The Extent of Use of Artificial Intelligence in Education by High School Teachers

مدى استخدام الذكاء الاصطناعي في التعليم من قبل معلمي المدارس الثانوية

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Abstract

This study investigated the extent of use of artificial intelligence in education by high school teachers. It aimed to examine if teachers are familiar with AI, its uses, and its tools, and if they integrate it in their teaching practices, and in what ways. This study used a quantitative research design where data was collected through a validated questionnaire from high school teachers from several high schools in Beirut. The data was analyzed by using descriptive statistics and then interpreted to reveal that high school teachers in Beirut are familiar with AI and its uses, and their use of it in their teaching practices and classrooms is moderate, in both didactic, and formative and strategic use, with main focus being specifically on assistive usage such as lesson preparation and content creation, and a lower usage in tasks related to assessment of students. This study concluded that although the usage of AI by high school teachers is moderate, there is still room for a more efficient integration through a more institutionally organized integration that offers teachers the suitable support and plan to follow for the benefit of both teachers and students.

Keywords: artificial intelligence, AI in education, high school teachers, teaching practices

الملخّص

هدفت هذه الدّراسة الى دراسة مدى استخدام الذّكاء الاصطناعي في التعليم من معلمي المرحلة الثانوية، بهدف تحديد مدى إلمامهم بالذّكاء الاصطناعي واستخداماته وأدواتـه، وما إذا كانوا يدمجونه في ممارساتهم التّدريسيّة، وكيف. اعتمدت الدّراسة

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منهجًا بحثيًا كميًا، إذ جُمعت البيانات من خلال استبيان مُدقَّق من عينة من معلمي المرحلة الثانوية في عدد من المدارس الثانوية في بيروت. حُلِّلت البيانات باستخدام الإحصاء الوصفي، ثم فُسِّرت لتُظهر أن معلمي المرحلة الثانوية في بيروت على دراية بالذكاء الاصطناعي واستخداماته، وأن استخدامهم له في ممارساتهم التّدريسيّة وفصولهم الدّراسيّة متوسط، سواء في الاستخدام التّعليمي أو التكويني والاستراتيجي، مع التركيز بشكل أساسي على الاستخدام المساعد، مثل إعداد الدّروس وإنشاء المحتوى، واستخدام أقل في المهام المتعلقة بتقييم الطلاب. خلصت الدّراسة إلى أنّه على الرّغم من أن استخدام معلمي المرحلة الثانوية للذكاء الاصطناعي متوسط، إلّا أنّ هناك مجالًا لدمجه بشكل أكثر فعاليّة من خلال دمج مؤسسي أكثر تنظيمًا يوفر للمعلمين الدّعم المناسب وخطة عمل مُلائمة، بما يعود بالنَّفع على كل من المعلمين والطلاب.

الكلمات المفتاحيّة: الذَّكاء الاصطناعي، الذكاء الاصطناعي في التعليم، معلمو المرحلة الثانوية، أساليب التدريس.

Introduction

Artificial intelligence is causing rapid and impactful changes worldwide, especially in educational practices, providing various tools in relation to teaching such as personalized teaching, automated feedback, and administrative support (Garzón et al., 2025). Research shows that there is an increase in educators' interest in using AI, and also reflects on the obstacles that teachers might face, from unpreparedness and lack of support to ethical concerns, making the adoption of AI in education possibly ineffective (Perse, 2025; Zawacki-Richter et al., 2019). In Lebanon, the spread of AI tools left an influence on education that continues to develop. Certain studies that were conducted with university students prove high levels of AI familiarity among students which suggests that there's an acceptance of usage of AI in educational settings but with room for development in terms of way and extent of use (Kharroubi et al., 2025). Nevertheless, there has been limited research focusing on usage of AI by school teachers, leaving a gap that needs to be covered.

Research Problem

Despite the widespread of usage of AI in education, not all high school teachers chose to adopt this new innovation into their teaching, and those who did adopt it use it in various ways that are not organized monogamously among all teachers

(Xue et al., 2025). Although there's been extensive research about usage of AI in education, there isn't enough data that help in giving us a clear input about high school teachers' use of AI in education (Tripathi et al., 2025).

Thus, it is very important that we get an overview of the extent to which high school teachers are using AI in their teaching practices, and in what areas it's mostly used.

Purpose Statement

The purpose of this quantitative study is to explore if high school teachers of all subjects in private and public schools in Beirut use AI in education, thus, giving us insight on whether AI is widely accepted among high school teachers or not, and to what extent they engage with it when it comes to different aspects of teaching.

This research has three main questions:

1. Are high school teachers in Beirut familiar with AI and its uses in education?
2. Do high school teachers in Beirut use AI in education?
3. How do high school teachers in Beirut use AI in education?

Significance of the Study

This study is significant because identifying the extent of teachers' AI usage gives us practical insights into how AI is currently involved in the teaching process in high school education in Lebanon. Additionally, understanding how high school teachers engage with AI gives a clearer vision to how policymakers should become involved to make sure that AI tools is in agreement with pedagogical goals and classroom needs in Lebanese high schools.

Literature Review

AI has been globally on the rise these past few years, causing a shift in technology and leaving an impactful change on various sectors, especially education (Kamalov et al., 2025). Of the most notable innovations that AI introduced to education, it's important to highlight automated administrative tasks, personalized learning, and AI-driven analytics (Oruganti, 2024). Upon its integration, AI has proven to have its benefits in education (Rani & Sharma, 2026). For example, personalized learning shows promising improvement in students' performance and their engagement in class (S & Korath, 2024).

However, despite the proven benefits of AI, many teachers are still hesitant when it comes to integrating it into their teaching (Ghiasvand et al., 2026) and that circles back to unfamiliarity and possible challenges,

such as insufficient resources, lack of knowledge, and technical issues, that come with integrating a new innovation into their teaching ways that they're accustomed to (Tsai, 2025; Mehdaoui, 2024). Many teachers also hold back on using AI due to ethical concerns such as academic integrity, data privacy, and algorithmic bias (Nofirman et al., 2025).

Taheri et. al (2025) used a grounded meta-analysis approach to analyze findings from recent research on AI adoption in education by teachers. The results showed that teachers' acceptance of AI and its adoption depended heavily on their personal experiences and opinions, including ethical concerns, as well as their environment's circumstances such as technological readiness. Teachers with more awareness and experience with AI were more accepting of the use of AI in education than those who lacked the appropriate knowledge about AI (Taheri et al., 2025).

It was also shown that the appropriate training, support and technological readiness made teachers more comfortable with the idea of adopting AI in education (Taheri et al., 2025). Similarly, Holmes et al. (2022) highlighted the importance of institutional support and training for the journey of teacher's acceptance and adoption of AI (Holmes & Tuomi, 2022).

Ethical issues have also been some of the teachers' most notable concerns that affect their acceptance of using AI in education especially when it comes to dependency on AI, data privacy, and algorithmic bias (Taheri et al., 2025). A study by Metin and Çetin (2026) also confirms ethical concerns of teachers about AI in education, such as data privacy, algorithmic bias, unequal access, and fairness in AI-supported decision-making which hinders their acceptance of using AI in their classrooms (Metin & Çetin, 2026).

Methodology

Research Methodology

This study used a quantitative descriptive design to study and analyze the extent of use of AI in education by high school teachers.

A questionnaire was used to measure the extent of use of AI by high school teachers in Beirut which helped in examining that use and its ways within our chosen population and enabled us to collect quantifiable data that makes statistical analysis and interpretation much more accessible.

Population and Sampling

The target population consisted of high school teachers in Beirut who

are currently working, regardless of which subject they teach. Convenience sampling was used to select participants where the questionnaire was sent to 15 different high schools in Beirut where 64 teachers participated in this study.

Instrument of the Study

This study's main instrument is a questionnaire adapted from a validated and reliable questionnaire that is used to measure the use of AI in education by math teachers (Ramirez et al., 2026). Only the questions related to all subjects, and not specific to the subject of mathematics, were used to fit the purpose of our study. Two questions were added to determine if the teachers use AI or not at all and if they're familiar with it.

The survey was made using google forms and sent to the participants through online platforms. Participants rated their responses using a five point Likert scale, from 1 to 5. The questionnaire also included questions about background information such as teaching experience, subject taught, and degree of exposure to AI tools. The questions about the way of use of AI, which are 11 out of 13 questions, were classified into didactic use, and strategic and formative use as per the study in which the questionnaire was adapted from (Ramirez et al., 2026).

Table 1

Questions used from (Ramirez et al., 2026) in questionnaire and their classification in accordance with use of AI in education by high school teachers.

No.	Statement	Classification
1	I am familiar with AI and its uses in teaching.	AI Familiarity and General Use
2	I use AI tools in my teaching practices.	AI Familiarity and General Use
3	I use text, image, and voice search engines that work with AI technology.	Didactic Use
4	I use AI applications to design interactive activities, such as games or simulations.	Didactic Use
5	I incorporate AI applications to support the presentation of educational materials in my classes.	Didactic Use
6	I provide feedback to students using AI applications.	Didactic Use
7	I generate questions according to student levels using Chat GPT, Khan Academy, or other resources.	Didactic Use
8	I prepare educational activities using AI technology that takes into account individual differences between students.	Didactic Use
9	I use AI-based translation apps such as Google Translate.	Didactic Use
10	I use personal assistants on my cell phone to search for information, such as Google Assistant and Siri.	Didactic Use

11	I encourage interaction between me and the students, and the students themselves using collaborative learning frameworks suitable for AI applications.	Strategic and Formative Use
12	I analyze exam results using AI.	Strategic and Formative Use
13	I use AI applications to choose the best type of evaluation.	Strategic and Formative Use

Note. Adapted from "Validation of a Questionnaire Assessing Artificial Intelligence Use in Secondary Mathematics Education in Peru," by E. T. Susanibar Ramirez, A. Tapia Díaz, R. R. Torres Gallegos, E. C. Andrade Girón, E. Tocto-Cano, and J. L. López-Gonzales, 2025, Frontiers in Education, 10, Article 1680330 (https://doi.org/10.3389/feduc.2025.1680330).

Validity and Reliability

Due to the removal of some questions and the addition of two, the questionnaire was shown to experts in the field to make sure that that removal and addition don't affect the reliability and validity of it, nor affect the relevance of results it gives in relation to the purpose of our study. Furthermore, a pilot study was conducted with a group of 10 high school teachers of various subjects. They were asked to view and fill in the questionnaire, and give any feedback regarding the clarity of the questions and purpose of the questionnaire. It was reported that all participants found the questionnaire to be clear and straightforward, with the questions being in line with the study as it was explained to them. The participants of the pilot group were later not included in the study.

Ethical Concerns

The participation in this study was voluntary. All participants were made aware of that before filling in the questionnaire. Teachers were assured that all the information gathered would be anonymous and confidential. The high school teachers were also made aware that they have the right to withdraw from the study at any time they want without any consequences. The data that was gathered was used strictly for research purposes and was only accessible for the researcher.

Data Analysis and Results

The descriptive interpretation of the mean scores was conducted according to table 2 adopted from a previous study (Pimentel, 2019).

Table 2

Five Point Lickert Scale Description

Lickert Scale	Interval	Difference	Description
1	1.00-1.79	0.79	Never
2	1.80-2.59	0.79	Rare
3	2.60-3.39	0.79	Sometimes
4	3.40-4.19	0.79	Often
5	4.20-5.00	0.80	Always

Note. Reprinted from "Some Biases in Likert Scaling Usage and its Correction," by J. L. Pimentel, 2019, *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 45(1), pp. 183–191 (https://www.gssrr.org/JournalOfBasicAndApplied/article/view/9874). Copyright 2019 by Jonald L. Pimentel.

Table 3

Descriptive Statistics of Statements Concerning AI Familiarity and General Use

AI Familiarity and General Use			
Statement No.	**Mean**	**Std. Deviation**	**Degree**
1	3.66	0.946	Agree
2	3.36	1.118	Neutral
Overall Mean Score	3.51	1.041	Agree

The first statement had a mean score of 3.66 (SD = 0.946), interpreted as Agree, which means that most participants believed they were familiar with AI and its uses in teaching. The second statement had a mean score of 3.36 (SD = 1.118), interpreted as Neutral, which means that participants sometimes used AI tools in their teaching practices. The overall composite mean score was 3.51 (with a SD of 1.041), interpreted as Agree. This means that most participants consider themselves familiar with AI, its tools, and its uses in education.

Table 4

Descriptive Statistics of Statements Concerning Didactic Use of AI

Didactic Use			
Statement No.	**Mean**	**Std. Deviation**	**Degree**
3	3.36	1.160	Neutral
4	3.05	1.290	Neutral
5	3.30	1.164	Neutral
6	2.59	1.255	Disagree

7	3.05	1.362	Neutral
8	3.08	1.238	Neutral
9	3.50	1.234	Agree
10	3.11	1.347	Neutral
Overall Mean Score	3.132	1.256	Neutral

The third statement had a mean score of 3.36 (SD = 1.160), interpreted as Neutral. This suggests that respondents sometimes use such AI powered engines.

The fourth statement had a mean score of 3.05 (SD = 1.290), interpreted as Neutral. This suggests that respondents sometimes use AI applications for the designing of activities. The fifth statement had a mean score of 3.30 (SD = 1.164), interpreted as Neutral. This suggests that respondents sometimes use AI applications for presentations. The sixth statement had a mean score of 2.59 (SD = 1.255), interpreted as Neutral. This suggests that respondents rarely use AI to provide feedback to students. The seventh statement had a mean score of 3.05 (SD = 1.362), interpreted as Neutral. This suggests that respondents sometimes use AI tools for creation of questions.

The eighth statement had a mean score of 3.08 (SD = 1.238), interpreted as Neutral. This suggests that respondents sometimes prepare personalized educational activities using AI technology.

The ninth statement had a mean score of 3.50 (SD = 1.235), interpreted as Agree. This suggests that respondents often use AI powered translation apps.

The tenth statement had a mean score of 3.11 (SD = 1.347), interpreted as Neutral. This suggests that respondents sometimes use AI powered personal assistants.

The overall composite mean score was 3.132 with a standard deviation of 1.256, corresponding to the degree of Neutral. This indicates that respondents generally sometimes employ AI for didactic use in education.

Table 5

Descriptive Statistics of Statements Concerning Strategic and Formative Use of AI

Strategic and Formative Use			
Statement No.	**Mean**	**Std. Deviation**	**Degree**
11	3.06	1.153	Neutral
12	2.20	1.287	Disagree
13	2.67	1.369	Neutral
Overall Mean Score	2.64	1.269	Neutral

The eleventh statement had a mean score of 3.06 (SD = 1.153), interpreted as Neutral. This suggests that respondents sometimes encourage students' involvement with AI applications.

The twelfth statement had a mean score of 2.20 (SD = 1.287), interpreted as Neutral. This suggests that respondents rarely analyze exam results using AI.

The thirteenth statement had a mean score of 2.67 (SD = 1.369), interpreted as Neutral. This suggests that respondents sometimes use AI to choose the best type of evaluation. The overall composite mean score was 2.64 with a standard deviation of 1.269, corresponding to the degree of Neutral. This indicates that respondents generally sometimes employ AI for strategic and formative use.

Discussion

The findings derived from the descriptive statistics show that the high school teachers in Beirut are mostly familiar with AI and its uses, and usually use AI in their teaching practices. It is also shown that high school teachers sometimes use AI for didactic use, and strategic and formative use in education, where didactic use of AI is more prevalent.

According to the results, teachers mostly employ AI for tasks including lesson preparation and content creation, and using it least for task related to evaluation of students. The overall usage is considered moderate where teachers are becoming increasingly familiar with AI technologies, particularly generative AI tools. However, the findings also suggest that AI integration remains limited to basic instructional support rather than advanced pedagogical applications.

These results align with previous research showing that teachers usually use AI mainly for pedagogical support and preparation. In "The Promises and Challenges of Artificial Intelligence for Teachers" (Celik et al., 2022), it was found that teachers mainly turned to AI for lesson planning, feedback, and identifying student needs. The findings also align with a previously mentioned research which showed that teachers' use of AI was mainly pedagogical and administrative, particularly for content generation, lesson preparation, and classroom support (Tripathi et al., 2025). This suggests that teachers generally perceive AI as a helping tool that supports their work and enhances it rather than replace it.

The findings also indicated that teachers used AI applications such as translation tools, search engines, and virtual assistants at a moderate level.

Such findings are supported by "The Utilization of Artificial Intelligence (AI) in Lesson Planning by Millennial Teachers" (Vitanova et al., 2025), which emphasized that teachers use AI mainly to improve efficiency, organize lessons, and simplify instructional tasks.

Similarly to how our study found lower use of AI for assessment analysis and evaluation, "The Promises and Challenges of Artificial Intelligence for Teachers" (Celik et al., 2022), highlighted that teachers remain cautious about AI implementation due to concerns related to reliability, ethics, and lack of training.

The moderate level of AI use may be due to the lack of formal training programs related to AI in education. Many teachers are still exploring AI independently without professional guidance or school involvement. In addition, concerns related to ethical use, academic integrity, student dependency on AI, and data privacy may also limit teachers' willingness to integrate AI extensively into educational practice as mentioned previously (Metin & Çetin, 2026).

The findings show that high teachers already demonstrate moderate use and awareness of AI applications. Schools and educational authorities should provide structured training programs that help make possible effective and ethical integration of AI into teaching and assessment practices. Professional development initiatives may help teachers move beyond basic AI applications toward a more advanced use of AI that benefits both the students and the teachers, and makes the learning experience and teaching process more efficient and smooth.

Limitations of the Study

First, the study included only high school teachers in Beirut, and that might affect the generalizability of the results in other contexts. The data collection in this study also relied on self-reported responses, that can be affected by personal bias or inaccuracy in the answers given. In addition, the study did not cover a longitudinal follow-up, meaning it couldn't cover the ever-changing attitudes of high school teachers towards AI and how they're using it and their evolving knowledge and skills of AI and its tools. Last, the number of participants from some high schools was limited, which may reduce the representativeness of individual high school contexts.

Recommendations:

Based on the study's findings, schools should provide training

programs that help and guide teachers towards a more efficient and fruitful employment of AI in their teaching practices. Schools should also be more involved in the integration of AI by teachers to ensure the establishment and following of ethical guidelines that protect both the students and the teachers. Also, there should be continuous studies conducted on the use of AI by teachers to show how that use changes as AI progresses and as AI becomes more employed and accepted by people, especially teachers.

Conclusion

This study showed that majority of high school teachers are familiar with AI, its tools and uses, and generally are using it in education. The extent of use for both didactic, and strategic and formative use by high school teachers seemed moderate, which is in line with the local context since AI has still not been officially integrated in schools. Any use of AI by teachers comes from personal effort, without any professional training and proper plans of integration by policymakers. The teachers seemed to be using AI as an assistant, focusing on tasks related to lesson preparation, content creation, educational activities, information searching, etc. The teachers seemed hesitant to use AI for any form of assessment or grading of students, probably relating to lack of trust when it comes to fairly assessing students and their work. The findings show a promising future for employment of AI in education by high school teachers, and show that teachers would be ready and willing to fulfill their role in official integration by schools with more efficient planning and with proper guidance to both teachers and students.

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