INVESTIGATING THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE STUDY HABITS AND LEARNING EXPERIENCES OF UNIVERSITY STUDENTS

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Abstract: **Artificial Intelligence (AI) has skilled fast improvements in latest years, revolutionizing diverse industries and factors of human life. However, the increasing integration of AI systems raises concerns regarding user experience, privacy and ethical implications. This study investigates the impact of Artificial Intelligence (AI) on the study habits and learning experiences of University students. Through semi-structured interviews with University students, the thematic analysis identified five main themes: AI as an aid in learning, Knowledge of AI usage, Efficiency, Trust, and AI in society and the workplace. The findings of the study will reveal that AI serves as a dynamic guide for students, aiding knowledge development, reflection, and discussions. However, concerns about cheating and short-term learning highlight ethical dilemmas. Students' familiarity with AI varies, with challenges in navigating technical aspects and formulating clear questions. Encouraging AI literacy and support can mitigate these challenges. AI is perceived as a time-saver, simplifying information search processes and providing additional resources. Ethical considerations, such as data privacy and reliability, must be addressed. Trust plays a pivotal role in students' interactions with AI, emphasizing transparency and reliability. Beyond the classroom, AI affects society and the workplace, necessitating in addition studies for a complete know-how of its results on gaining knowledge of consequences and educational success. Overall, AI integration in education is crucial, emphasizing needs to make sure students are getting good experiences and outcomes when using AI for learning.**

Keywords: **Artificial Intelligence, Education, Ethical, Experiences, Learning, Outcomes, Privacy, Students, Study, University.**

1. INTRODUCTION

The educational process can be improved by digital technologies such as artificial intelligence (AI), the Internet of Things (IoT) and other developments in the field of information and communication technologies (ICT) (OECD Education Working Papers, (Rosak-Szyrocka et al., 2024). "Artificial intelligence of intelligence" (AI) is presented as a way to improve education through more individualized, adapted, inclusive and challenging in the face of the abundance of real-time data (Big Data) (Bhutoria, 2022 Halagatti et al. .). Governments, the education sector and technology organizations have explored the introduction of AI tools and platforms to ensure that monitoring of the education system is more effective (with timely, accurate and informative indicators) and efficient (with less administrative burden) than in the current education. system. to achieve these benefits (Rosak Szyrocka, 2024). "The ability of a digital computer or a computer-controlled robot to perform tasks normally associated with intelligent beings" is the definition of artificial intelligence

(Vries, Bliznyuk, Pinedo, 2023). Artificial intelligence in education is one of the newest areas of educational technology, according to several global studies (Zawacki-Richter et al., 2019; Rosak-Szyrocka et al., 2024; Rosak-Szyrocka et al., 2022a). "A computer that performs cognitive functions typically associated with the human mind, especially learning and problem solving" is the general definition of artificial intelligence (Baker et al. , 2010). They clarify that the term AI does not refer to a specific technology. It is an umbrella term for a variety of tools and techniques, including algorithms, machine learning, data mining, neural networks, and natural language processing. Intelligent virtual reality, intelligent collaborative learning aids, and personal tutors are three types of AI software solutions in education that are now available (Holmes et al., 2022; Luckin, Holmes, 2016).

1.1 Background of the Study

Technology has completely changed the educational landscape, opening up new opportunities and posing new difficulties for approaches to teaching and learning (An & Oliver, 2021; Niu et al., 2022) . However, the mere presence of technology does not guarantee improved educational quality or academic outcomes. It is essential to define how digital tools can effectively support students in their studies (Lydia et al., 2023) . Therefore, each type of technology shaping the field of Edtech needs to be examined based on its specific characteristics (An & Oliver, 2021). One emerging technology that is reshaping the educational landscape is Artificial Intelligence (AI) (Ouyang et al., 2022) . AI has the potential to make predictions, decisions, and perform tasks in a human-like manner based on data (Popenici & Kerr, 2017; Williamson & Eynon, 2020). In the field of education, researchers argue that when AI is leveraged to its full potential, it can enhance human intelligence and learning processes (Popenici & Kerr, 2017; Williamson & Eynon, 2020).

Different forms of AI in Education (AIEd) have been created, including collaborative learning support systems and individualized tutors (Niemi, 2021; Zawacki-Richter et al., 2019) . As technology continues to reshape the educational landscape, there's a growing need to understand the impact of AI specifically on students' study habits and learning outcomes. This research aims to delve deeply into the role of AI as a study tool among Swedish university students. By exploring how AI tools are utilized by students to support their learning process, we can gain

valuable insights into their efficacy and potential impact on academic performance. Through qualitative exploration, this study seeks to uncover how AI tools are integrated into student's.

1.4 Objectives

This study's main goal was to find out how artificial intelligence (AI) affected university student's study habits and educational experiences. The purpose of the study was to investigate how students used AI tools to improve learning outcomes and study strategies. The study's specific goal was to identify trends, obstacles, and possibilities related to the use of AI in education. Important insights on the effectiveness of AI-driven learning tools and their impact on students' use of technology in the classroom were obtained through qualitative investigation. The goal of the research was to shed light on the role of AI in education and offer practical advice for educators, legislators, and technology developers on how to best utilize AI-driven learning Environments to enhance student achievement.

2. LITERATURE REVIEW

2.1 The Evolution and Impact of AI

Since the 1950s, artificial intelligence (AI) has been a growing field that constantly incorporates new strategies and tactics (Popenici & Kerr, 2017). Systems using AI are able to learn on their own and improve over time using data (Popenici & Kerr, 2017; Williamson & Eynon, 2020). This technology can simulate human behavior by performing tasks, making decisions, and making predictions. Today, artificial intelligence is an essential element of many commonly used digital devices, such as smartphones, smart home assistants, and cars (Popenici & Kerr, 2017). Due to its versatility and ability to handle a wide range of tasks, it is very useful for many applications, such as automation in factories and other industries around the world (Wärnestål, 2021).

According to Zawacki-Richter et al. (2019), openness is essential not only for decision-making, but also for addressing ethical issues, including bias and privacy. Popenici and Kerr(2017), for example, detail how Microsoft's Tay AI chatbot was shut down after just 16 hours of operation due to the biased data it was exposed to.AI affects users in addition to data and system trustworthiness. When AI systems process sensitive or private data, such as gender, race, or age, ethical

considerations become even more important (Ouyang et al., 2022). By adapting learning by interpreting students' emotions, emotional AI in education has ethical and legal ramifications that McStay (2020) examines. However, she draws attention to the fact that financial incentives often conflict with students' well-being, highlighting the need for further study. complementary to these moral and legal perspectives.Furthermore, many people are unaware of how much AI they are using or what it entails (Luckin & Cukurova, 2019; Williamson & Eynon, 2020). Due to uncertainty and anxiety about job loss, this lack of knowledge can lead to misuse or avoidance of AI technology (Fu & Zhou, 2020; Long & Magerko, 2020).

2.2 The Evolution and Role of AI in Education

The creation of intelligent teaching systems in the 1960s gave impetus to research in artificial intelligence in education (AIEd) (Williamson & Eynon, 2020; The discipline gained formal recognition in the 1980s and groundbreaking studies were published in the International Journal of AI in Education (Williamson & Eynon, 2020). believed that AI would change the way people learned, and this idea is still relevant in current debates (Niemi, 2021; Zawacki-Richter et al. , 2019).Although artificial intelligence (AI) has become more prevalent in the classroom, many teachers and students are still unaware of how it works (Zawacki-Richter et al., 2019).Concerns have also been raised about AI in educational institutions potentially replacing human workers (Popenici & Kerr, 2017; Zawacki-Richter et al., 2019). According to Zawacki-Richter et al. (2019), educational institutions can consider using AI to automate teacher responsibilities and save money.

2.3 Educational Technology

Advances in technology have enabled many improvements in educational experiences (Livingstone, 2012; Lydia et al., 2023). Edtech, or educational technology, is a rapidly developing field that encompasses a variety of learning theories in addition to useful digital tools (Hill and Hannafin, 2001). Learning is now available in traditional classrooms and at home through the integration of previously separate activities, including writing, speaking to people, and acquiring knowledge (Livingstone, 2012).Today, digital tools for work and communication are ubiquitous, including computers, calculators, and online communication platforms (Livingstone, 2012).

2.4 Challenges of AI

2.4.1 Data Challenges

Although AI has many advantages, it is essential to consider the challenges and obstacles of its implementation in a business. First, there is the problem of data. The volume and quality of data are essential for AI technologies to function as efficiently as possible, because AI relies on the data it collects to make predictions and judgments (Furano et al., 2020). There are a few more variables associated with data that can be problematic. First, there is the problem of volume. For AI technology to draw detailed and accurate conclusions, a large amount of data is required. When data collection is limited due to privacy and security issues, the question of whether companies have enough data is important (Furano et al., 2020).

2.4.2 Challenges with ChatGPT

When it comes to privacy ethics, there are several dimensions to consider in the case of ChatGPT. One dimension is related to the extensive data collection carried out by OpenAI, where information is extracted from the Internet without the consent of the people who provided the data or without giving any form of compensation. This raises concerns about a violation of privacy. Furthermore, the use of publicly available data outside its original context may also violate the integrity of the context. OpenAI also does not provide individuals with a way to control whether their personal information is stored or to request its deletion, which is a right guaranteed by the GDPR (Gal, 2023). Another dimension concerns the data that different users enter into ChatGPT. Sensitive information can be inadvertently entered, risking public exposure. This data becomes the property of ChatGPT and can be used to train the tool, potentially influencing the answers to other users' questions. Another privacy concern is that ChatGPT collects user information such as IP address, browser type, website interactions, and the type of content users interact with. In addition, Open-AI collects data about users' browsing activities over time, raising additional privacy and data protection concerns (Gal, 2023).

2.5 AI Possibilities

ChatGPT, a powerful AI tool, has tremendous potential to revolutionize education. One of its main advantages is its ability to facilitate discussions in larger groups, allowing all participants to immediately access answers to questions (Parnes, 2023). This promotes inclusive and equal participation, as students who might otherwise hesitate to ask questions can engage

with confidence. In addition,ChatGPT eliminates language barriers by enabling multilingual communication, thereby improving understanding between students from different backgrounds. different linguistic origins (Bozic, 2023).In addition to its role in discussions, ChatGPT has various applications in educational institutions. For students, it serves as a valuable resource for understanding complex concepts, providing support for writing, summarizing texts, and generating personalized study materials (Neumann et al., 2023). Teachers can use ChatGPT for lesson planning, developing exercises, generating responses, and providing feedback (Neumann et al. , 2023). These features simplify educational processes, saving students and teachers time while ensuring consistent and quality support.Additionally, the integration of ChatGPT into platforms such as Microsoft Teams and Bing expands its accessibility and usefulness (Parnes, 2023). By constantly being available to answer questions and provide assistance, ChatGPT contributes to equality among students, regardless of the availability of teachers or the reluctance of students to ask questions.

2.6 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a theoretical framework that seeks to explain how users accept and use a technology. Developed by Fred Davis in 1989, TAM has become one of the most widely used models for understanding the adoption and use of information systems and technologies. This model is particularly useful for studying the acceptance of new technologies in various contexts, including education, healthcare, and business. (Scherer et al., 2019).

The idea of the student life cycle is used in the context of higher education as a framework to explain many AI-based services at a more general institutional and administrative level, as well as to help the process of l teaching and academic learning. in a more targeted sense (Navajas et al. ,2024) (Fig.1)
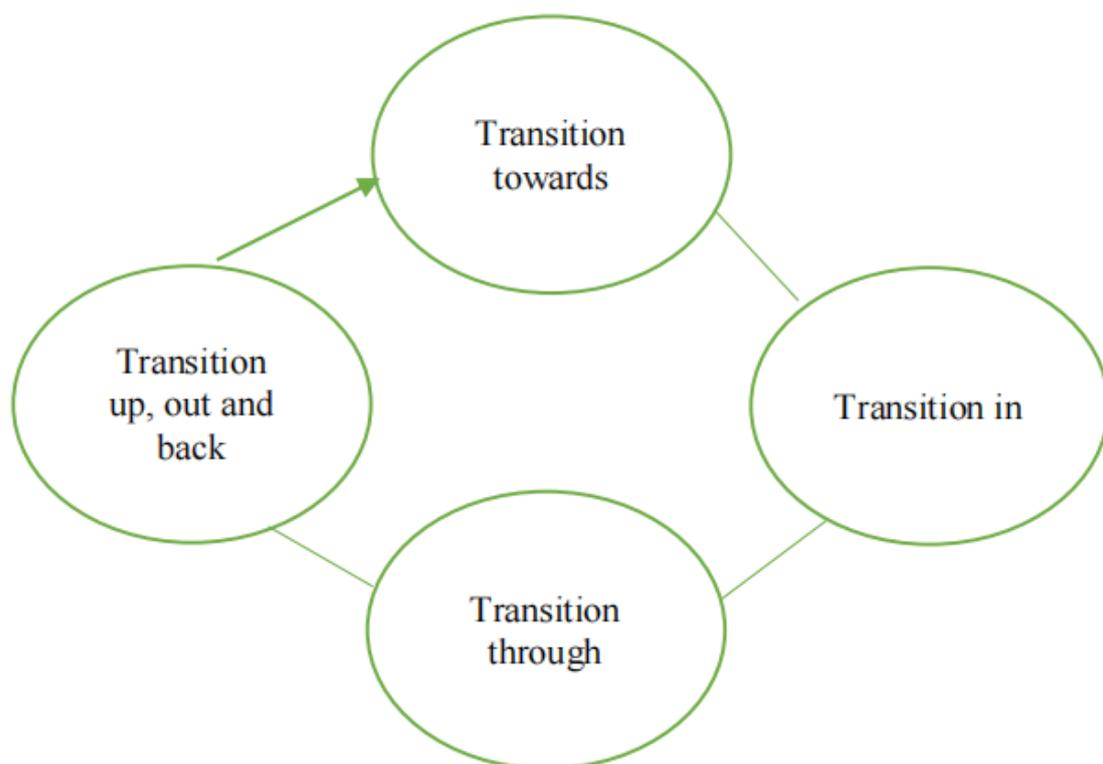

Figure 1. Student Life Cycle.

Source: Personal study based on: (Bates, Hayes, 2017).

The first stage, called transition to, is for students before they begin their studies and includes their goals and research before setting their course(Student Life Cycle ..., 2012). Transition is the second stage. Beginning students are dedicated to their studies in this stage. Transition, the third step, is to keep students in school. Students work towards academic success throughout this phase. The final stage, known as the up, out and back transition, is where graduates and graduates focus on their future success and how they can stay connected to the institution (Student Life Cycle ..., 2012).

Table 1. Examples of chosen review of recent research related to to AIEd.

Author(s) and year	Methods	Analysis aspects
(Hinojo-Lucena et al., 2019)	A bibliometric study of 132 scientific papers on artificial intelligence in higher education, which were indexed between 2007 and 2017 in the Web of Science and Scopus databases.	The objective of this study is to examine the current state of production, examine the correlation between the number of authors and publications, and identify the main sources, authors, organizations, and nations that have produced the most scientific research on artificial intelligence in higher education.
(Garg, 2020)	Position Paper: Guidance for Medical Educators to Ensure Adequate Preparation for AI.	To help medical educators prepare for new opportunities and demands,this section will describe the general ideas of artificial intelligence (AI), discuss how AI is affecting medicine, and highlight how AI is directly influencing the style and content of medical education.
(Zhai et al., 2021)	A total of 100 publications were selected from the educational and educational research category of the Social Science Citation Index database between 2010 and 2020. Of these, 63 empirical articles (74 studies) and 37 analytical articles were included.	The study proposed a content analysis of research articles to explore the ways in which artificial intelligence (AI) has been used in the field of education and to investigate future directions and obstacles for research inAI. in this area.
(Sanusi et al., 2022)	A total of 605 students provided informed responses to the WarpLS software survey. To understand the relationships between the selected variables used in the research, structural equation modeling was conducted.	Using data from Nigerian secondary school students, the study examines the skills required to be AI literate, while accounting for gender variance and school ownership type.

3. METHODOLOGY

3.1 Research Method

Semi-structured interviews were used in this study to explore how students interact with artificial intelligence. With this method, a predetermined list of questions was used, but it was also flexible enough to allow for follow-up questions and additional probes based on the participants' responses. It allowed researchers to gather rich qualitative data and nuanced perspectives. The participants had the opportunity to discuss their experiences and perspectives with AI through semi-structured interviews. Qualitative research presents benefits but also challenges. The approach allows for in-depth investigation and insight into students' interactions with digital technology and AI, despite the challenge of extrapolating findings to wider populations (Bryman, 2018).

3.2 Population, samples and respondents

I contacted representatives who I knew well and who were free at the time, extending an invitation to participate in the research. I tried to find a balance between participants who were available for the study and strategically important by combining these two sampling techniques.

Twelve respondents in total, including the pilot interview that was conducted, will constitute the sample(see Fig 2). As empirical saturation was achieved, this sample size was considered sufficient for further research. The age of the respondents ranged from 22 to 30 years, with a slight bias towards young people. There were five women and seven men among respondent. In terms of their academic background, four of the respondents studied economics, and the other five studied media, digital design, and civic economics. The interviews took place on campus and lasted from twenty-five to forty-five minutes. The respondents used ChatGPT as one of their AI tools.

3.3 Data processing and statistical analysis

Thematic analysis was used to collect and examine the empirical data of the study. Making inferences or developing ideas from patterns and themes found in the results of an empirical study is known as the inductive method (Bryman, 2018). Knowledge that can be used in different contexts is developed through the application of these themes and patterns. Thematic analysis of the study was conducted methodically using the six processes that Braun and Clarke (2006) describe for thematic analysis in qualitative research. All interviews should be transcribed to develop a solid understanding of the empirical material for thematic analysis (Braun & Clarke, 2006). Therefore, the research interviews were written and the empirical data collected were then enriched by adding brief explanations to the interview sentences. Similar codes can be collected and categorized using codes based on relationships or commonality. After iterating through these groupings and categories, five main themes and three sub-themes were developed that capture key elements of how students view AI as a study aid:

1. AI as a useful resource in learning

1. 2 The dynamic guide

1. 3 Risk of cheating and knowledge reduction

2. Knowledge on the use of AI

2. 1 Student knowledge

3. Efficiency

4. Confidence

5. AI in society and at work

3.4 Pilot study

To assess the effectiveness of the interview guide, the first interview conducted for the study served as a pilot interview. A pilot interview aims to identify issues or limitations associated with the original interview guide structure so that modifications can be made before. conducting additional interviews (Bryman, 2018). It became clear during the pilot interviews that the interview guide was not flexible enough, mainly because some questions overlapped when the participant spoke. Therefore, some questions from the guide were removed to promote better dialogue and increase adaptability. The question "Which learning environment do you prefer?" was rephrased to address this topic more broadly, under the heading "How does the environment affect your learning?" The pilot interviewee was also a bit different from the rest of the sample because, in their advanced studies, they had not used AI much beyond simple tasks such as automatic word correction. However, despite this difference, there are important parallels between the study's pilot interview and the follow-up interview.

Table of Empirics - Respondents

Study object:	Gender:	Age:	Time:	Meeting:	Program
Interview A	Woman	25	30 min	Campus	Digitaldesign
Interview B	Woman	23	32 min	Campus	Digitaldesign
Interview C	Man	27	25 min	Campus	Economy
Interview D	Man	25	27 min	Campus	Civil economist
Interview E	Woman	22	33 min	Campus	Digital business development
Interview F	Man	23	38 min	Campus	Economy

Figure 2: Table of Respondents

Interview G	Man	25	30 min	Campus	Media and communications
Interview H	Man	23	36 min	Campus	Economy
Interview I	Man	24	45 min	Campus	Economy
Interview J	Woman	26	42 min	Campus	Media and communications
Interview K	Man	30	42 minutes	Campus	Digitaldesign
Interview L	Woman	28	40 minutes	Campus	Digitaldesign

3.5 Validity and Reliability

To ensure the reliability of this study, it was crucial to create a comfortable environment during the interview and to allow the participants to express themselves freely. To achieve high validity, it was necessary to be transparent by detailing the selection process, the data collection and the analysis process as fully as possible, without leaving room for ambiguity. When doing a thematic analysis, it was important to include examples of coding or how themes emerged to allow readers to understand the analysis process. I think it is essential to ensure that the approach, from data collection to results, is perceived as transparent, thus allowing other researchers to replicate and extend the current study.

4. RESULTS AND ANALYSIS

4.1 AI as an Aid in Learning

The analysis and findings from the study demonstrate how artificial intelligence (AI) serves as a dynamic guide for students, a notion corroborated by research in the field of Artificial Intelligence in Education (AIEd). According to research by Williamson & Eynon (2020) and Zawacki-Richter et al. (2019), AIEd has evolved to enhance students' learning experiences by offering personalized tutoring systems or dynamic collaboration tools. This technology can adapt tutoring based on factors such as students' knowledge levels or learning preferences (Niu et al., 2022; Zawacki-Richter et al., 2019).

4.2 Knowledge of AI Usage

Respondents described AI as a challenging technology to understand. About half of the respondents indicated they have some knowledge of how AI works, though they do not fully grasp its technical construction. These respondents tended to use AI tools with more confidence compared to those with lower understanding.

4.3 Efficiency

The insights provided by respondents underscore the efficiency gains facilitated by AI tools in their academic pursuits. Respondents highlighted that AI tools, such as ChatGPT, contribute significantly to their studies by expediting information retrieval and granting access to additional knowledge. They emphasized the convenience of accessing AI tools via the internet, enabling seamless integration into their study routines, whether at home or on campus. This accessibility fosters flexibility in their learning approach, aligning with contemporary demands for adaptable study practices.

4.4 Trust

In examining respondents' perceptions of AI tools within the educational sphere, it becomes apparent that trust plays a central role in shaping their interactions and reliance on these technologies. The sentiments expressed by respondents not only shed light on their individual experiences but also resonate with broader discussions within scholarly literature.

Respondents' expressions of trust in AI tools mirror the findings of Williamson and Eynon's (2020) study, which underscored the increasing integration of AI technologies in educational settings. This alignment suggests a growing acceptance and reliance on AI as a valuable resource for supporting learning and academic endeavors.

4.5 AI in Society and the Workplace

Respondents' perspectives on the increasing importance of AI in society and the workplace align closely with scholarly discourse, shedding light on both the pervasive nature of AI and its multifaceted impact on various aspects of daily life. This section synthesizes respondents' insights with relevant literature to provide a comprehensive analysis of the role of AI in contemporary society and the workplace.

Respondents' accounts underscore the omnipresence of AI in their lives, emphasizing its utility across diverse domains, including education, work, leisure, and communication. As articulated by Respondent A, "AI helps you, you can ask it questions... um, you can ask Google, for example, or you can ask Siri or whatever. So, it's, like, all around you." This sentiment resonates with the findings of Popenici and Kerr (2017), who highlight AI's integration into everyday digital tools, such as mobile phones and smart assistants, underscoring its pervasive influence.

4.6 A Thematic Analysis

A thematic analysis was used to assemble and examine the study's empirical data. Making inferences or developing ideas from patterns and themes found in the results of empirical study is known as an inductive method (Bryman, 2018). Knowledge that can be used in different contexts is developed through the application of these themes and patterns. The

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study's topic analysis was carried out methodically using the six procedures Braun and Clarke (2006) outlined for thematic analysis in qualitative investigations.All of the interviews have to be transcribed in order to develop a solid comprehension of the empirical material for the thematic analysis (Braun & Clarke, 2006). Consequently, the research interviews were written down, and the collected empirical data was then enhanced by appending brief explanations to the interview sentences.

Similar codes could be gathered and classified using the codes according to relationships or commonalities. After these groupings and categories were repeated, five major themes and three sub-themes that capture key elements of how students view AI as a study aid were developed:

1. AI as an aid in learning

1.2 A dynamic guide

1.3 Risk of cheating and reduced knowledge

2. Knowledge about the use of AI

2.1 Students' knowledge

3. Efficiency

4. Trust

5. AI in Society and the Workplace

An example of the thematic analysis process is presented in Table 3.

Table 3. Example of the process in thematic analysis

Transcription	Coding	Category	Theme
Since I can put this on a computer and then I can go to another computer and do something else so it's like... I've found a new time to do something else Efficiency	AI provides new time	Time-saving	Efficiency

5. CONCLUSION

In this study, ethical considerations regarding confidentiality, consent, integrity and voluntary participation were considered, in accordance with the four main requirements for research in the humanities and sciences published by Vetenskapsrådet (2002). All involved, including the interviewed students, received clear information about the purpose of the study and the conditions of participation. In addition, emphasis was placed on the voluntary nature of participation, emphasizing that the participants' freedom to leave the study at any time would not affect their status in the organization. By providing respondents with information about the purpose of the study, their freedom to refuse participation, and the ability to withdraw at any time while the study is ongoing, consent and information requests are the summer. satisfied. Potential respondents received an information letter prior to data collection .An explanation of the purpose of the study and instructions for participation were included in the information letter. The consent form that participants can complete if they wish to participate in the study.

This study delves into how Artificial Intelligence (AI) affects the study routines and learning journeys of students. By analyzing various themes, The study have uncovered some important insights into how AI is shaping education. It also focuses on the need and importance for AI enterprises to push privacy and data protection and security compliance to the front and center of AI and software development by implementing privacy and security by design and ensuring that their AI and software possesses the structural methodologies for protecting the privacy and security of data of the users and is meeting the security requirements of software engineering.

6. ACKNOWLEDGEMENT

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