailoring the sequence of instructional content to match the learner's progress and comprehension (Paramythis & Loidl-Reisinger, 2004).

- **Customized Navigation**: Offering individualized paths and suggestions for learners based on their advancement and requirements (Brusilovsky, 2001).

2. Personalized Feedback and Assistance: These strategies include offering interactive feedback, guidance, and assistance tailored to the learner's performance and needs:

- Smart Tutoring Systems: Delivering personalized tutoring, tips, and clarifications depending on the learner's understanding and misconceptions (Corbett et al., 1997).

- Tailored Scaffolding: Adapting the support and guidance level provided to learners based on their performance and comprehension (Luckin & du Boulay, 1999).

3. Tailored Assessment and Evaluation: These methods involve customizing assessments and evaluations to match the learner's abilities and advancement:

- Personalized Testing: Adapting the difficulty level and order of test items based on the learner's performance (Wainer et al., 2000).

- Personalized Feedback for Assessments: Offering individualized feedback and support based on the learner's performance in assessments (Shute, 2008).

4. Personalized Learning Paths and Recommendations: These approaches include suggesting tailored learning paths, resources, and activities based on the learner's interests, objectives, and performance:

- Customized Course Suggestions: Recommending courses or learning materials that suit the learner's requirements and preferences (Khribi et al., 2015).

- Personalized Learning Routes: Designing individualized learning paths and sequences based on the learner's progress, objectives, and preferences (Oxman & Wong, 2014).

The Strategies of Adaptive Learning

Adaptive learning in education customizes the learning process to suit each student's unique requirements, skills, and interests. This method utilizes a range of techniques to improve learning results and support individualized teaching.

1/ Ongoing Evaluation and Data-Driven Customization:

Adaptive learning platforms continually evaluate students' progress and collect data on their strengths, weaknesses, and learning behaviors (Oxman & Wong, 2014). This information is then utilized to personalize the learning material, speed, and teaching approaches to suit each student's specific requirements (Truong, 2016).

2/ Competency-Based Advancement:

In adaptive learning, students advance through the content at their individual pace, moving on only after mastering the current concept or skill (Oxman & Wong, 2014). This method ensures that students establish a strong foundation before progressing to more advanced topics (Truong, 2016).

3/ Tailored Learning Routes:

Adaptive learning systems generate personalized learning paths for each student based on their prior knowledge, learning preferences, and performance data (Oxman & Wong, 2014). These individualized pathways offer customized content, tasks, and assessments to support unique learning journeys (Truong, 2016).

4/ Diverse Content Presentation:

Adaptive learning platforms often present content in various formats like text, videos, simulations, and interactive exercises to accommodate different learning styles and preferences (Oxman & Wong, 2014). Students can engage with the material in the format that aligns with their needs (Truong, 2016).

5/ Instant Feedback and Support:

Adaptive learning systems offer prompt feedback and tailored support to address specific areas of difficulty or misunderstandings for students (Oxman & Wong, 2014). This immediate assistance assists students in recognizing and resolving learning obstacles in real-time (Truong, 2016).

Examples of the Application of Adaptive Learning in Classrooms

Adaptive learning has garnered considerable interest in the education sector because of its ability to customize the learning journey for each student. This method adjusts the educational material, order, and teaching techniques according to the student's requirements, choices, and progress.

1. Mathematics Adaptive Learning Study:

Researchers have delved into the effectiveness of adaptive learning platforms in math education. For example, Mavroudi, Giannakos, and Krogstie (2018) examined the impact of an adaptive learning system on student performance in a math course. Their results indicated that these systems could boost student engagement and academic success through personalized learning paths and immediate feedback.

2. Language Learning Adaptive Approach:

Adaptive learning has also been implemented in language learning settings. Iglesias, Anido, and Fernandez-Iglesias (2021) created an adaptive learning system for English as a Foreign Language (EFL) instruction. The system used learner profiles, learning styles, and performance data to adjust content and teaching methods, leading to enhanced language skills and motivation in students.

3. STEM Education Adaptive Integration:

In STEM education, adaptive learning systems have been employed to address diverse learner needs and bridge conceptual gaps. For instance, Bodert (2019) studied the effectiveness of an adaptive

learning platform in a general chemistry course. The research revealed that students using the adaptive system showed improved performance and retention compared to those under traditional teaching methods.

4. Higher Education Adaptive Implementation:

Adaptive learning has been introduced in higher education environments to improve student learning outcomes and tackle the challenges of large class sizes. Dziuban, Moskal, Cassisi, and Fawcett (2016) explored the use of an adaptive learning system in a general education course at a large university. The outcomes demonstrated enhanced student performance, increased engagement, and more efficient use of instructional resources.

Conclusion

In conclusion, the literature review on analyzing the role of artificial intelligence in adaptive learning highlights the transformative potential of AI in personalized education. The comprehensive examination of AI's role in adaptive learning reveals its capacity to offer tailored learning experiences, timely feedback, and individualized content delivery, thereby addressing diverse student needs effectively. Moreover, the review underscores the importance of ethical considerations and transparent governance frameworks to ensure the responsible integration of AI technologies in education, promoting equitable and beneficial outcomes for students.

Chapter Three

Method

Introduction

The Method chapter provides a detailed account of the research design and procedures used in this study on the role of artificial intelligence in adaptive learning. This chapter outlines the research ,participants, data collection methods, and data analysis techniques employed to investigate the impact of AI on adaptive learning and wherethe studywas conducted. By following a systematic approach, this study aims to determine and examine the credibility of the already stated hypotheses.

The Research Design

The Method

In our study on analyzing the role of artificial intelligence in adaptive learning, we employed a descriptive approach; a qualitative research design. To gather data from students, we conducted online survey that captured their perspectives on the impact of AI in adaptive learning environments. These survey allowed us to qualitatively measure the students' experiences and perceptions. Additionally, we administered onlinequestionnaire to teachers, which provided qualitative insights into their observations and opinions regarding the integration of AI in adaptive learning. we aimed to obtain a comprehensive understanding of the role of artificial intelligence in adaptive learning from both student and teacher perspectives. This approach allows us to explore the potential benefits and challenges associated with AI implementation in this context . The study took place at Chadli Ben DJDID University, El Tarf , Algeria .The survey was conducted to the whole levels of English language students through Online platforms in order to have diversity of responses.

Participants

For our study on analyzing the role of artificial intelligence in adaptive learning, we carefully selected the participants to ensure a comprehensive understanding of the topic. We conducted an online survey that was distributed to all levels of English students at Chadli Ben Djdid University in El Taref. This allowed us to gather insights from a diverse group of students, representing different proficiency levels and backgrounds. Additionally, we administered an online questionnaire to the teachers at the department of English, Chadli Ben djdid University. By including the perspectives of both students and teachers, we aim to capture a holistic view of the impact of artificial intelligence on adaptive learning in the context of English education. The participation of these specific groups will provide valuable insights into the experiences and perceptions of those directly involved in the learning process.

Data Gathering Instruments and Procedures

While conducting this study, we carefully selected various tools to ensure that we obtain dependable and precise results, and to showcase our hypotheses effectively.The following instruments that were chosen:

Survey:

A survey is a method of collecting information or data from a group of people. It typically involves asking a series of questions to gather insights, opinions, or facts on a particular topic of interest. For our thesis, we designed a comprehensive survey to collect data from students. The survey was carefully crafted to address our research questions and confirm or reject our hypotheses after the process of analyzingand interpretingthe obtained resultsfrom the collected data. By administering this survey to students, we aimed to gather valuable insights that would help us analyze the role of AI in adaptive learning environments. The survey was designed with the intention of obtaining accurate and reliable information that would contribute to the overall findings of our thesis.

Learners ' survey Description

The survey used was intended to be given to the whole EFL students at the departement of English.The survey is used to collect data related to the investigation about the analysis of the role of artificial intelligence in adaptive learning, besides the main perspectives and opinions of the studentsabout the topic . In addition, to their experiences and point of views about implementing artificial intelligence in adaptive learning environments .The survey used in the research include descriptive method. Additionally, another fact that was considered is the anonymity of the respondent to ensure more truthful responses.

The survey is composed of Eighteen questions,students should answer by ticking of the appropriate answerand give their feedback when ever it necessary. It is divided into five sections.

Section one: Background Information about AI

The purpose of this section is to get a general information about Artificial intelligence, it includes questions whether students are familiar with it or no , and what they are think about the integration of AI in learning.

Section Two: Background Information about Adaptive learning

The purpose of this section is to get a general information about adaptive learning, if students have used any adaptive learning platforms or tools (Q4) , or if they would be open to use AI-powered adaptive learning tools in their studies (Q8).

Section Three: Students Experiences with AI in their learning

The purpose of this section is gather information about the students experiences with integrating AI in their learning, Are you currently using any AI-based tools or applications to support your learning ?(Q6), How important do you think it is for educators to have a good understanding of AI

when implementing it the classroom? (Q11) , How can AI be utilized in collaborative learning environments? (Q14).

Section Four: Students Opinion about the contribution of AI and its benefits and challenges in adaptive learning.

The purpose of this section is to identify the students opinions about the contribution of AI and its benefits and challenges in adaptive learning. In your Opinion, what are the potential benefits of using AI in adaptive learning?(Q7) , In your Opinion, what are the potential limitations or drawbacks of relying heavily on AI in adaptive learning? Q(10) , How does artificial intelligence contribute to adaptive learning? (Q12) , what are the potential challenges of using AI in education ?(Q13).

Section Five : Students Suggestions and perspectives about AI and its integration in learning.

This last section is further suggestions and perspectives of the students about AI and its integration in learning, do you have any suggestions or ideas on how AI can be effectively integrated into education system? (Q15) , do you have any concerns or reservations about using AI in adaptive learning? (16), do you believe AI can replace human teachers in the future? (Q17) , is there any thing else you would like to share about your views on AI in adaptive learning? (Q18).

Questionnaire :

A questionnaire is a set of questions used to gather information or opinions from people.we designed a comprehensive questionnaire to collect data from teachers. The questionnaire was carefully crafted to adress our research questions and confirm or reject our hypotheses, after the process of analyzing and interpreting the obtained results from the collected data. By administering this questionnaire to teachers, we aimed to gather a valuable insights and qualitative data that would

help us analyze the role of artificial intelligence in adaptive learning environments. The questionnaire was designed with the intention of obtaining accurate and reliable information that would contribute to the overall findings of our dissertation .

The teachers ' Questionnaire Description

The questionnaire is designed to investigate the teachers' perceptions regarding therole of artificial intelligence in adaptive learning. , it examinesthe underlying factors, Implementation, benefits and challenges of teachers with the integration of AI in adaptive learning. Also teachers suggestions and opinions about using AI in adaptive learning environment.

The teacher questionnaire consists of eighteen questions, (appendices...) teachers also should tick the appropriate answer in their opinions and that provide a feedback or response in the following lines when it requires in order to geta well organized and comprehensive statistics about the topic . The questionnaire is divided into four sections.

Section one : Background information about AI and adaptive learning.

The purpose of this section is to collect general information about the participants. This part have questions about , how familiar are the participants with the concept of adaptive learning and artificial intelligence.

Section Two : The Implementation of AI and adaptive learning technologies.

The purpose of this section is to know whether they or their students using AI and adaptive learning technologies, have you had any experience implementing adaptive learning technologies in your classroom? Q(2), have you noticed whether hour students use artificial intelligence tools for their study? (Q3) , does your university use AI systems for administrative tasks? (Q4) , how can AI assist in students assessment? (Q13), what types of data or feedback would be most valuable to you

as a teacher when using artificial intelligence in adaptive learning? (Q15) , have you precieved any training or professional development opportunities related to incorporating artificial intelligence in adaptive learning? (Q16) .

Section Three : The Benefits and challenges of integrating AI in adaptive learning.

The purpose of this chapter is to collect data about the benefits and challenges of integrating AI in adaptive learning, do you believe that artificial intelligence can enhance the effectiveness of adaptive learning for students? (Q5),What concerns or challenges do you foresee in implementing artificial intelligence in adaptive learning? (Q6), how do you think artificial intelligence can benefit teachers in terms of instructional planning and assessments? (Q8), In your experience what are the key benefits of using artificial intelligence in adaptive learning? (Q11) , have you encountered any challenges or limitations when using AI in adaptive learning? (Q12) .what negative ways in which artificial intelligence put affect in adaptive learning? (Q17).

Section Four : Teachers Opinions nd suggestions about the integration of artificial intelligence in adaptive learning.

The last section is about the teachers opinions and their suggestions about integrating artificial intelligence in adaptive learning. In your opinion, what role should teachers play in AI- driven adaptive learning environment ?(Q7) , do you have any suggestions or ideas for improving the integration of artificial intelligence in adaptive learning environments? (Q9), how confortable are you with using AI-powered tools and platforms in teaching practice? (Q10),In your opinion, what role should teachers play in guiding and supporting students' learning experiences when using artificial intelligence in adaptive learning? (Q14) , would you like more guidance to enrich your knowledge and skills in using artificial intelligence tools in education? (Q18) .

Conclusion

the main objective of this chapter was to give a clear explanation and provide a detailed account of the design that was used in the work. This is important because it helps the reader grasp how the research was actually carried out. Moving forward, the next chapter will concentrate on presenting the findings and analysing the data too address the research questions and hypotheses.

Chapter Four

Results

Introductin

When it comes to analyzing the role of artificial intelligence in adaptive learning, we dedicatedthe practical part of the study to providing results and answers regarding the impact of AI on student learning. This chapter is specifically focusing on analyzing the surveys conducted with students and questionnaires administered to teachers. By qualitatively and quantitatively analyzing these responses, we aim to uncover valuable insights, solutions, and suggestions to enhance the effectiveness of AI in adaptive learning.

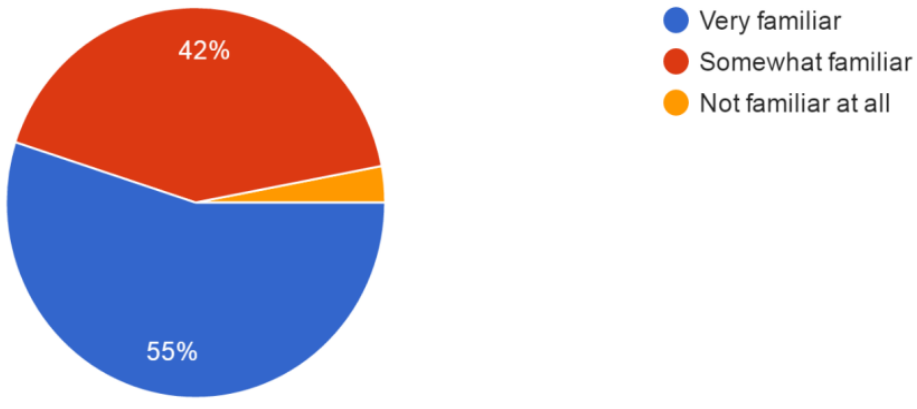
Part One

Students' ResultsAnalysis

The students' responses in the survey highlighted their perspectives on the role of artificial intelligence in adaptive learning, showing their reception towards AI's potential to enhance personalized learning experiences.

Questions 1: To what extent familiar are you with artificial intelligence?

Figure 01 : Students' Familiarity with artificial intelligence



The majority of students 55%, are familiar with artificial intelligence, while 42% are somewhat familiar, and only 3% have no familiarity with AI at all. These findings underscore the varying levels of knowledge and awareness among students regarding artificial intelligence, indicating the

importance of incorporating AI education to ensure all students are well-informed about this technology.

Question 2: What comes to your mind when you think about AI in education?

Students' responses highlight the transformative impact of AI in education. They emphasize how AI can revolutionize learning by customizing education, providing real-time feedback, and offering interactive tools to engage students effectively. This conveys the idea that AI has the power to enhance learning experiences and make education more personalized, engaging, and efficient. In students words:

> "AI can enhance learning experiences. AI can personalize education, provide instant feedback, and offer interactive tools for students. It's an exciting way to make learning more engaging and effective."
>
> "AI creates new way to connect learners with their local environment, allow them tothink critically about ecological problems, and aid them in coming up with realistic solutions"
>
> " When I think about AI in education, I envision a future where each student receive personalized learning experiences tailored to their individual needs and learning styles. AI can analyze students' progress, strengths, and weaknesses to provide customized learning pathways and recommendations "
>
> "AI has the potential to revolutionize education by catering to individual student needs, improving student engagement, and providing educators with valuable insights to enhance their teaching methods. "

Question 3: In what way do you think AI can revolutionize the future of education?

The students' point of view on how AI can revolutionize education is quite insightful. They believe that AI can analyze students' performance, customize lessons based on strengths and weaknesses, and streamline learning efforts across various fields. Additionally, they see AI as a powerful asset to enhance student learning, facilitate teaching and learning processes, and provide easy access to information. These

perspectives collectively highlight the transformative potential of AI in education according to the students. Some students said:

> "AI can analyse students' performance and provide customized lessons and resources based on their strengths and weakness".

> "It can help the learners through minimizing the time and the effort to learne in different fields".

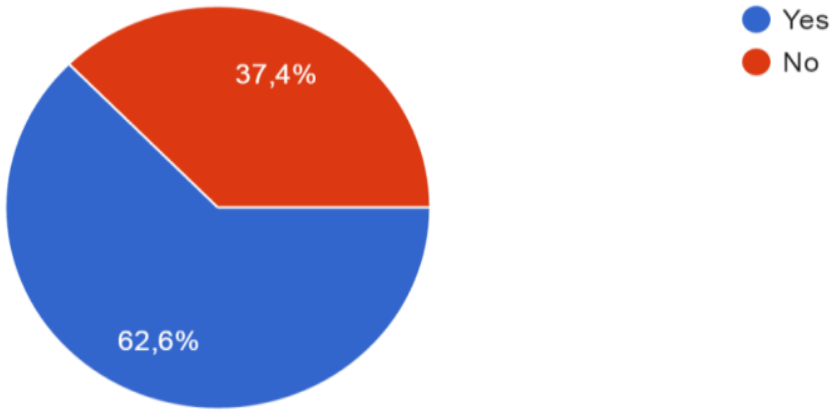
> "AI can customize learning to an individual student's needs , making it powerful asset to enhance student learning. "

> "It can facilitate the process of teaching and learning. "

> "AI is full of power pack capabilities revolutionizing the education industry in multiple ways, including providing real-time feedback, persolized learning experiences, improving accessibility, and automating administrative tasks, improving accessibility for both teachers and students "

Question 4: Have you ever used any adaptive learning platforms or tools? If yes what for?

Figure 02 : Using adaptive learning platforms or tools

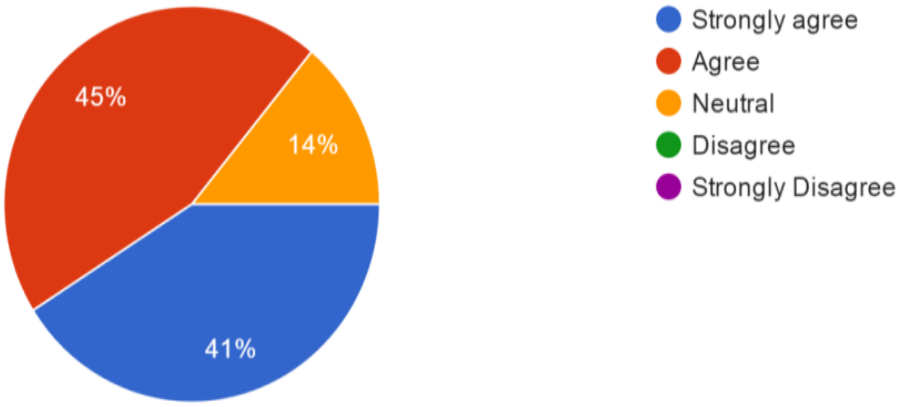


As shown in the above pie-chart, 62.6% of learners reported using adaptive learning platforms or tools wherethey mentioned some adaptive learning platforms they have used such as: Chatgpt, perplexity and learning English, Moodle blackboard and for searching ; Writing essays ;For doing assignments ;and Grammaire ;indicating a significant portion of the students' population engaging with these resources. Conversely, 37.4% of respondents stated that they had not utilized adaptive

learning platforms or tools. These results highlight the prevalence of adaptive learning tools in education and suggest a growing interest in leveraging technology to enhance learning outcomes.

Question 5: Do you believe that artificial intelligence can enhance the learning experience?

Figure 03 :students believe about enhancing artificial intelligence the learning experience



According to the findings, it is evident that a significant percentage of learners, with 45% agree and 41% strongly agree, believe that artificial intelligence can enhance the learning experience. However, only 14% expressed a neutral stance on the matter. These results highlight the positive perception among students regarding the potential of AI to improve the learning process, emphasizing the importance of further exploring and integrating AI technologies in education.

Question 6: Are you currently using any AI-BASED tools or applications to support your learning ? Justify ?

Most of the participantsresponded positivelyto the use AI – BASED tools to support their learning.Asone of student words :

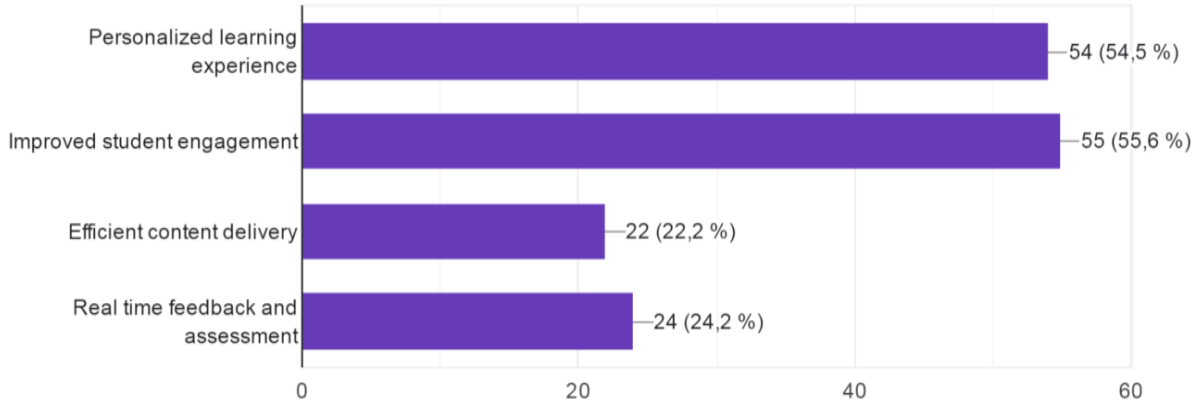
> “ AI is transforming the way that students learn in the digital age . By using machine learning recommendation systems, AI-powered tools can provide personalized learning experiences by tracking progress and adapt the task or game accordingly to make it more challenging or easier. “
>
> “Yes , I’m using an AI-based tool called Grammarly to help with my writing assignments. It helps me identify and correct grammar mistakes. Suggests better word

Choices, and even provides feedback on the clarity and tone of my writing. It's like having a virtual writing assistant that helps me improve my writing skills and produce higher-quality work "

However,The minority not usingAI-BASED tools or applications to supporttheirlearning, they may face barriers like lack of awareness, limited access to technology, or preference for traditional methods.

Question 7: In your opinion, what are the potential benefits of using AI in adaptive learning? Other (please specify)?

Figure 04: Students opinion about the potential benefits of using AI in adaptive learning



In the realm of integrating AI into adaptive learning, the benefits are truly multifaceted. According to the survey results, 54.5% of respondents highlighted the significance of personalized learning experiences, emphasizing the tailored approach AI can offer to each student. Moreover, 55.6% emphasized the enhanced student engagement AI fosters, showcasing its ability to captivate learners in a more interactive manner. Additionally, 22.2% acknowledged the efficiency in content delivery facilitated by AI, while 24.2% appreciated the real-time feedback and assessment capabilities it provides. These findings underscore the diverse advantages of AI in adaptive learning.

Moreover,some learners add comment by saying that AI:

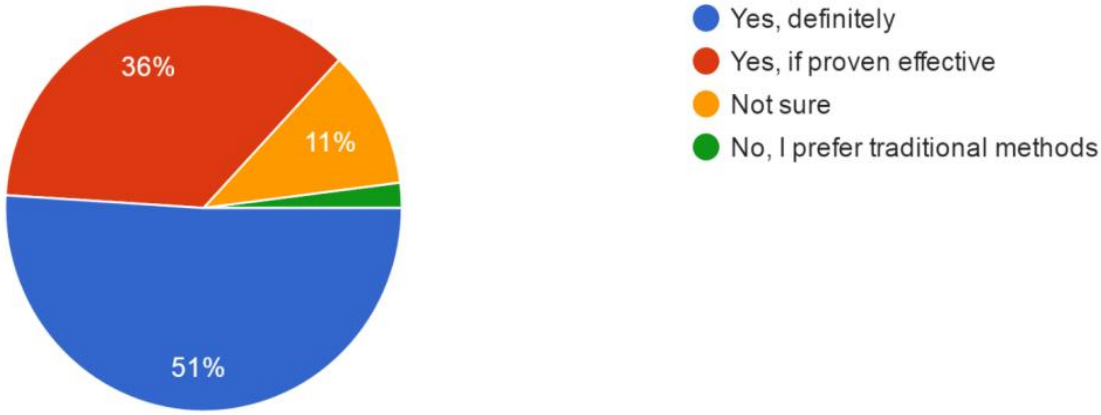
"Helps the students learn at their own pace and in their own style."

"It helps to develop your skills in programming and stuff. "

"Accomplishing work neatly and quickly. "

Question 8: would you be open to using AI-powered adaptive learning tools in your studies?

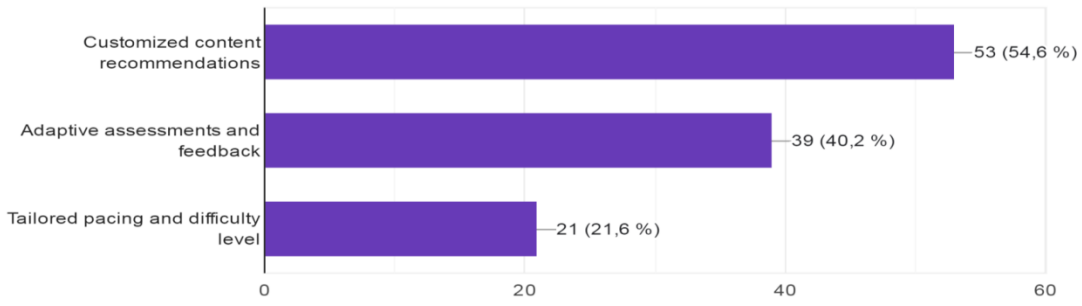
Figure 05: using AI-powered adaptive learning tools in students' studies



The majority of respondents, 51%, expressed a strong willingness to utilize AI-powered adaptive learning tools in their studies. Additionally, 36% acknowledged the effectiveness of such tools, while 11% remained uncertain, and only 2% preferred traditional methods over AI. These findings show the positive attitude and openness of students towards incorporating AI-powered adaptive learning tools in their educational journey, indicating a readiness to embrace technology for enhanced learning experiences.

Question 9: How do you think AI can personalize the learning experience for students ?Other (please specify)?

Figure 06: students thinking about how AI can personalize their learning experience



The survey findings manifest the impact of AI on personalizing the learning experience for students. Customized content recommendations were emphasized by 54.6% of participants, highlighting AI's capacity to suggest materials tailored to individual needs. Adaptive assessments and feedback were deemed crucial by 40.2% of respondents, showcasing AI's ability to provide personalized evaluation and guidance. Moreover, 21.6% recognized the importance of AI in adjusting pacing and difficulty levels to cater to diverse learning styles**.**In the words of one student:

"Customizing the contents and pace to each student's specific requirements. "

Another has said:

"Customized Study plan and learning pathways. "

Question 10: In your opinion, what are the potential limitations or drawbacks of relying heavily on AI in adaptive learning?

Students were very concerned about the potential negatives of heavy reliance on AI in adaptive learning. They claimed that excessive dependence on AI could lead them lose their cognitive abilities, self-reliance, confidence in their knowledge and style, and may introduce biases, privacy issues, and a lack of emotional connection in learning. Moreover, students highlight the limitations of AI tools in terms of lacking human creativity and providing unreliable content, potentially impeding the development of critical thinking skills and natural diligence. These shared viewpoints emphasize the need for a balanced approach to integrating AI in education to address these concerns and maintain a well-rounded learning experience for students.Students justified their answers by saying:

"Make students relying only on AI which affect their capacities. "

"Lack of self-confidence in our information and our personal style in answering. "

"Relying on technology, bias, privacy, and lack of emotion. "

"AI tools are machines after all and they lack the human creativity, so they sometimes"

"do not provide reliable content. "

"It kills the natural skills of diligence. "

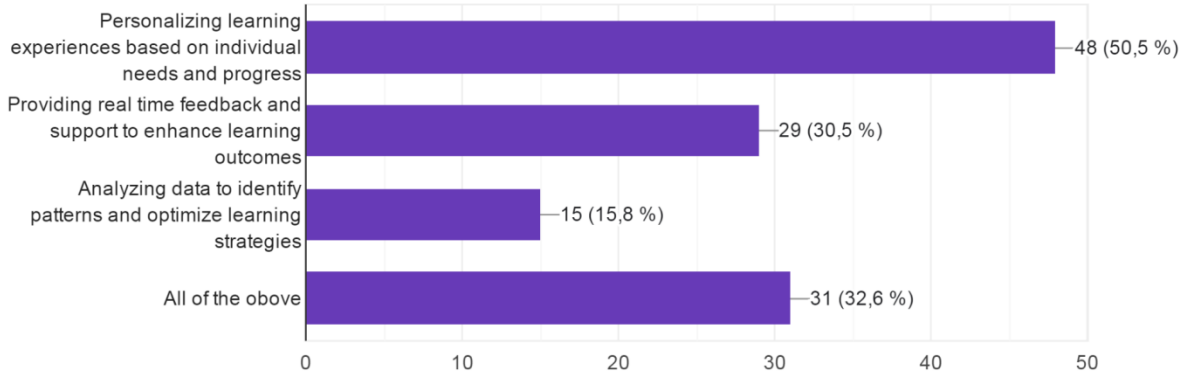
Question 11: How important do you think it is for educators to have a good understanding of AI when implementing it in classroom?

Students unanimously believe that it's crucial for teachers to have a solid grasp of AI when incorporating it into the classroom. They stress the significance of educators understanding the fundamental principles of AI to effectively engage with students and assist them in utilizing innovative technologies. Moreover, they highlight the increasing necessity for educators to integrate AI into their teaching methods to efficiently manage courses in today's digital era. Additionally, students emphasize the vital role of teachers in ensuring the ethical use of AI in educational settings, particularly in addressing issues related to bias. Students pointed that:

> "It is important for educators to know at least the basic principles of AI, so they can interact with their learners and help them while using such innovation."
>
> "I think educators are obliged to use the AI in the classroom to manage well their courses since the reliance on digital and technologies is more and more in all the world."
>
> "Educators play a key role in ensuring the ethical use of AI in the classroom including addressing issues of bias."

Question 12: how does artificial intelligence contribute to adaptive learning?

Figure 07: artificial intelligence contribution to adaptive learning

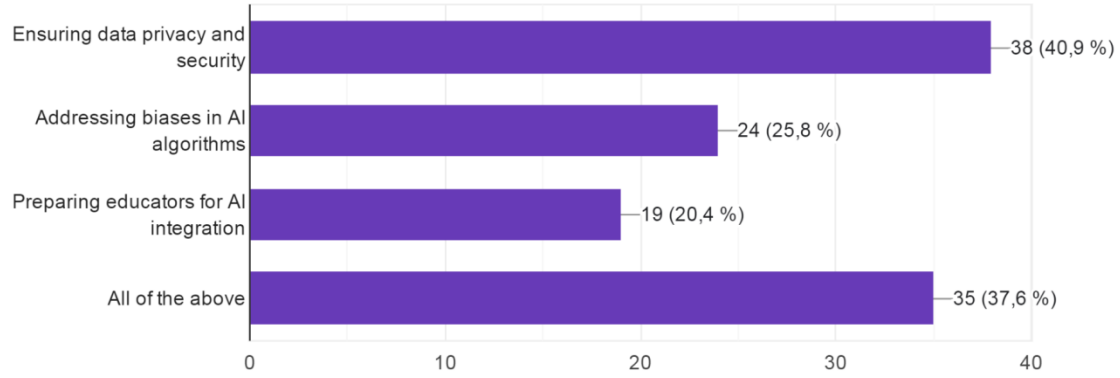


The figure abovereveals the significant contributions of artificial intelligence to adaptive learning. Personalizing learning experiences based on individual needs and progress was highlighted by 50.5%, which shows AI's ability to tailor education to each student. Providing real-

time feedback and support to enhance learning outcomes was emphasized by 30.5% of respondents, demonstrating AI's impact on student progress. Moreover, 15.8% recognized AI's role in analyzing data to optimize learning strategies. Notably, 32.6% of learners acknowledged the combined benefits of all the mentioned AI capabilities in adaptive learning.

Question 13: What other potential challenges of using AI in education?

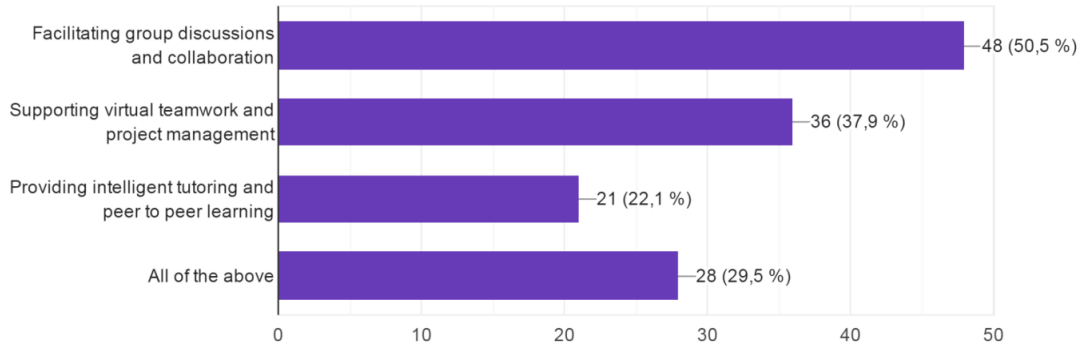
Figure 08: the potential challenges of using AI in education



The survey findings shed light on the potential challenges of employing AI in education. Insuring data privacy and security was deemed crucial by 40.9% of participants, highlighting the paramount importance of safeguarding students' information. Addressing biases in AI algorithms to promote equitable outcomes in education was recognized by 25.8% of respondents. Furthermore, 20.4% emphasized the necessity of preparing educators for AI integration, stressing the importance of training and support. Notably, 37.6% of learners identified all the aforementioned challenges as significant obstacles in the effective implementation of AI in education.

Question 14:how can AI be utilized in collaborative learning environments?

Figure 09: the utilization of AI in collaborative learning environments



From the figure above, we can determinethe diverse ways in which AI can be leveraged in collaborative learning environments. Facilitating group discussions and collaboration werehighlighted by 50.5% of participants, expresses AI's role in promoting teamwork and knowledge sharing. Supporting virtual teamwork and project management was recognized by 37.9% of respondents, illustrating AI's capacity to streamline collaborative tasks in online settings. Moreover, 22.1% acknowledged AI's potential in providing intelligent tutoring and enabling peer-to-peer learning interactions. Notably, 29.5% of learners identified all the mentioned AI applications as valuable tools for enhancing collaborative learning environments.

Question 15: Do you have any suggestions on how AI can be effectively integrated into education system?

The main point shared by the students in their responses is the emphasis on the importance of integrating AI into the education system in a thoughtful and responsible manner. They emphasized the need to incorporate lessons on ethical AI use and digital citizenship into the curriculum to empower students to be responsible users of AI. Additionally, students suggest that effective integration of AI requires a well-designed program overseen by specialists and that teachers play a crucial role in educating students about both the positive and negative aspects of AI, guiding them on how to utilize it for their benefit. Overall, the students stress the significance of integrating AI into education in a way that promotes ethical use, awareness, and responsible engagement with this technology. One of the students suggests:

"Integrating lessons on ethical AI use and digital citizenship into the curriculum empowersstudents become responsible and informed users of AI technology. "

Others suggest:

"It can be effectively integrated into education system through a well-designed programme controlled by specialist. "

"Teachers should raise the Learner's awareness about the negative side of AI and how they should use it for their benefits. "

"Integrating AI into the education system it can be effectively by providing training and support for educatorson how to use AI tools in the classroom. This could include professional development opportunities, workshops, and ongoing support to ensure that educators are able to effectively leverage AI to enhance student learning ".

Question 16: Do you have any concerns or reservations about using AI in adaptive learning?

Students were skeptic aboutsome individuals, such as students, teachers, or parents, towards AI-driven learning methods. They also emphasizing the need to maintain a balance between the virtual and real world. Furthermore, there is a concern expressed about the risk of AI making people lazy. Overall, the students' main viewpoint revolves around the challenges related to acceptance, data analysis, maintaining a balance between virtual and real-world experiences, and the impact on human behavior like laziness when using AI in adaptive learning.Some Learner's answers are:

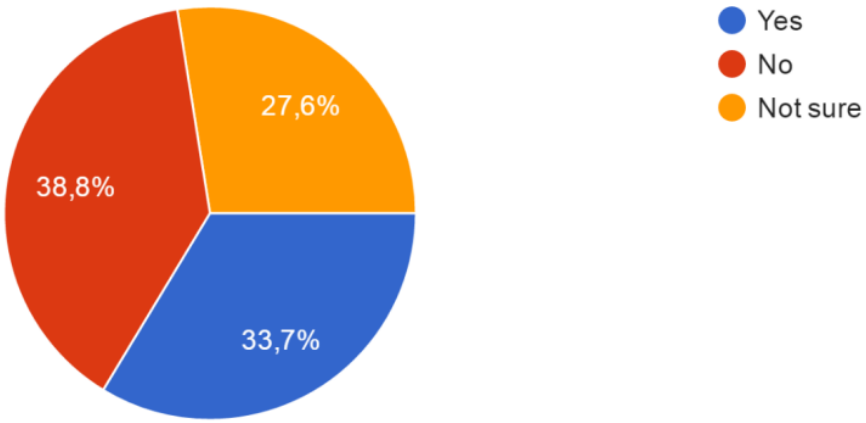
" The concerns about AI in adaptive learning include algorithm bias, overreliance on technology, and data privacy. It is important to address these concerns by monitoring algorithms for fairness, maintaining a balance between technology and human interaction, and implementing strong privacy measures ".

"People need use it with keeping the balance between virtual world and real world. "

"It produces lazy students or to some extent teachers."

Question 17: Do you believe AI can replace human teachers in the future?

Figure 10: Can AI replace human teachers in the future



In the realm of integrating AI effectively into the education system, there are varying perspectives on the potential of AI to replace human teachers in the future. According to the survey results, 33.7% of respondents expressed belief in AI's capacity to replace human teachers, envisioning a future where AI takes on a more prominent role in education. Conversely, 38.8% of participants firmly stated that AI cannot replace human teachers, emphasizing the irreplaceable value of human interaction and guidance in the learning process. Moreover, 27% of respondents remained uncertain, reflecting the complexity and ongoing debate surrounding the role of AI in education.

Question 18: Do you have anything else would you like to share about your views on AI in adaptive learning ?

The main viewpoint shared among the students' responses regarding AI in adaptive learning is the recognition of AI's significant impact on various forms of media, transforming how we interact with and consume media. They also emphasize viewing AI as a helpful tool for enhancing the educational process rather than solely as a risk. Additionally, students acknowledge the value of human teachers in education, highlighting the importance of human efforts and emotional connection that may not be fully replicated by AI. Overall, the students' main perspective centres on appreciating AI's transformative role in media consumption and education while recognizing the unique strengths of human teachers in the learning process.Some Learner's views are :

“AI has significant impact on various forms of media, from text to video and 3D .AI-POWERED technologies such as natural language processing, image and audio recognition, and computer vision have revolutionized the way we interact with and consume media. “

“We don’t have to see it as a risk but rather as a helping tool to develop educational process. “

“I think it is really helpful, but the humans would be always better teachers because of the efforts and showing the emotions maybe. “

“As a student,I think AI in adaptive learning can make studying more fun and customized. It’s like having a smart helper that knows what I struggle with.But we still need our teachers to guide us and help us learn in the best way possible”.

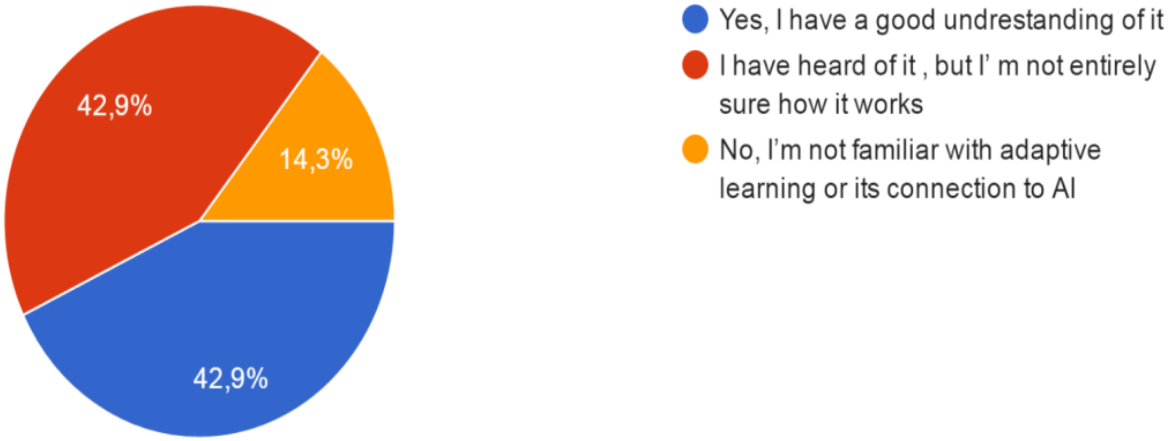
Part Two

Teachers'Results Analysis

The teachers' responses in the questionnaire indicated a favorable attitude towards incorporating AI in education to improve personalized learning experiences for students.

Question 1: Are you familiar with the concept of adaptive learning and how it utilizes artificial intelligence ?

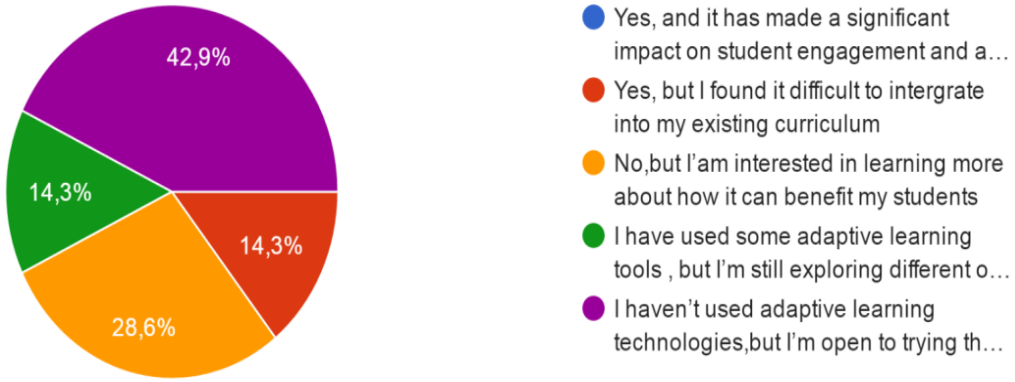
Figure 11: teachers familiarity with adaptive learning and how it utilizes artificial intelligence



The questionnaire outcomes of the first question revealed varying levels of familiarity with adaptive learning and its utilization of artificial intelligence. A significant 42.9% of respondents demonstrated a strong understanding of adaptive learning, presenting a comprehensive grasp of how AI is harnessed to tailor learning experiences. In contrast, an equal percentage of 42.9% acknowledged having heard of adaptive learning but expressed uncertainty about its operational mechanisms, indicating a need for further elucidation on the AI-adaptive learning nexus. Furthermore, 14.3% of participants admitted to lacking familiarity with adaptive learning or its connection to AI, suggesting a knowledge gap that may benefit from additional educational resources.

Question 2: Have you had any experience implementing adaptive learning technologies in your classroom?

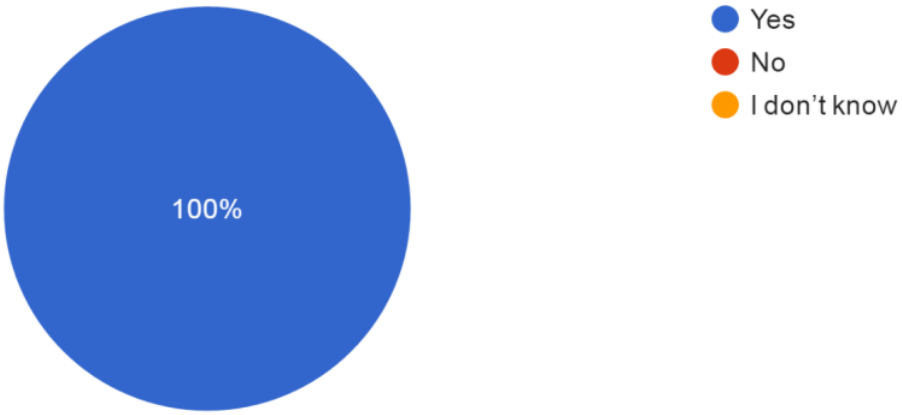
Figure 12:Teachers experiences with adaptive learning technologies implementationin their classroom



The figure above unveiled a spectrum of experiences and perspectives among Teachers. A significant 42.9% of respondents expressed openness to trying adaptive learning technologies in the future, indicating a willingness to explore innovative educational tools. Additionally, 28.6% of participants conveyed interest in learning more about the potential benefits of adaptive learning for their students, demonstrating a proactive approach to enhancing teaching practices. On the other hand, 14.3% of educators shared challenges in integrating adaptive learning into their existing curriculum, highlighting the complexities involved in incorporating new technologies into established teaching frameworks. Similarly, another 14.3% of participants reported using some adaptive learning tools but remained in the process of exploring different options, underscoring a continuous journey of discovery and experimentation in leveraging technology for educational purposes.

Question 3: Have you noticed whether your students use artificial intelligence tools for their study?

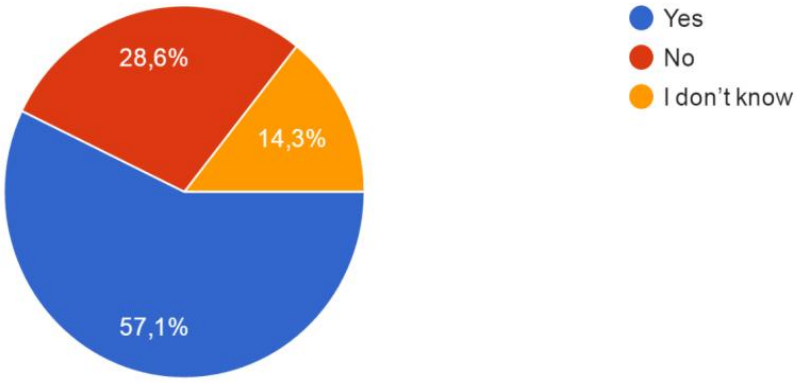
Figure 13:Students use of artificial intelligence tools for their studies



The results revealed a compelling trend among students, with a unanimous 100% utilizing artificial intelligence tools for their studies. This comprehensive adoption of AI tools signifies a widespread incorporation of technology into the learning practices of students, potentially contributing to enriched educational experiences and improved learning outcomes.

Question 4: Does your university use Technology for administrative tasks (students registration, grades, absences,...etc)?

Figure 14: university use of technology for administrative tasks

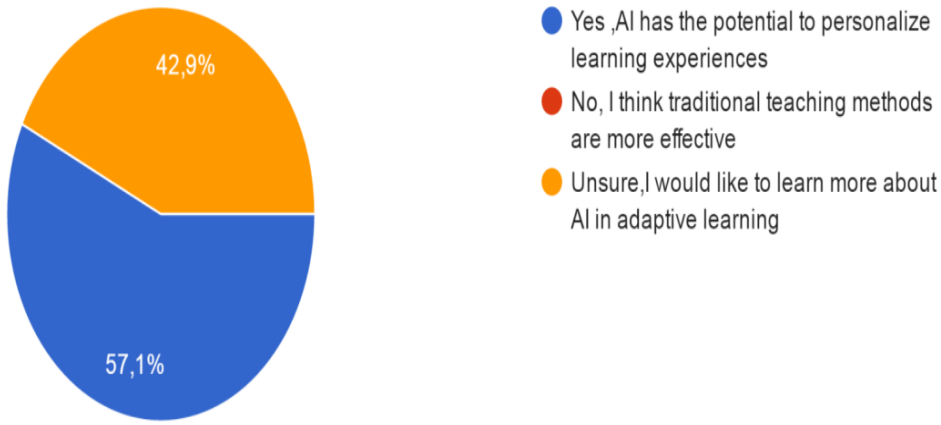


The survey findings indicated varying degrees of technology adoption in universities for administrative tasks. Specifically, 57.1% of respondents reported using students' registration, grades, and absences, while 28.6% stated they do not employ AI for these purposes. Interestingly, 14.3% of respondents were unsure about the usage of AI in administrative tasks. This diversity in

responses highlights the spectrum of AI integration in managing academic operations, showcasing both adoption and uncertainty within the higher education sector .

Question 5: Do you believe that artificial intelligence can enhance the effectiveness of adaptive learning for students?

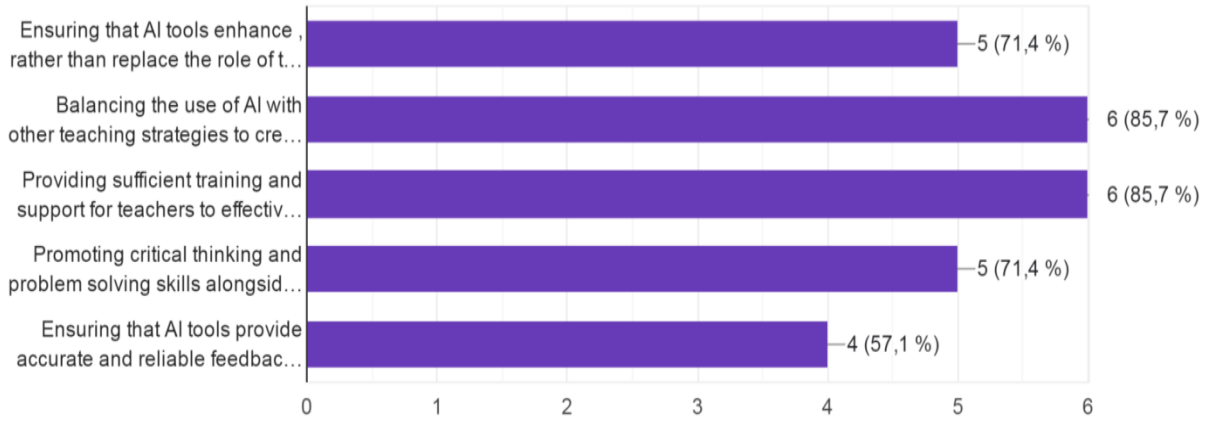
Figure 15: artificial intelligence in enhancing the effectiveness of adaptive learning for students



A split perspective on the role of artificial intelligence in enhancing adaptive learning. A majority of 57.1% acknowledged AI's potential to personalize learning experiences, emphasizing its capacity to tailor educational content to individual student needs. On the other hand, 42.9% expressed uncertainty and a desire to delve deeper into the realm of AI in adaptive learning. This divergence in opinions underscores the ongoing discourse surrounding the integration of AI in educational settings and its impact on personalized learning approaches.

Question 6: What concerns or challenges do you foresee in implementing artificial intelligence in adaptive learning?

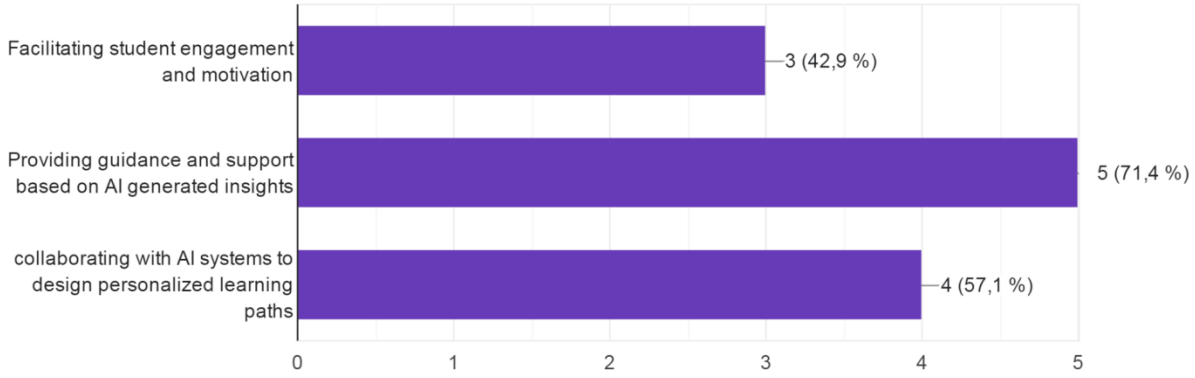
Figure 16:the challenges of implementing artificial intelligence in adaptive learning



71.4% emphasized the importance of ensuring that AI tools enhance, rather than replace, the role of teachers. And alsohighlighted the importance of promoting critical thinking and problem-solving skills alongside the use of AI technologies, Moreover, 85.7% underscored the necessity of balancing the use of AI with other teaching strategies to create a comprehensive learning experience. Additionally, an equal percentage 85.7% stressed the need for providing adequate training and support for teachers to effectively integrate AI into their teaching practices, while 57.1% emphasized the significance of ensuring that AI tools provide accurate and reliable information to support student learning.

Question 7: In your opinion, what role should teachers play in an AI-driven adaptive learning environment? Other (please specify)?

Figure 17: teachers opinions about the role they should play in an AI -driven adaptive learning environment



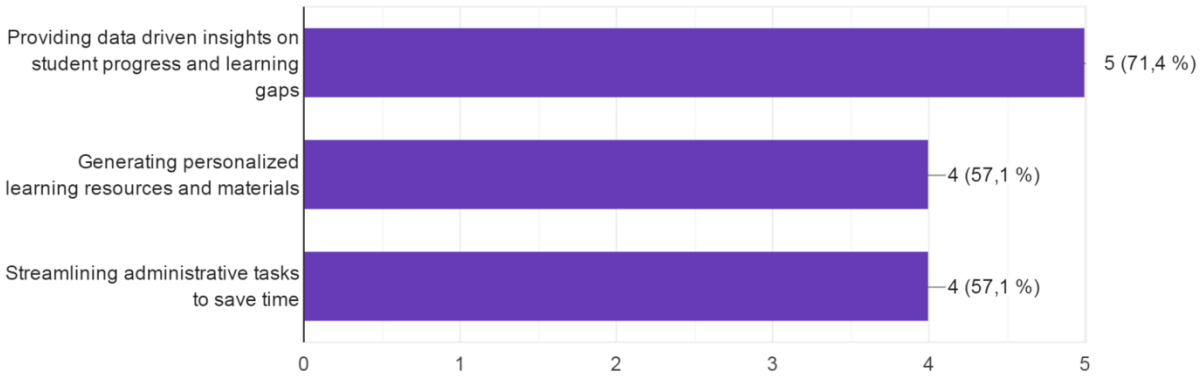
In an AI-driven adaptive learning environment, teachers should fulfil various roles. Specifically, 42.9% highlighted the importance of teachers facilitating student engagement and motivation, while 71.4% emphasized the significance of teachers providing guidance and support based on AI-generated insights. Additionally, 57.1% of respondents stressed the role of teachers collaborating with AI systems to design personalized learning paths.

In a teacher word:

> "Teachers should keep monitoring the use of AI and observe its efficiency and the notice is any problems emerge."

Question 8: In your opinion, How canartificial intelligence benefit teachers in terms of instructional planning and assessment?

Figure 18:the benefits of artificial intelligence in terms of instructional planning and assessment



In terms of instructional planning and assessment, artificial intelligence can benefit teachers in various ways. According to the survey findings, 71.4% highlighted that AI can provide data-driven insights on student progress and learning gaps, 57.1% mentioned that AI can generate personalized learning resources and materials, and emphasized the role of AI in streamlining administrative tasks to save time. These AI capabilities can significantly enhance teachers' efficiency, effectiveness, and ability to cater to individual student needs.

Question 9: Do you have any suggestions for improving the integration of artificial intelligence in adaptive learning environments?

The main shared viewpoint between the teachers' suggestions is the emphasis on continuous improvement and adaptation of AI algorithms to provide accurate and personalized recommendations for students. They also stress the importance of incorporating natural language processing capabilities, ensuring data privacy, and offering training opportunities for teachers to effectively utilize AI tools in adaptive learning environments.Someteachers suggest:

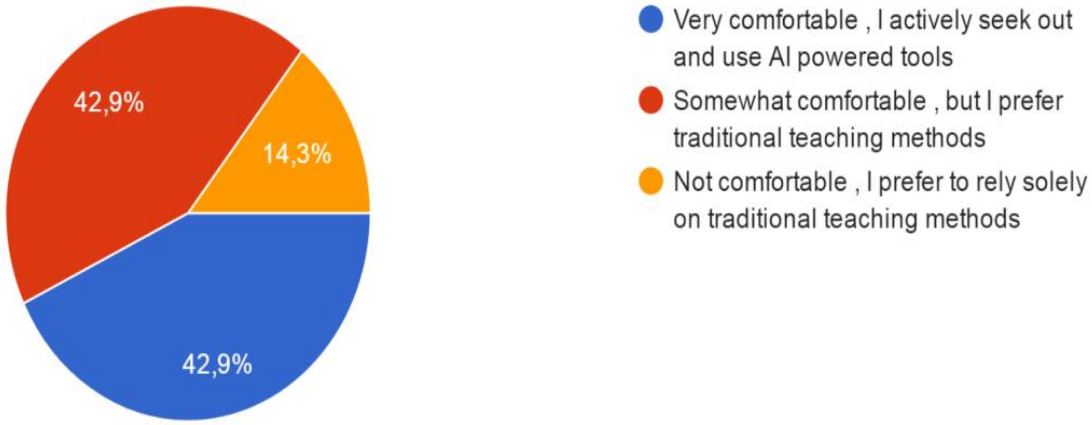
> "There are several ways to enhance the integration of artificial intelligence in adaptive learning environments. One idea is to ensure that AI algorithms are continuously adapted and improved to provide more accurate and personalized recommendations for students. Additionally, incorporating natural language processing capabilities into AI systems can help facilitate more interactive and conversational experiences for students. It's also important to priorities data privacy and security measures to protect students' information. Lastly, providing professional development opportunities for teachers to enhance their understanding and skills in utilizing AI

tools can greatly contribute to the successful integration of AI in adaptive learning environments."

"There must be training for teachers and period of trial to figure out possible difficulties. We need to conduct more studies for the implementation of this new up -to date technologies and methods. "

Question 10: How comfortable are you with using AI-powered tools and platforms in your teaching practice?

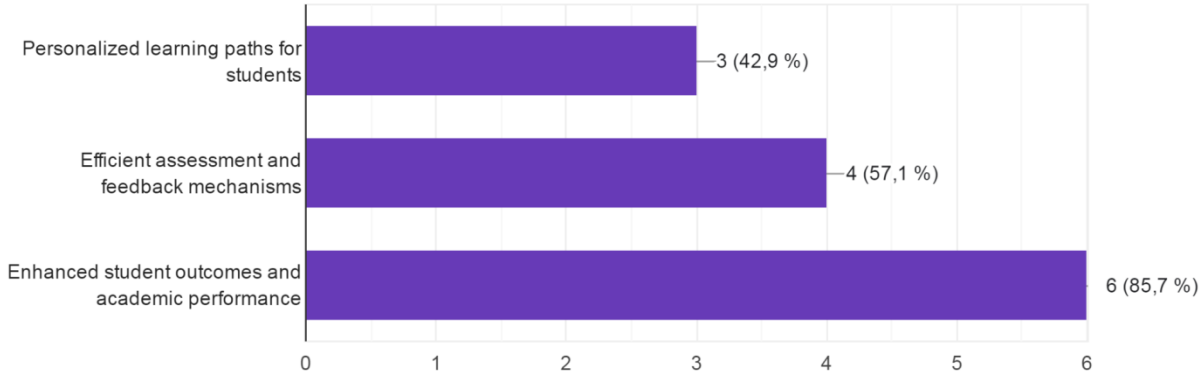
Figure 19: how teachers comfortable with using AI-powered tools and platforms in teaching practices



Based on the teachers' answers, when asked about their comfort level with AI-powered tools in teaching, 42.9% of respondents stated they are comfortable and actively seek out such tools, 42.9% mentioned they are somewhat comfortable but prefer traditional teaching methods, and 14.3% expressed discomfort and rely solely on traditional teaching methods.

Question 11: In your experience, what are the key benefits of using artificial intelligence in adaptive learning?

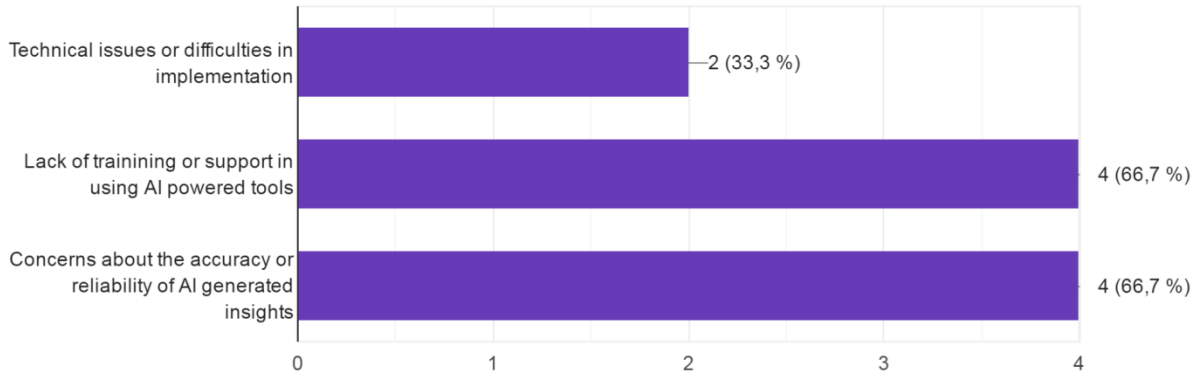
Figure 20:the key benefits of using artificial intelligence in adaptive learning



Based on the survey results, the key benefits of using artificial intelligence in adaptive learning are as follows: 42.9% of respondents highlighted personalized learning paths for students, 57.1% emphasized efficient assessment and feedback mechanisms, and 85.7% pointed out enhanced student outcomes and academic performance.

Research Question 12: Have you encountered any challenges or limitations when using AI in adaptive learning? If so, please describe.

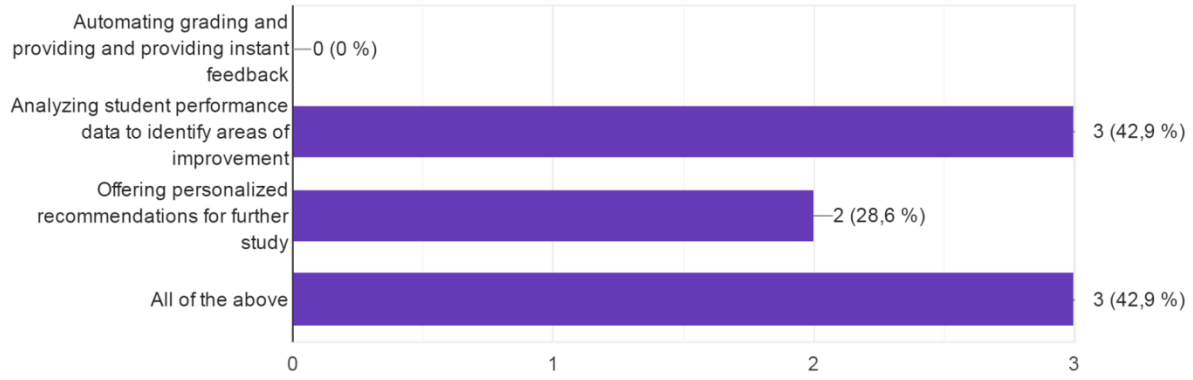
Figure 21: teachers challenges when using AI in adaptive learning environment



When asked about challenges or limitations in using AI in adaptive learning, 33.3% of teachers mentioned technical issues or difficulties in implementation, while 66.7% highlighted a lack of training or support in using AI-powered tools, and expressed concerns about the accuracy or reliability of AI-generated insights.

Question 13: How can AI assist in student assessment?

Figure 22: AI assistant for students' assessment



For student assessment, AI plays a crucial role by analyzing performance data to pinpoint areas for improvement, providing personalized study recommendations, and offering a comprehensive approach to enhance learning outcomes. The findings from the survey reveal that 42.9% of respondents highlighted the importance of analyzing performance data, 28.6% emphasized personalized study recommendations, and 42.9% recognized the value of both strategies in leveraging AI for student assessment . This demonstrates the multifaceted ways AI can support educators in evaluating and guiding student progress effectively.

Question 14: In your opinion, what role should teachers play in guiding and supporting students' learning experiences when using artificial intelligence in adaptive learning?

The teachers' feedback concerning the crucial role teachers have in helping students effectively use AI tools for personalized learning stress the significance of teachers in developing critical thinking abilities, offering customized feedback, and establishing interactive learning settings that align with AI advancements.Some teachers said:

> "Teachers play a crucial role in guiding and supporting students'learning experiences with artificial intelligence in adaptive learning. They can provide guidance on how to effectively navigate and utilise AI tools, help students interpret and analyze the data generated by AI, and ensure that students are receiving personalized and meaningful feedback. Teachers can also Foster critical thinking skills by encouraging students to question and evaluate the AI algorithms and results. Ultimately, teachers act as

facilitates, helping students harness the power of AI while ensuring a well-rounded and holistic learning experience ."

"Teachers play a vital role in guiding and supporting students'learning experiences when using artificial intelligence in adaptive. They act as mentors, motivators, and facilitaters throughout the educational journey, teachers can help students set personalized learning goals based on their individual needs and abilities. Furthermore, teachers can create a supportive and engaging learning environment but encourages students to explore, experiment, and learn at their own pace. "

"Teachers should call attention to the unlimited risks of artificial intelligence in creating a tradition of overreliance and dependency on technology in the sense that this may decrease students' natural critical thinking and problem-solving competencies. "

Question 15: What types of data or feedback would be most valuable to you as a teacher when using artificial intelligence in adaptive learning?

The main point of view shared among the responses from teachers is that they would find detailed, individualized data and feedback on each student's progress, performance, strengths, weaknesses, engagement levels, and learning preferences to be most valuable when using AI for adaptive learning.In some teachers words,

"As a teacher, there are several types of data and feedback that would be availableto me when using artificial intelligence in adaptive learning. For example, I would find it helpful to receive insights on students'progress and performance, such as their strengths, weaknesses ,and areas for improvement. Data on students' engagement and participation levels can also provide valuable information. Additionally, receiving feedback on the effectiveness of the AI algorithms and suggestions or personalized interventions or resources would be beneficial in guiding my teaching strategies. Overall, having access to comprehensive and real-time data and would greatly support my ability to tailor instruction and support individual student needs. "

"As a teacher, the most valuable types of data and feedback would encompass a wide range of detailed insights into each student's educational journey. Understanding each student's progress,

performance, and learning preferences is crucial for effective teaching. Having access to data that delves into how students are interacting with the material would be immensely beneficial. "

"Systematic evaluation can be a great assistance. "

"Language and subject related data and feedback. "

Question 16: Have you received any training or professional development opportunities related to incorporating artificial intelligence in adaptive learning? If yes, please describe the training and its impact on your teaching practice**.**

All teachers responded by No ,they haven't received any training. One possible reason for this could be the lack of awareness or resources provided by educational institutions regarding AI integration. Additionally, some teachers might feel overwhelmed by the rapid advancements in technology and the perceived complexity of AI, leading to a hesitation to seek out training opportunities. Moreover, the absence of clear guidelines or incentives from educational authorities could also contribute to the lack of professional development in this area.

Question 17: What negative ways in which artificial intelligence put affect in adaptive learning?

In essence, teachers express concerns about AI's potential biases, inaccuracies, and limitations impacting personalized learning. They fear misinterpretation of student data, perpetuation of biases, and diminishing the role of human teachers. Balancing AI and human involvement is crucial to ensure AI complements rather than replaces educators in adaptive learning.In some of the teachers words:

"In adaptive learning, artificial intelligence can have some potential negative impacts. For example, AI algorithms may not always accurately interpret and analyze student data , leading to incorrect recommendations or feedback. This can result in a lack of personalized learning experiences and hinder students progress. Additionally, over-reliance on AI systems may reduce the role of human teachers, potentially diminishing the importance of human interaction and personalized guidance. It's important to strike a balance between AI and human involvement to ensure a holistic and effective adaptive learning. "

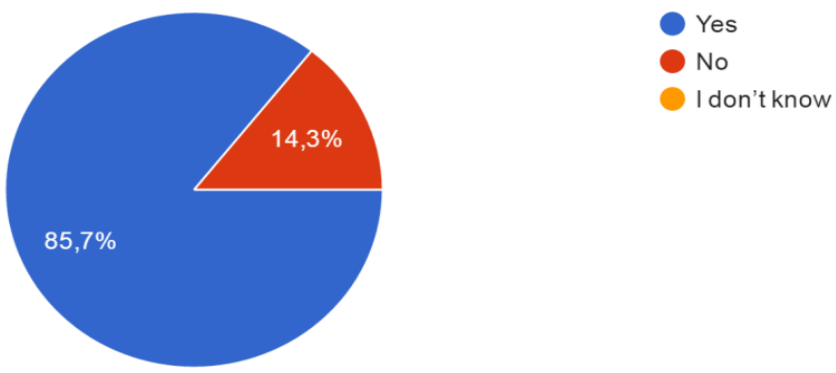
"Artificial intelligence, when integrated into adaptive learning, can bring about negative consequences that need to adressed. One significant concern is the potential for AI algorithms to perpetuate biases and striotypes, leading to unfair treatment or opportunities for certain student groups. Moreover, diminishing the crucial role of teachers in the learning process. "

"Over dependency on technology, limitations of human problem-solving."

"The differences among students call for individual support. There must be a focus on every single student which results in different tasks, materials, and interventions. "

Question 18: Would you like more guidance to enrich your knowledge and skills in using artificial intelligence tools in education?

Figure 23: the guidance to enrich teachers knowledge and skills in using artificial intelligence tools in education



85.7% express interest are keen on enriching their knowledge and skills in utilizing artificial intelligence tools in education. This high percentage reflects a strong desire among educators to further explore and enhance their capabilities in integrating AI into educational practices. Additionally, 14.3% of respondents indicated they do not require further guidance at this time, showing a smaller but still notable minority .

Conclusion

In conclusion, this chapter presented the results of the survey administered to students and the questionnaire administered to teachers, focusing on the role of AI inadaptivelearning. The data collected was analyzed quantitatively and quantitatively to provide valuable insights into the research questions and hypotheses. These Results serve as a foundation for further discussions and analysis in the subsequent chapters. The findings obtained through this research will contribute to a better understanding of the role of artificial intelligence in adaptive learning and provide implications for the integration of artificial intelligence in educational settings.

Chapter Five

Discussion

Introduction

In the final section, the main focus is on the analysis of the fundings, which is essential for validating or devalidating the hypotheses and addressing the research questions. This part also highlightes the implications and outcomes. Additionally, it recognizes the limitations faced during the research process, acknowledging the challenges encountered by the researchers. Finally, recommendations are provided that can have practical implications for the Ministry of Education, teachers, students, and future research efforts in this field.

Discussion of the Research Questions and Hypotheses

Question one/ The Contribution of Artificial Intelligence to Adaptive Learning

The firstquestion**is**set to gain insights about how canartificial intelligence contribute to adaptive learning.

The results obtained from the students'survey and teachers' questionnaire revealed that the majority of EFL learners and teachers at the Department of English, Chadli bendjedid University agreeing thatAI plays a significant role in enabling and enhancing adaptive learning systems. Adaptive learning is an educational approach that tailors the learning experience to individual students' needs, abilities, and preferences, with the goal of optimizing their learning outcomes.

In other words, as shown in the results of the survey, students agree that AI contributes to adaptive learning, it is evident that most view AI as a valuable tool for improving education this positive perception is in line with the various ways AI can be utilized in educational environments.

According to students' responses AI can personalize learning experiences based on individual needs and progress by analyzing data about students' abilities and tailoring the content, pace, and approach accordingly. They also indicate that AI can provide real-time feedback and support to enhance learning outcomes by monitoring students' performance and offering immediate guidance and assistance.

More than that, AI can analyze data to identify patterns and optimize learning strategies by examining large datasets related to students' performance, learning styles, and instructional methods, and using these insights to refine curricula and teaching approaches. Therefore, the first hypothesis wich states that the use of artificial intelligence in adaptive learning will lead to improved personalized learning experiences for students,is proved to be true.

Furthermore, teachers also confirm that artificial intelligence can enhance the effectiveness of adaptive learning for students and highlighted how it can enable more adaptive and personalized learning environments,by contributing to improved personalized learning experiences for students.AI can automate the grading process, providing instant feedback to students, which helps them understand their mistakes and areas of improvement more quickly. Additionally, AI can analyze vast amounts of students' performance data, including assessments, assignments, and participation, to identify areas where individual students may be struggling. This information can be used to adapt the learning materials and teaching methods, ensuring that each student receives personalized support in the area neededthe most.

By leveraging AI for students' assessment in these ways, educators can gain valuable insights into individual student progress, strengths, and weaknesses, enabling them to adapt the learning experience to better meet the needs of each student. Which prove that artificial intelligence contribute to adaptive learning.

Question two/if yes, to What Extent AI Affects Students'Engagement and Learning Outcomes?

The second question is set to gain insights about how artificial intelligence affects students' engagement and learning outcomes.

In light of the students and teachers answers to this question, it can be observed that artificial intelligence has potential benefitsand essential advantages in adaptive learning.

The majority of learners seem to recognize the potential benefits of AI-powered tools in enhancing their learning experiences through personalization, adaptability, and progress tracking.The student's

quote aptly captures some of the key advantages that AI can bring to the learning process.This personalized approach can potentially increase engagement, understanding, and retention, as the learning experience is customized to the individual's needs and abilities.Additionally, AI-based tools can provide automated feedback, assessment, and support, freeing up valuable time for educators to focus on higher-leveltasks and one-on-one interactions with students. Intelligent tutoring systems, for instance, can provide real-time guidance, explanations, and recommendations based on the student's responses and identified areas of difficulty.

Students' also cited AI's potential to tailor education to each student's needs is a valuable tool for boosting engagement, motivation, and learning outcomes. More than that, AI can aid educators by automating tasks, offering instant feedback, facilitating adaptive learning, and generating interactive resources.

Moreover, the results also revealed that AI in adaptive learning provides many potential benefits, as seen in the survey feedback. AI customizing the learning experience for each student by adjusting content, pace, and delivery to their individual needs and preferences. This tailored approach can greatly improve learning outcomes by providing personalized instruction tailored to each student's requirements, moving away from a generic teaching method. Students' answers complete teachers' answers in the questionnaire where they insisted that AI affects students' engagement and learning outcomes, especially in terms of customization, effective evaluation, and enhanced student results. As technology progresses, the incorporation of AI in education could become more widespread, providing chances to enrich the learning process and boost students' achievements.

Moreover,all teachersconfirmed that their students use AI tools for studying. The widespread use of AI tools by students is a notable advancement that showcases the integration of technology into education. This shift mirrors the changing educational environment, where students are utilizing AI to boost their academic endeavors and potentially enhance their overall learning

experience. Nonetheless, it is vital to objectively analyze the implications and factors associated with this trend.

As a result, the second hypothesis, which states that integrating artificial intelligence into adaptive learning systems will enhance students' engagement and learning outcomes, is proved to be true. When students receive learning materials and activities that align with their individual needs and preferences, they are more likely to stay engaged and motivated. AI can help achieve this by continuously adjusting the content, pace, and presentation style based on the student's interactions and performance.

Implications of the Study

The research outcomes have a vital role in the field of educational technology and adaptive learning systems. By demonstrating the benefits of incorporating AI into adaptive learning platforms, such as enhanced personalization, instant feedback, and automated content selection, this study stresses the significance of further investing in AI-driven educational tools. Educators and instructional designers can leverage these AI capabilities to craft more interactive, adaptable, and efficient learning experiences customized to each student's needs and abilities.

Besides, the smooth integration of AI proposed by the findings could address challenges encountered by teachers, like handling large class sizes or supporting students with varying learning preferences. AI-driven adaptive systems could act as supplementary tools, providing tailored instruction, focused practice tasks, and ongoing evaluation without overwhelming human educators.

However, ethical aspects of integrating AI in education require careful examination. Concerns regarding data privacy, algorithmic bias, and the risk of dehumanizing the learning process need to be addressed through strong governance frameworks and transparent AI development practices. Nonetheless, this study presents a strong argument for further exploring how AI can enhance adaptive learning methods while managing associated risks.

In essence, the findings of this research highlight the significant impact of artificial intelligence in transforming how we approach personalized education on a large scale. By combining human

expertise with AI-driven adaptivity, we have the potential to establish more inclusive, engaging, and successful learning environments for students across all levels and subject areas.

Limitations of the Study

During the course of this study, several struggles were encountered that posed challenges to execution and outcomes. Firstly, a significant limitation was the limited knowledge of adaptive learning among both teachers and students. This lack of familiarity could have impacted the depth and quality of responses received. Then, the low survey participation rates from students and teachers, particularly with a majority of teacher responses being from those associated with teachers, introduced a challenge in obtaining a diverse range of perspectives. Additionally, the vast amount of information and sources available on adaptive learning might have made it difficult to sift through and extract relevant data effectively.

Despite the challenges encountered by the researcher during the study, they persevered and successfully completed the work, obtaining the necessary results to address the hypotheses and research questions previously outlined.

By acknowledging and reflecting on these obstacles, the study's limitations and their potential influence on the outcomes can be identified. This open discussion of the difficulties faced contributes to the overall integrity of the research, fostering transparency and deepening the comprehension of the study's findings.

Recommendations

According to the above-mentioned findings, a number of recommendations are made for Both Learners and teacher:

For Teachers:

- Utilize AI-driven adaptive learning platforms: Incorporate AI-powered adaptive learning tools to customize the learning experience for each student based on their unique characteristics.
- Employ AI for data-driven insights: Utilize AI to analyze student data and offer insights that can guide instructional strategies and pinpoint areas requiring additional support.

- Integrate AI-supported grading and feedback: Implement AI for grading tasks, delivering personalized feedback, and identifying improvement areas, easing the teacher's workload and enabling focus on higher-level responsibilities.
- Explore AI-generated content: Utilize AI to create tailored learning materials, quizzes, and exercises to suit individual student needs, ensuring content relevance and engagement.
- Engage in professional development: Pursue opportunities for professional growth to understand effective AI utilization in education and its integration into teaching methodologies.

For Learners

- Embrace personalized learning journeys: AI-driven adaptive systems can tailor learning paths to match your strengths, weaknesses, and preferences, enabling you to learn at your pace and in a manner that aligns with your requirements.
- Utilize AI tutoring and feedback: AI-powered virtual tutors and feedback mechanisms offer immediate assistance, answering queries, and providing personalized feedback to enhance comprehension.
- Employ AI for self-evaluation: AI can assess your performance and offer valuable feedback, helping you pinpoint areas for improvement and monitor progress over time.
- Explore AI-generated educational materials: AI-created resources like customized exercises, quizzes, and simulations can complement your learning and reinforce understanding of the subject matter.
- Cultivate AI literacy: With AI's growing presence in education, it's crucial to grasp how AI functions and effectively utilize AI tools and resources for learning purposes.
- Remember, AI in education is designed to supplement rather than replace human teachers, aiming to enhance the learning process. Striking a balance between leveraging AI's capabilities and preserving the human element fosters a collaborative learning environment for improved educational outcomes.

Suggestions for Further Research Studies

To summarize the recommendations for researchers exploring the role of artificial intelligence in adaptive learning:

1. Investigate a variety of AI techniques like machine learning algorithms, natural language processing, and knowledge representation for developing adaptive learning systems. Evaluate their strengths, weaknesses, and applicability in different learning contexts.
2. Utilize AI to create personalized learning experiences by modeling individual learners' knowledge, skills, preferences, and learning styles. Explore methods for learner profiling and adjusting content dynamically based on learner characteristics.
3. Use AI for analyzing significant amounts of learner data to understand learning patterns, pinpoint challenging areas, and make informed decisions for adaptive content delivery and instructional strategies.
4. Integrate AI technologies into intelligent tutoring systems to offer personalized feedback, guidance, and support to learners based on their current knowledge levels and learning progress.
5. Investigate how AI can combine different learning methods like text, audio, video, and virtual/augmented reality in adaptive learning, tailoring the most effective method for each learner or learning goal.
6. Analyze how AI can support collaborative and social learning by suggesting peer partnerships, identifying knowledge gaps, and encouraging productive discussions among learners.
7. Examine the ethical implications of AI-driven adaptive learning systems, including biases, privacy concerns, and transparency issues, and establish guidelines for responsible and ethical AI use in education.
8. Conduct practical studies to evaluate the effectiveness and user experience of AI-driven adaptive learning systems in various educational settings and learner populations.

It is also advisable to collaborate with educational experts, instructional designers, and practitioners to ensure that the research aligns with real-world educational needs and practical considerations.

These suggestions can serve as starting points for further research in the field of analyzing the role of artificial intelligence in adaptive learning, offering opportunities to explore new approaches, and contribute to the existing body of knowledge.

Conclusion

Integrating AI into adaptive learning platforms has the power to revolutionize education by providing personalized learning experiences tailored to each student's distinct needs, learning preferences, and performance metrics. AI-based systems can leverage smart tutoring, learning analytics, and predictive modeling to dynamically adapt content, pace, and instructional approaches. They can also simplify assessment procedures through automated grading, natural language processing, and intelligent question generation, offering instant feedback and identifying areas where students require assistance.

However, The use of AI in adaptive learning comes with challenges like data privacy, biased algorithms, and ethical issues in automated educational decisions. To succeed, it needs investments in tech, educator training, and curriculum. Going forward, ongoing research and collaboration among educators, tech experts, and policymakers are key for the ethical integration of AI in learning systems. This will enhance education inclusivity and student success in the digital age.

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APPENDICES

Appendix A

Students' Survey

I'm conducting this survey for my master thesis within Chadli Ben Djdid University. Please take the time to read the questions and answer them honestly. All responses will be treated anonymously for academic purposes. Thank you for your valuable time and contribution.

Question 1: To what extent familiar are you with artificial intelligence?

a) Very familiar

b) Somewhat familiar

c) Not familiar at all

Question 2: What comes to your mind when you think about AI in education?

…….

Question 3 : In what ways do you think AI can revolutionize the future of education?

……..

Question 4 : Have you ever used any adaptive learning platforms or tools?

a)Yes

b)No

What for?.....

Question 5 : Do you believe that artificial intelligence can enhance the learning experience?

a)Strongly agree

b)Agree

C)Neutral

d)Disagree

e)Strongly disagree

Question 6 : Are you currently using any AI-BASED tools or applications to support your learning? Justify

……

……

Question 7 : In your opinion, what are the potential benefits of using AI in adaptive learning?

a)Personalized learning experience

b)Improved student engagement

C)Efficient content delivery

d)Real-time feedback and assessment

e)Other (please specify)

Question 8 : Would you be open to using AI-powered adaptive learning tools in your studies?

a. Yes, definitely
b. Yes, if proven effective
c. Not sure
d. No, I prefer traditional methods

Question 9 : How do you think AI can personalize the learning experience for students?

e. Customized content recommendations
f. Adaptive assessments and feedback
d) Tailored pacing and difficulty level
e) Other (please specify)

Question 10 : In your opinion, what are the potential limitations or drawbacks of relying heavily on AI in adaptive learning?

……

……..

Question 11 : How important do you think it is for educators to have a good understanding of AI when implementing it in the classroom?

……

……

Question 12 : How does artificial intelligence contribute to adaptive learning?

A. Personalizing learning experiences based on individual needs and progress.

B. Providing real-time feedback and support to enhance learning outcomes.

C. Analyzing data to identify patterns and optimize learning strategies.

D. All of the above.

Question 13 : What are the potential challenges of using AI in education?

E. Ensuring data privacy and security.

F. Addressing biases in AI algorithms.

G. Preparing educators for AI integration.

H. All of the above

Question 14 : How can AI be utilized in collaborative learning environments?

I. Facilitating group discussions and collaboration.

J. Supporting virtual teamwork and project management.

K. Providing intelligent tutoring and peer-to-peer learning.

L. All of the above.

Question 15 : Do you have any suggestions or ideas on how AI can be effectively integrated into education system?

……

……

Suestion 16 : Do you have any concerns or reservations about using AI in adaptive learning?

……

……

Question 17 : Do you believe AI can replace human teachers in the future?

A) Yes

B) No

C) Not sure

Question 18 : Do you have anything else would you like to share about your views on AI in adaptive learning?

……

……

Appendix B

Teachers' questionnaire

Dear teachers,

This Questionnaire is designed to analyse the role of artificial intelligence in adaptive learning. Your answers will provide us with better understanding about this topic .

We extremely appreciate your contribution.

Thank you in advance

"Adaptive learning refers to a type of learning where students are given Customized resources and activities to adress their unique learintelligence."

Question 1 : Are you familiar with the concept of adaptive learning and how it utilizes artificial intelligence?

a) Yes, I have a good understanding of it

b) I have heard of it, but I'm not entirely sure how it works

c) No, I'm not familiar with adaptive learning or its connection to AI

Question 2 : Have you had any experience implementing adaptive learning technologies in your classroom?

d) Yes, and it has made a significant impact on student engagement and achievement.

e) Yes, but I found it difficult to integrate into my existing curriculum.

f) No, but I'm interested in learning more about how it can benefit my students.

g) I have used some adaptive learning tools, but I'm still exploring different options.

h) I haven't used adaptive learning technologies, but I'm open to trying them in the future.

Question 3 : Have you noticed whether your students use artificial intelligence tools for their study?

A) Yes

B) No

C) I don't know

Question 4 :your university use Technology for administrative tasks (students registration, grades , absences,…etc)?

D) Yes

E) No

F) I don’t know

Question 5 : Do you believe that artificial intelligence can enhance the effectiveness of adaptive learning for students?

i) Yes, AI has the potential to personalize learning experiences

j) No, I think traditional teaching methods are more effective

k) Unsure, I would like to learn more about AI in adaptive learning

Question 6 : What concerns or challenges do you foresee in implementing artificial intelligence in adaptive learning?

l) Ensuring that AI tools enhance, rather than replace, the role of the teacher.

m) Balancing the use of AI with other teaching strategies to create a well-rounded learning experience.

d) Providing sufficient training and support for teachers to effectively integrate AI into their teaching practices.

n) Promoting critical thinking and problem-solving skills alongside the use of AI technologies.

o) Ensuring that AI tools provide accurate and reliable feedback to support student learning.

Question 7 : In your opinion, what role should teachers play in an AI-driven adaptive learning environment?

p) Facilitating student engagement and motivation

q) Providing guidance and support based on AI-generated insights

r) Collaborating with AI systems to design personalized learning paths

s) Other (please specify)

Question 8 : How do you think artificial intelligence can benefit teachers in terms of instructional planning and assessment?

t) Providing data-driven insights on student progress and learning gaps

u) Generating personalized learning resources and materials

v) Streamlining administrative tasks to save time

w) Other (please specify)

Qiestion 9 : Do you have any suggestions or ideas for improving the integration of artificial intelligence in adaptive learning environments?

……

……..

Question 10 : How comfortable are you with using AI-powered tools and platforms in your teaching practice?

x) Very comfortable, I actively seek out and use AI-powered tools

y) Somewhat comfortable, but I prefer traditional teaching methods

z) Not comfortable, I prefer to rely solely on traditional teaching methods

Question 11 : In your experience, what are the key benefits of using artificial intelligence in adaptive learning?

aa) Personalized learning paths for students

bb) Efficient assessment and feedback mechanisms

cc) Enhanced student outcomes and academic performance

dd) Other (please specify)

Question 12 : Have you encountered any challenges or limitations when using AI in adaptive learning? If so, please describe.

ee) Technical issues or difficulties in implementation

ff) Lack of training or support in using AI-powered tools

gg) Concerns about the accuracy or reliability of AI-generated insights

hh) Other (please specify)

Question 13 : How can AI assist in student assessment?

A) Automating grading and providing instant feedback.

b) Analyzing student performance data to identify areas of improvement.

B) Offering personalized recommendations for further study.

D)All of the above.

Question 14 : your opinion, what role should teachers play in guiding and supporting students' learning experiences when using artificial intelligence in adaptive learning?

……

……..

Question 15 : What types of data or feedback would be most valuable to you as a teacher when using artificial intelligence in adaptive learning?

……

……

Question 16 : Have you received any training or professional development opportunities related to incorporating artificial intelligence in adaptive learning? If yes, please describe the training and its impact on your teaching practice.

……

…….

Question 17 : What negative ways in which artificial intelligence put affect in adaptive learning?

……

…….

Question 18 : Would you like more guidance to enrich your knowledge and skills in using artificial intelligence tools in education?

C) Yes

D) No

E) I don't know