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PAPER

Navigating AI in Education: Mobile Access, Opportunities, and Challenges in High Schools

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ABSTRACT

The effect of artificial intelligence (AI) in teaching is a vital topic, as it can enhance learning and teaching. Therefore, schools began developing AI policies and exploring ways to integrate AI applications into teaching practices. The present study aims to explore the effect of AI on high school students. One hundred ninety-eight students responded to a survey developed to collect their opinions on how they see the use of AI in schools. The results showed that they were aware of some advantages of utilizing AI tools, such as increased productivity, regardless of doubts about accuracy. Additionally, 80% stated that AI tools can increase academic productivity, and 65% indicated that they helped understand complex topics. ChatGPT was the most frequently used AI tool, and while many students indicated that AI could enhance academic performance, some challenges appeared in its efficiency compared to traditional methods. Moreover, results showed that students chose to use AI tools on mobile devices because of convenience, fast explanations, mathematical assistance, and accessibility of mobile devices accessibility. In providing support, mobile access to AI tools has also presented challenges, such as minor screen size restrictions and occasional inaccuracies. The current study complements the growing body of evidence on integrating generative AI within educational environments, outlining its capability in providing innovative and creative learning experiences. The study also presents some implications for educators and policymakers to make guidelines and training programs that ensure the proper and ethical integration of AI tools.

KEYWORDS

artificial intelligence (AI), generative AI, ChatGPT, ethical considerations

1 INTRODUCTION

Artificial intelligence (AI) emerged as a groundbreaking learning tool that fosters creativity, critical thinking, and hands-on learning. AI is more than just a tool; it is commonly viewed as enhancing human efficiency, accuracy, and safety in performing routine tasks [1]. It can turn what was once considered impossible into a reality in classrooms, expanding many capabilities [2]. Therefore, educators need

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to understand what AI entails, understand how students currently utilize it and its potential applications, recognize its ability to simplify their tasks, and acknowledge that pedagogical objectives that were once considered unattainable can now be achieved.

A meeting was conducted with teachers at the school in the context of this study to discuss the use of AI and draw up the policy on it. This meeting revealed different views on integrating AI into learning institutions. Concerns have been raised about the impact of AI on students' critical thinking. In other words, AI tools may decrease students' ability to think independently and creatively. The teachers also pointed out that both students and teachers became overdependent on technology, which diminished the teacher as a major provider of information. Also, there were apprehensions about the trustworthiness and bias of the AI-generated data, highlighting the responsibility of educators regarding the use of AI. There were also ethical issues brought up, for example, how to use AI appropriately. Other concerns about privacy, inappropriate content, and the need to block some sites and approved site lists were also highlighted.

As AI technologies progress and become widespread, educators should be ready to provide instances of effective AI incorporation in education and address concerns [3]. This study has practical significance for educators and policymakers, featuring recommendations for integrating generative AI tools in K-12 schools. Understanding how students engage with these tools is critical for educators, who can use the data to adapt their teaching and learning methods according to the changing student needs [4]. In addition, the findings of this study can contribute to the support of school leaders and policymakers in creating AI policies and guidelines. Also, the study findings can offer insight for designing professional development programs to ensure educators are prepared with the necessary skills and knowledge to integrate AI into their educational landscape. Overall, the study is significant because it includes the voice of students, which researchers sometimes overlook. teaching and learning.

1.1 Research problem

Integrating AI into educational processes has become more robust globally day by day [5], calling for the incorporation of AI tools in Kuwaiti education as well. Recent advances in AI technology have sparked a wave of new AI tools, signaling the immediate need for general education on fundamental concepts and implications of AI for our present generation [6].

However, research on integrating AI in K-12 schools is still in its early stages [7], and there is a gap in understanding how high school students perceive these changes, mainly how they evaluate the opportunities and challenges AI poses in their educational experience. This study addresses that gap by centering on high school students' perspectives. It explores whether and how these students use AI technology in their academic lives; it also explores what benefits they perceive, the integration of AI technologies offers, and possible concerns.

The main research question is addressed through the following sub-questions:

1. How do high school students in Kuwait perceive the benefits of utilizing AI tools in their education?
2. In what ways do students compare the effectiveness of AI tools to traditional learning methods?

3. What is the impact of introducing AI tools on students' academic performance and outcomes?
4. What challenges or drawbacks do students experience when using AI tools for their studies?
5. What recommendations or suggestions do students propose for optimizing AI tool integration in their education?
6. How do high school students perceive advantages, encounter challenges, and propose improvements for AI tools on mobile devices to inform the effective design and pedagogically valuable mobile-based learning experiences?

This study uses five sub-questions to understand students' views. Also, this study aims to provide information regarding educational practices that can create background knowledge for using AI practices in Kuwaiti schools. The following section begins with a literature review, which serves as some background work for approaching the issue of AI in education.

2 LITERATURE REVIEW

As technology becomes integrated more frequently into education, AI stands out as a transformative force shaping the future of learning [8]. Amidst the ongoing technological revolution, Shah's insights, presented in his recent book, *AI and the Future of Education: Teaching in the Age of AI* [2], emerge as a guiding light. According to Shah [2], AI is not another passing trend but an essential and sustainable pre-investment for the coming years. As the field of education continues to evolve, it is essential to understand the scope and significance of emerging technologies such as artificial intelligence.

2.1 Challenges and implications

Artificial intelligence integration into K-12 education promises to improve educational paradigms while presenting notable challenges [9]. Concerns have been raised about the potential threat to human creativity, with some arguing that relying on prompts for text or image creation may devalue the creative process [10]. Borasi et al. [11] identified a focus of school leaders on several priorities, as well as support, stakeholder empowerment, and the enhancement of technological tools. These priorities highlight the barriers to technology integration in educational environments and underscore the importance of leadership and supportive standards.

Similarly, Crompton et al. [12] identified several challenges in AI education within K-12 settings, including negative perceptions, lack of student and teacher technology skills, ethical concerns, and usability and design issues of AI tools. This illustrates the complexity of integrating AI in education and the challenges associated with multiple stakeholders' needs and demands. It is crucial to identify both the potential advantages and obstacles of integrating new technologies by exploring the challenges and consequences in schools. In their study, Pan and Lan [13] elaborated on the challenges of AI in education, pointing out the lack of a common curriculum, the availability of suitable learning resources, instructor qualifications, and the learning environment where the course is conducted. These challenges emphasize

developing targeted strategies to address the issues and establish relevant AI education programs.

2.2 Implications

In their study on the impact of AI on K-12 learning, Akgun and Greenhow [14] highlighted the ability of AI to facilitate both social and cognitive development among learners while presenting compelling ethical and societal concerns. This validates the importance of establishing ethical strategies for supporting educators in integrating technology into pedagogical approaches. In another study, [15] highlighted the importance of educational frameworks in K-12 settings that develop students to engage with and possibly innovate digital technologies, such as AI applications. As a result, integrating AI into learning environments can prepare learners for future demands and cultivate the skills required for the future.

2.3 Previous studies

Baggio [16] highlighted the huge potential of AI for transforming pedagogical practices and enriching educational experiences through new uses of data. He emphasized the importance of creative instructional strategies and research into learning sciences and environments needed to harness the potential of AI in teaching and learning contexts. A study highlighted the initiatives taken by the Indian Central Board of Secondary Education (CBSE) in using AI in education. Recognizing the extensive implications of AI, the CBSE has developed a comprehensive AI integration manual outlining strategies for incorporating AI into teaching and learning processes.

This study employed thematic analysis to investigate the potential of AI in K-12 education, focusing on CBSE's efforts. Findings indicated that the CBSE approach has involved two initiatives: introducing AI as a standalone subject and integrating AI as a parallel pedagogical approach for teaching multiple multidisciplinary subjects.

The study conducted among high school students showed their positive perception of AI tools in education, and they agreed on the usefulness of these tools for tasks such as seeking information, idea generation, and raising productivity.

Karan and Angadi [17] conducted a systematic review examining the risks of AI integration in K-12 education. Their study identified six major risk areas, including a lack of privacy, biased systems, issues with accuracy, and challenges in shifting teacher roles, hence bringing forth the complexities of integration into an educational setting. Furthermore, Antonenko and Abramowitz [18] examined teachers' perspectives on integrating AI into K-12 science education. They highlighted the need for teacher training and professional development to incorporate AI tools into the curriculum effectively. Similarly, Chai et al. [19] investigated factors affecting students' behavioral intention to continue AI learning, identifying AI literacy, confidence in AI, and the perception of AI for social good as significant predictors of students' intention to engage in AI learning. However, while these studies have primarily focused on educators' perspectives and the challenges of adopting new technologies, there is still a lack of understanding regarding the direct benefits for students from the students' viewpoints. This study addresses that gap by centering student perspectives on AI tools. In contrast, most previous research has centered on

the educator's or institution's views, therefore filling a significant gap in understanding the influence of AI on learners' experiences.

In a study by Borasi [11], researchers interviewed 36 school leaders from Western New York to explore their perspectives on technology in education. The leaders expressed four primary needs: 1) clear guidance for making informed decisions; 2) a better understanding of new technologies, and awareness of their implications; 3) to use AI to support teachers and staff effectively; and 4) needed improved technology solutions related to AI [11]. The present research addresses the gap by shifting the focus toward school students, building on insights from existing literature while providing a student-centered perspective on integration in education.

3 RESEARCH METHODOLOGIES

In this study, a survey was employed to explore the impact of AI on high schools. Inspired by Yin's [20] case study methodology, this study investigates the current phenomenon of AI integration in an educational context, using a survey instrument to collect qualitative and quantitative data for empirical investigation. A mixed-methods approach was employed to capture quantitative insights and the depth of qualitative perspectives, allowing for an understanding of students' experiences using AI tools.

Following Creswell's [21] methodology, the questionnaire was designed to include questions to collect qualitative inputs, allowing students to share their experiences. This method is consistent with the study's exploratory nature, which seeks to explore the 'how' and 'why' questions concerning the role of AI in education. According to Cohen [22], 'Surveys gather data at a particular time to describe the nature of existing conditions or identify standards against which existing conditions can be compared or determine the relationships between specific events.

Triangulation [22] was incorporated within the survey design to enhance research validity. This combined closed-ended questions for quantitative analysis and open-ended questions for qualitative insights. The methodological approach was designed to increase the validity of the results through cross-verification of data from various dimensions. In the 2024 school year, we conducted this mixed-use research study on high school students using an online questionnaire as the primary tool. This method was practical and efficient for collecting data, ensuring responses were standardized to provide further reliability and comparability. A distribution strategy aimed to maximize participation and capture diverse perspectives through school emails and in-class dissemination over five weeks. The survey closed upon reaching a preset number of responses. All the data were exported into an Excel file to make the data analysis process easy and reliable.

3.1 Sampling

The study adopted a purposive sampling strategy to select high school students with firsthand AI tools. The purposeful sampling was chosen to allow for a range of responses on using these technologies within educational settings. Purposive sampling was incorporated to allow for inclusivity of the students who have experience with AI tools and thus ensure that the study becomes diverse across diverse grades and demographics. The survey was administered to 198 high school students who gave

a balanced response mix and diversity across various grades. The sample was composed of 48% females and 52% males. By distribution by grade, the sample included 52 ninth graders, 91 tenth graders, 40 eleventh graders, and 15 twelfth graders.

3.2 Data collection

Data was collected through an online survey questionnaire to address the research inquiries. This survey functioned as an instrument for acquiring insights into students' experiences, perceptions, and attitudes regarding AI tools within the context of their educational journeys. The questionnaire, developed using Google Forms, comprised 18 questions systematically categorized into four sections. It was disseminated via emails and administered in classrooms over four weeks in December 2023. Data collection was completed upon attaining 202 responses, initiating the data analysis phase.

3.3 Data analysis

Quantitative survey data were analyzed using Google Forms through descriptive statistics, which included frequencies and percentages. This helped in giving a concise summary of the responses by the participants. Qualitative data from open-ended survey responses were thematically analyzed to reveal recurrent themes and patterns, which provide a detailed view of students' thoughts concerning AI integration in high schools. Moreover, qualitative responses were analyzed thematically, using a coding framework to identify recurring patterns, and triangulated with quantitative data, enhancing the validity and reliability of the results.

3.4 Ethical considerations

Some ethical considerations were discussed throughout the research process. An online consent was obtained from every participant, thereby ensuring that they participated willingly and anonymously. The questionnaire never asked for any personally identifiable information to ensure the respondents' privacy and confidentiality. Ethical standards were also observed when dealing with the gathered information responsibly and respectfully. The questionnaire was a component of the institution's endeavor to create a whole-school policy.

3.5 Limitations

The research acknowledges some limitations. Firstly, the research provided was done at a high school in Kuwait and may hinder the use of findings generalized across other students or learning environments. Secondly, the use of a survey that is dependent on self-reports may pose a possible response bias. Thirdly, the cross-sectional study has only a point-in-time snapshot of students' attitudes and lacks longitudinal changes and trends. Regardless of these limitations, the study has significant findings on high school students' experiences with AI tools in the context

of educational environments and is a launching point for subsequent research in the field that is continuing to grow.

4 FINDINGS

The following section summarizes the results of the survey conducted to explore the impact of AI in education from the perspectives of students:

1. Have you used any AI-driven tools as part of your schooling?

The survey replies shed light on a varied range of experiences. Notably, 103 participants acknowledged using AI tools was favorable in their learning experience. On the other hand, 70 participants reported that they did not use such tools. The results thus suggest varied exposure to AI technologies in the learning experience of the high school participants interviewed (see Figure 1).

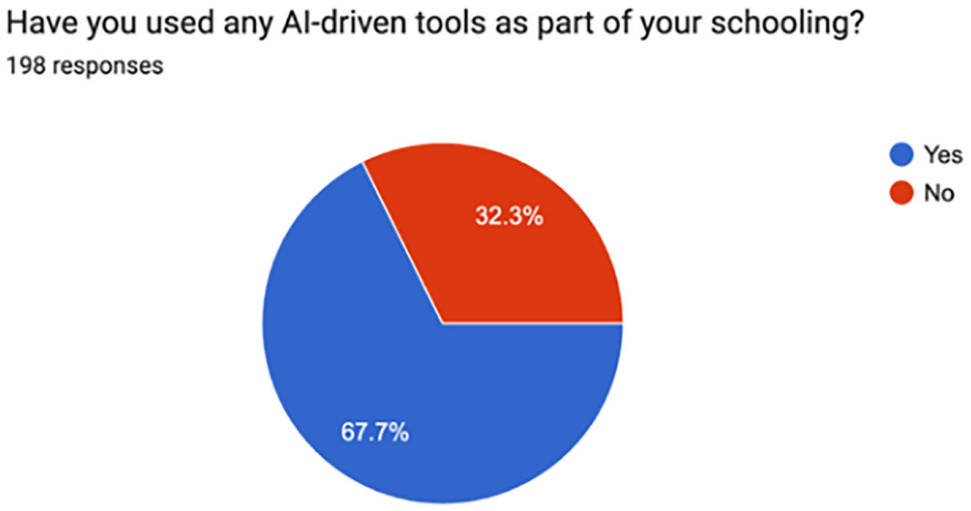

Fig. 1. Usage of AI-driven tools in schooling

2. Mention any AI tools/apps you used to aid you in your studies.

Respondents to the survey presented varied answers regarding using AI applications to facilitate their academic activities. Some students reported that they use ChatGPT as a resource in academic work. Several respondents also mentioned using other AI writing programs such as Grammarly, QuillBot, and Wordtune, which improve spelling, grammar, and text quality. A few students also reported using Photomath to facilitate mathematically-related tasks. However, some noted that they did not use any programs for their academic work and preferred the traditional approach to avoid plagiarism.

Similarly, Črček and Patekar [23] found that students at a university have a level of awareness regarding the advantages and disadvantages linked to different study aids, which has prompted a demand for outlined guidelines. The findings highlight the dual roles of study tools and the need for consistent policies to guide their use. Moreover, the favorable correlation between educators' belief in the effectiveness of AI grading and students valuing timely feedback highlighted by Roberts et al. [24] aligns with tendencies seen among high school students in Kuwait. It thus highlights the global importance of integrating AI technologies likesuch as ChatGPT in education.

Table 1. AI tools and apps used for academic support

AI Tool/ App	ChatGPT	QuillBot	Grammarly	Photomath	Matway	Wordtune	Midjourney
Number of Mentions	78	6	7	2	2	1	1

3. On a scale of 1 to 5, how beneficial are AI tools in aiding your studies?

Most students reported a favorable orientation to AI tools, with many rating them 4 or 5, meaning they registered a high benefit level. Some people rated them 3, meaning that they rated them as being moderately useful. Fewer people rated lower, i.e., 1 or 2, meaning they rated these tools as providing low benefit or being poorly applicable to their academic activity. Overall, the responses were optimistic about the usefulness of AI tools to facilitate their learning, though a minority of students were less favorable to these resources (see Figure 2).

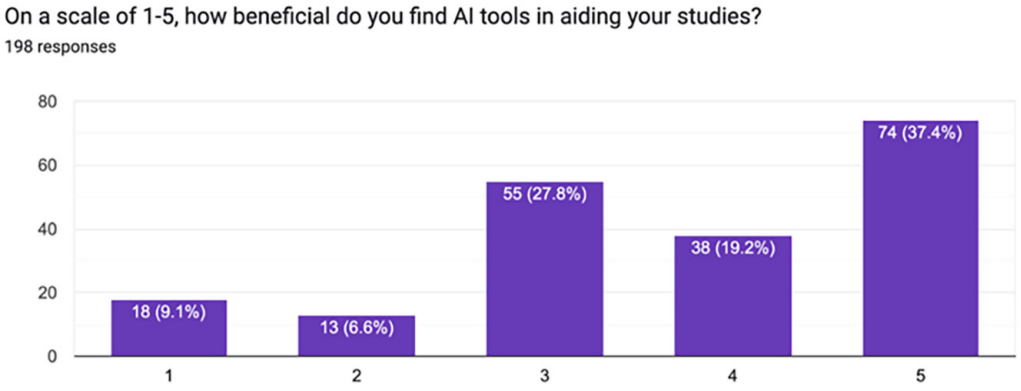

Fig. 2. Perceived benefit of AI tools in academic studies

4. Please list any specific benefits you have experienced using AI tools.

A few participants indicated that AI resources aided them in organizing their thoughts, generating ideas for projects, or composing artwork for proposals. The information was easier for them to find and comprehend and adaptable to their unique requirements. Several students have reported that the tools allow them to handle written tasks better, understand higher-order concepts, and enhance their writing skills and vocabulary. Additionally, the tools have offered higher productivity, insightful feedback, and innovative solutions. Also, other students who have incorporated AI tools have gained from grammar correction, solutions to mathematical equations, and study material preparation. Nonetheless, some students indicated they never engaged with the AI tools and, in effect, expressed concerns about their use since they are vulnerable to plagiarism problems.

5. On a scale of 1 to 5, how challenging do you find using AI tools for your studies?

Students presented varied answers about using AI tools in their scholarly activities, rated on scales ranging from 1 to 5. Some students found using AI tools quite simple and gave low effort ratings of 1 or 2. Other students found the experience somewhat more demanding and provided effort ratings of 3. Some students rated the experience as significantly difficult and provided effort ratings of 4 or 5. The high ratings suggest that some students encountered significant barriers. Overall, the gathered responses demonstrate a range of experiences incorporating AI tools into their scholarly activities, with a significant proportion viewing it as quite within their reach (see Figure 3).

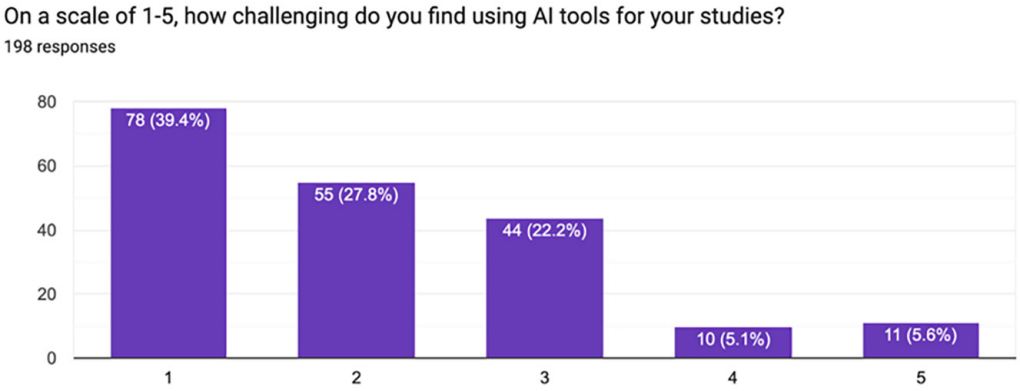

Fig. 3. Perceived challenge of using AI tools for academic studies

6. Please list any specific challenges or drawbacks you have faced using AI tools.

Students reported some drawbacks or problems with using AI tools while researching. Some reported similar obstacles, such as seeing false or incorrect information, being unable to find a reliable resource, occasional inaccuracy, and trouble obtaining the desired answer. Other students reported problems with AI comprehending their questions or providing a correct answer. They also reported technical issues, such as lag and restrictions on starting a resource, as obstacles. However, some other students did not have many problems and found using tools helpful and straightforward in research.

7. Do you find AI tools more effective, less effective, or similarly practical than traditional learning methods?

Students expressed some perspectives regarding the comparative efficacy of AI tools in relation to conventional learning strategies. Some students regarded AI tools as superior, highlighting advantages that included improved accessibility to information, increased productivity, and expedited problem-solving. They valued AI tools for their ability to clarify intricate subjects.

Conversely, a minority of students were less persuaded by AI tools. They detailed reservations about the quality of information displayed and the probability that AI would deliver false or biased responses. Furthermore, some students reported that AI tools often could not comprehend their questions holistically or give them the precise responses they desired (see Figure 4).

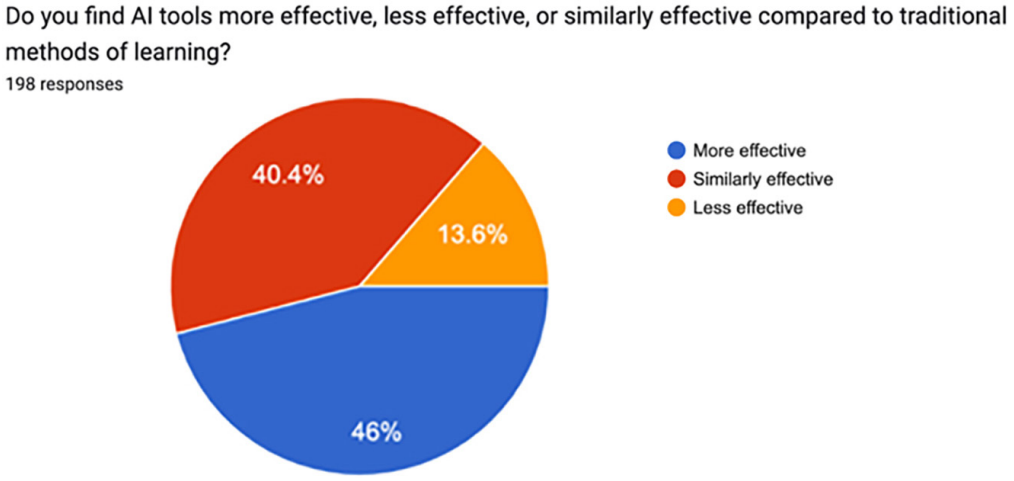

Fig. 4. Effectiveness of AI tools compared to traditional learning methods

8. What features or improvements would you like to see in AI-driven educational tools?

Students suggested improvements and features they would like to see in AI learning tools. Some of the key areas that students pointed out were:

1. Tools to assure the information's correctness and reliability since accuracy is a critical requirement for learning and research.
2. Tools should adjust to a user's level of understanding—especially for beginners.
3. Tools to help them understand concepts, rather than just provide answers, to appreciate the material on a deeper level.
4. Tools help them understand their questions better and give answers closer to the human meaning of a query.

9. Considering the AI tools you use for your studies (e.g., ChatGPT, Grammarly, and Photomath), what are the specific ways you access them (e.g., via smartphone, tablet, laptop, and desktop)? Please describe any advantages or benefits of using these AI tools for your academic work, specifically on a mobile device.

The study results confirm that students primarily utilize AI learning programs, for instance, ChatGPT, Grammarly, and Photomath, on laptops and smartphones, with a preference for mobile devices. Availability on mobile platforms is oftentimes associated with greater timeliness and flexibility, and students are thus better able to access instant responses and utilize academic resources outside formal learning settings. Some participants highlighted the advantage of mobile learning and stated that it makes tasks more efficient and facilitates research activity. Still, some participants accepted that extreme dependence on those tools would result in a loss of real participation in the learning activity, which would be a probability for misuse.

10. When using AI tools for your studies on a mobile device, what challenges or drawbacks have you specifically encountered? Please provide examples.

Students identified various restrictions on the use of AI tools on mobile devices. The most significant obstacles were linked to the small size of the screens, which hindered the ability to analyze rich materials thoroughly, and the limited functionality of mobile platforms, illustrated by difficulties copying and inserting text into submissions. The barriers often resulted in greater effort and ineffectiveness. Moreover, participants noticed that the resultant outputs from such tools were sometimes inaccurate or lacking in detail and thus reduced their usefulness in addressing advanced or specialist academic disciplines.

11. If AI-driven educational tools were specifically designed or optimized for mobile devices in your school, what new features or improvements would you suggest to make your learning experience better?

Participants called for a higher level of customization and a smoother integration of AI tools within the larger educational paradigm. Recommendations included customization of content delivery according to specific learning aptitudes, such as providing visual learners with exposure to teaching videos, and the need for greater application coordination to allow for application multitasking. Participants also emphasized the importance of intuitive interfaces that would eliminate obstacles in day-to-day use. Alongside technical considerations, some students proposed a formal use of AI tools in academic projects and tasks to make their use commonplace in pedagogical practice.

5 ANSWERING RESEARCH QUESTIONS

As stated previously, the overarching question of this study focused on how high school students engage with and perceive the integration of AI tools in their

education. The study's findings shed light on myriad aspects of students' use of AI tools within the school context, particularly concerning the five sub-questions below.

1. *How do students compare the effectiveness of AI tools to traditional learning methods?*

Students showed diverse views on the performance of the AI tool compared to traditional techniques. Particularly, a group within the student population mentioned AI tools as better than others for tasks that include information gathering, thinking, and general productivity. On the other hand, another group rated these tools less efficiently, mainly for concerns about precision and how far AI understood their questions. Still, the majority view among students is that AI tools hold a similar range of efficiency as traditional techniques and can improve various areas in education.

2. *What is the impact of the introduction of AI tools on students' academic performance and outcomes?*

Many students assert that AI tools have positively impacted their educational performance. The students acknowledged the advantages related to the use of AI tools for tasks such as information gathering, generating ideas, and aiding in studies, which leads to better educational performance. There were, however, conflicting views, as some students mentioned that AI did not impact their performance, while a small population mentioned negative impacts without explaining distinct reasons.

3. *What challenges or drawbacks do students experience when using AI tools for their studies?*

Students claimed various issues and disadvantages, such as the experience of seeing incorrect or misleading information, difficulties with finding relevant sources, occasional errors, trouble with the AI understanding their questions, concerns with plagiarism, and the potential for abuse of AI tools. Technical issues also emerged as barriers in the form of latency and accessibility restrictions. Despite that, some students found AI tools friendly and beneficial for educational purposes.

4. *What recommendations or suggestions do students propose for optimizing AI tool integration in their education?*

Students offered various suggestions, highlighting the significance of precision, flexibility, current information, and mentorship as opposed to supplying solutions. They recommended improved accessibility to AI tools, increased acceptance of their implementation within educational settings, and the incorporation of safe AI practices in schools. Some preferred characteristics identified encompass personalization, support for creativity, and the ability to circumvent AI detectors for applications. These findings have insights into the interactions of high school students with AI tools, their perceptions of the associated benefits, and recommendations for practical integration into educational frameworks.

5. *How do high school students' perceived advantages, encountered challenges, and proposed improvements for AI tools on mobile devices inform the effective design?*

The experiences of high school students underscore that, although mobile access to AI tools provides considerable benefits such as convenience, flexibility, and responses for learning on the move and expediting tasks, it also poses specific challenges, including limitations due to small screen sizes, restricted functionality for specific tasks such as copying and pasting, and sporadic inaccuracies or a lack of depth in the responses. To guide the development of effective and pedagogically valuable mobile-based learning solutions, students suggest enhancements such as increased personalization, seamless integration within the educational framework, improved application synchronization, and more user-friendly interfaces, thereby highlighting the necessity for future designs to emphasize accuracy, personalization, and integration to augment the educational efficacy of these tools.

6 DISCUSSION

This study aims to offer significant insights into the influence of ChatGPT and other AI tools on educational experiences within high schools in Kuwait. By exploring the perspectives of 150 students, the findings explain the multifaceted role of AI in education, including its benefits, challenges, and effectiveness compared to traditional methods. These insights contribute to the ongoing discussion on the transformative potential of AI in education, emphasizing its capacity to shape innovative learning experiences and prepare students for the evolving demands of the 21st-century workforce.

The most frequently mentioned AI tool was ChatGPT, suggesting it is better known and the most frequently used among the student body. Other tools, such as Grammarly, QuillBot, and an array of AI-based paraphrasing apps, were also mentioned. The most frequently mentioned AI tool was ChatGPT, suggesting it's more familiar and the most frequently used among the students. Other tools, such as Grammarly, QuillBot, and a range of AI-based paraphrasing apps, were also mentioned.

This refers to a greater tendency to use AI if language-related tasks are at stake, e.g., writing assistance and paraphrasing. Second, some of the respondents claimed to use AI tools for research tasks to give ideas for English speeches and research topics and to cite references. This means that AI tools are regarded as useful for research and idea-generation tasks. Some of the responses recognized AI tools such as ChatGPT but claimed not to use them. This means that while some students know the tools, they may regard them as irrelevant or unnecessary for academic purposes.

Some respondents mentioned not using AI tools due to concerns about plagiarism. This highlights ethical consideration and awareness about the proper use of AI tools in an academic setting. Finally, many respondents mentioned that they do not use AI tools in their studies. This could be because of different reasons, such as a lack of awareness, a preference for traditional study methods, or concerns about AI tools' effectiveness and ethical implications. The findings align with existing studies highlighting the productivity benefits of AI tools, such as ChatGPT [25], while diverging in students' heightened concerns about ethical issues and dependency. This underscores the need for a region-specific approach to addressing these challenges within the MENA context.

The findings indicate that mobile access to AI tools offers notable advantages, particularly in convenience, accessibility, and efficiency. At the same time, challenges relating to usability, reliability, and screen-based constraints limit their effectiveness for more complex tasks. Students' recommendations suggest a desire for AI systems that function smoothly on mobile platforms, adapt to diverse learning preferences, and integrate with institutional practices. These insights point to the need for future design improvements that prioritize accuracy, personalization, and integration, thereby enhancing the pedagogical value of mobile-based AI learning tools.

Looking forward to furthering the findings of this study, some ideas for future research are found. Firstly, it would be helpful to use longitudinal studies to weigh AI's long-term impacts on students' academic performance and preparedness for entering their careers. Secondly, it will also be relevant to include AI ethical considerations in education concerning issues such as plagiarism, privacy, or even the ethical use of AI materials. Thirdly, the impact of the usage of AI tools on educational outcomes concerning different subjects and academic grades should be

examined. Fourthly, there is a suggestion to conduct comparative analyses regarding the various AI programs and systems to improve educational experiences.

7 CONCLUSION

This study examined high school students' experiences and attitudes towards the value, obstacles, and effects of AI tools on students' learning experience. It gained insight into their recommendations and attitudes regarding the prospective use of AI in learning. Students value AI's help in organizing work, explaining concepts, and enhancing writing skills, while being skeptical regarding information correctness and understanding of questions asked by AI. There are mixed opinions regarding AI being more efficient than conventional learning techniques. Some are more effective for matched tasks, yet unanimous on AI supplementing conventional techniques rather than offsetting them. Most students credit AI tools for better academic performance and preparedness for the future, while some have seen diminished impacts.

Key challenges include the accuracy of information, the credibility of sources, technical difficulties, and concerns about plagiarism, which need to be further improved and responsibly used to use AI tools. Students' suggestions for optimization are based on accuracy, flexibility, access, and using AI for ethical purposes. These recommendations are valuable for educational institutions and developers to enhance the integration of AI with the optimization of learning experiences. Overall, the findings highlight the importance for educators and policymakers to develop structured guidelines and training programs to maximize AI tools' practical and ethical integration in K-12 education.

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