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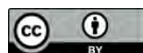
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Author for correspondence:

Yasemin Cetin

 yasemincetinn4@gmail.com

 Kutahya Dumlupınar University, Türkiye



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Examining School Principals' and Teachers' Perceptions of Using ChatGPT in Education

Yasemin Cetin , Özgür Taş , Halil Alakuş , Halil İbrahim Kaplan 

Abstract

Background/purpose. ChatGPT has become one of the groundbreaking examples of artificial intelligence-based chatbots with its capacity to produce texts and engage in human-like conversations. Therefore, it has garnered the attention of people with diverse backgrounds, including educational professionals. The current study aims to investigate how school principals and teachers perceived the use of ChatGPT in education and reveal their attitudes towards using AI-based tools to facilitate the teaching-learning experience.

Materials/methods. The study was designed using the qualitative case study method since it aimed to gather detailed information regarding school principals' and teachers' perceptions of ChatGPT. Data was collected from 80 teachers and school principals selected purposefully from public primary, secondary, and high schools. Data was analyzed using content analysis techniques by synthesizing codes into categories and themes.

Results. The study revealed four major themes regarding school principals' and teachers' perceptions of ChatGPT: overall perceptions, perceived opportunities, perceived risks, and the effective use of ChatGPT. The participants referred to several advantages of using ChatGPT in education such as lesson planning, offering customized learning, and enabling easy and fast access to information. They were also cautious about some risks such as ethical and responsible use, the likelihood of encouraging dishonesty, free-riding, cheating, or plagiarism as well as weakening students' cognitive skills. Due to its potential to provide inaccurate information depending on the reliability of its data source, they were also doubtful that it could provide students with false guidance in its current form. The participants also made some recommendations to make better and more effective use of ChatGPT in education such as providing ongoing training for both teachers and students on recent developments, increasing the reliability of its data sources through continuous tests, and aligning its capacity with the readiness and age of students.

Conclusion. The current study showed that school principals and teachers had sufficient knowledge of ChatGPT and mostly had a positive attitude towards its use in education despite some risks. Combined with the findings of prior studies, the current results suggest taking several steps to minimize the risks and offering both pre-and in-service training to teachers for more effective use.

1. Introduction

The history of humanity has witnessed numerous events that have brought major changes to human life. Studies on the functioning of the human brain from a variety of perspectives have added to these events significantly not only through uncovering some of the mind-blowing functions of the brain but also through providing insights into the development of artificial intelligence systems that can mimic these functions of human brain (Kazu & Özdemir, 2009; Papadakis et al., 2024).

As Bostrom and Yudkowsky (2011) and Luckin (2017) suggested, recent technological developments have affected societies by several means. Among these developments, artificial intelligence (AI) has created a revolution in people's lives. With the development of AI-based systems, a new era has begun in human life, making AI a focal point in many areas of life from internet search engines to smartphone applications, from public transportation to home appliances, from medicine to informatics, education to weather, and stock market forecasts. Indeed, AI-based systems have now begun to facilitate our lives by offering various solutions to everyday problems (Bostrom & Yudkowsky 2011; Karakose & Tülübaş, 2024; Luckin, 2017). Zeide (2019), for instance, states that voice and translator applications such as 'Siri', visual design applications involving face recognition or filters that can create extraordinary effects on Snapchat or Instagram, and TikTok videos are some of the widely used examples of AI-based technologies in daily life. Similarly, Amazon uses artificial intelligence to recommend books, Spotify to recommend songs, and schools to facilitate students' learning.

Parlak (2017) underlines that developments in the AI world are particularly intriguing considering the likely influence of these technologies on the digital transformation of schools in the current era when many people effectively benefit from these AI-based systems (Parlak, 2017). In this age of rapid technological developments, the field of education cannot be exempt from the transforming influence of these technologies since education systems are closely aligned with the other systems in society (Abbas & Gasmi, 2024; Akgün, 2023; Karakose et al., 2024). Therefore, in parallel with these digital transformation processes in educational environments, significant changes in students' perspectives regarding the use of these technologies would be facilitated (Sarsıcı & Çelik, 2019).

AI technologies can offer several solutions to problems encountered by students of all levels, from primary to graduate education. ChatGPT (generative pre-trained transformer), one of the recently developed AI-based chatbots, for instance, can produce largely accurate and reliable answers to every question asked thanks to its constant training on digital content. ChatGPT is a type of chat robot based on artificial intelligence developed by OpenAI. With its ability to produce human-like conversations, ChatGPT can perceive written language, create explanatory texts in response to questions, translate texts in different languages, create new content based on rapid synthesis of digital information, and even write sophisticated texts such as academic articles. It can also produce software using various computer programming languages and debug errors down to the smallest detail (Karakose, 2024; Noever et al., 2023; Sok & Heng, 2024).

With all these functions, ChatGPT has facilitated the educational processes of both students and teachers in every respect. It has become the fastest way to access information and has reached millions of users since the day it was introduced. As suggested by Abbas and Gasmi (2024; p. 2), ChatGPT's advanced capabilities allow it to engage in meaningful dialogues, create various perspectives, and simulate complex scenarios; all of which are crucial for developing cognitive skills such as critical thinking, problem-solving, and reflective thinking.

Critical thinking, creative thinking, analytical thinking, and problem-solving skills, which are called 21st-century skills, have now become even more significant for today's education systems. These skills, which are very difficult for students to develop and teachers to teach, have been facilitated by artificial intelligence applications, especially natural language processing chatbots such as ChatGPT. Integrating ChatGPT and similar artificial intelligence tools into education encourages deep cognitive

development and offers new solutions to problems. With its ability to provide instant feedback and facilitate deep discussions, ChatGPT offers a new way to nurture these skills.

AI-based systems are now increasingly used in education to offer novel and high-quality education, facilitating teachers' ability to create better learning conditions and helping students structure their own learning (Eren, 2021, p. 188). Therefore, the knowledge and attitudes of school principals and teachers regarding AI systems such as ChatGPT can affect education management and teaching processes, positively or negatively. A review of studies conducted on the use or influence of ChatGPT between 2014 and 2024 shows that the perceptions of school principals and teachers regarding the use of ChatGPT for educational purposes have garnered weaker research interest, and thus the existing literature offers limited insights into how they perceive the integration of ChatGPT into the education field. Addressing this gap, the current study aimed to investigate school principals' and teachers' perceptions of ChatGPT as a recent example of an AI-based system, and offer some insights into how these perceptions can influence their attitude towards using these technologies in education.

2. Literature Review

The 21st century is marked by revolutionary digitalization based on AI systems, and the field of education is inevitably taking its share of these transformations. In addition to early versions of AI systems used in daily life such as Siri, Alexa, and Google AI, chatbots such as ChatGPT, Gemini, and Bing have become quite integral to people's lives including students, teachers, and school principals. Therefore, researchers have also begun to pay greater attention to understanding how these technologies are perceived and can be utilized for various purposes.

Some of these studies existing in the literature have focused on the reliability and utility of information produced by ChatGPT. For instance, Karakose et al. (2023) investigated a comparative analysis of responses produced by ChatGPT 3.5 and ChatGPT 4 regarding digital leadership in education and found that both versions were quite successful in making accurate and meaningful responses. From another perspective, Zhai (2022) asked ChatGPT to write an academic article entitled "ChatGPT User Experience: Implications for Education", and observed that ChatGPT was capable of producing informative, consistent, and systematic texts with partially accurate content while highlighting that it lacked creativity and critical thinking skills. In the same vein, Karakose (2023) investigated the possible advantages and disadvantages of using ChatGPT in educational research and suggested its use to facilitate research but with caution.

Other studies focused on the possible advantages and disadvantages of integrating ChatGPT into education. To illustrate, Aktay et al (2023) investigated fourth-level students' perceptions regarding the use of ChatGPT in education. The study revealed that students found ChatGPT interesting and entertaining, as well as having strong potential to support academic achievement through responding quickly to students' queries. Several other studies underlined that ChatGPT can enhance teaching-learning capacity with its remarkable capabilities such as providing customized learning opportunities to students with diverse needs, giving fast and targeted feedback at any time and place, and offering novel methods of assessment (Karakose & Tülübaş, 2023; Karakose, 2024; Kirtay, 2023; Memarian & Doleck, 2023; Mhlanga, 2023; Oranga, 2023; Rahman & Watanobe, 2023). Some researchers particularly focused on ChatGPT's ability to support students' creativity, critical thinking, and problem-solving skills (Abbas & Gasmi, 2024). These studies underlined that ChatGPT had great potential to support such by its capacity to engage in human-like conversations with students despite some risks posed by its current status such as data security, accuracy, or ethics. Whalen & Mouza (2023), on the other hand, pointed to the integration of AI-based systems such as ChatGPT into teacher education to increase their awareness of their possible utility or risks as well as develop their capabilities to use these systems to enhance their instruction.

A recent study by Fütterer et al. (2023), which analyzed tweets on the X platform (previously Twitter) showed that the use of ChatGPT in education was the most popular topic of discussion on the X platform. These tweets were not only focused on the potential contributions of ChatGPT but also on several risks and pitfalls.

3. Methodology

This study, which examined the perceptions of school principals and teachers regarding the use of ChatGPT in education, was designed as a qualitative case study. Case studies are often preferred when a study aims to make an in-depth investigation of a particular case in its original context by using multiple information sources (Creswell, 2013). This method was used in the current study because it aimed to determine the perceptions of school principals and teachers regarding the use of ChatGPT employing the analysis of their detailed responses.

3.1. Participants

Participants of the study were selected purposefully from school principals and teachers working at public primary, secondary, and high schools in Kütahya, Türkiye during the 2023-2024 academic year. In order to get more generalizable and reliable data, school principals and teachers were selected to represent all school levels in Kütahya province. A total of 80 school principals and teachers who volunteered to participate in the research were included in the study.

3.2. Data collection

The data for this study was collected using a semi-structured interview form. During the preparation of the form, the relevant literature was reviewed and expert opinions were obtained. Cohen and Manion (2002) defined an interview as a research technique in which a controlled and purposeful form of verbal communication occurs between the researcher and the participants. Interviews can be conducted in various ways such as face-to-face group interviews, mail, self-answered questionnaires, or telephone interviews. According to Siedman (1991, (cited in Yılmaz & Arık, 2019), the main purpose of using the interview technique is generally not to test a hypothesis; on the contrary, it is to try to understand people's experiences and how they make sense of these experiences. The interview form included an informed consent statement, a demographic information query, and interview questions. Within the scope of the research, a total of 4 questions were asked to the participants, and the data were collected through face-to-face interviews which lasted about an hour.

3.3. Data analysis

Data for the current study was analyzed using descriptive analysis techniques, particularly qualitative content analysis. During content analysis data obtained from the participants is submitted to detailed analysis to identify codes, categories, and finally the themes in light of the research questions or a predetermined conceptual framework (Yıldırım & Şimşek, 2008). By collecting similar data under certain categories and themes, the analysis offers more meaningful and easily understandable results.

During our data analysis process, four researchers worked independently and created themes. The consensus rate of the created themes was calculated based on Miles and Huberman's Reliability = $\text{Consensus} / (\text{Consensus} + \text{Disagreement}) \times 100$ formula (Miles & Huberman, 1994). As a result, an 85% consensus rate was achieved among the four researchers' results. For the themes with low consensus rates, we applied expert opinion and agreed on a final set of themes with the involvement of all researchers and the expert in an open discussion session.

4. Results

The categories and themes that emerged from the analysis of data obtained from school principals and teachers are presented under four headings: overall perception of ChatGPT, perceived opportunities of ChatGPT, perceived risks of ChatGPT, and the effective use of ChatGPT, all of which refer to the main themes revealed by the content analysis. The scheme of themes and subthemes is presented in Figure 1.

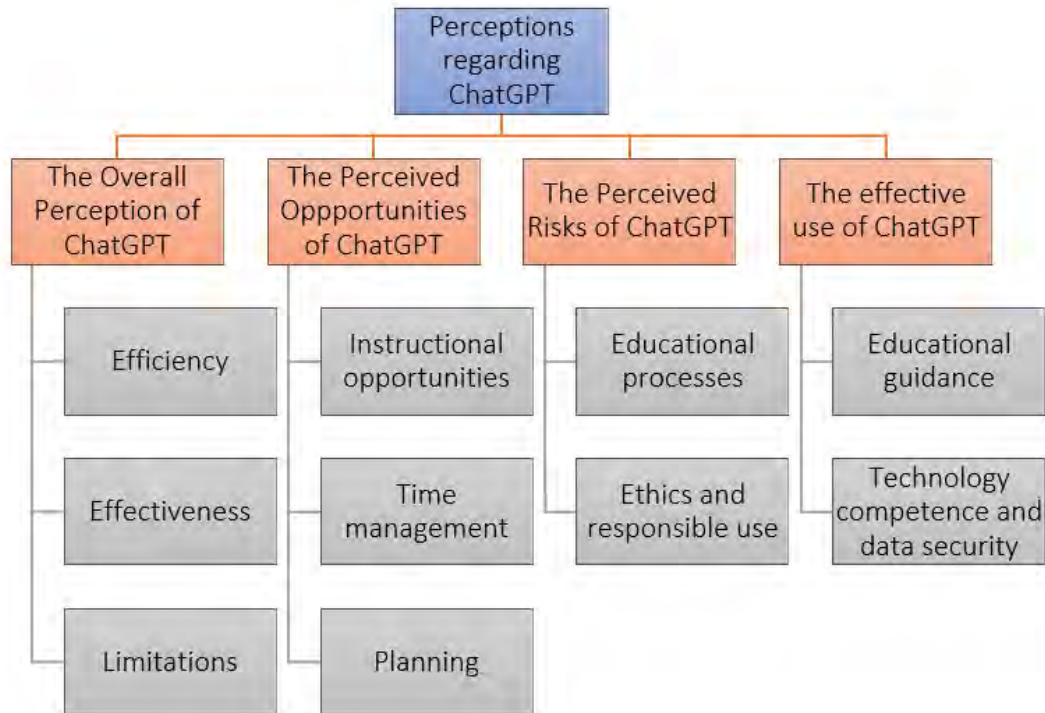


Figure 1. Themes and subthemes regarding teachers' and school principals' perceptions of ChatGPT

As presented in Figure 1, the perceptions of school principals and teachers regarding ChatGPT are categorized under four main themes: overall perception of ChatGPT, perceived opportunities of ChatGPT, perceived risks of ChatGPT, and potential uses of ChatGPT. The first theme consisted of efficiency, effectiveness, and limitations sub-themes. The perceived opportunities of ChatGPT included instructional opportunities, time management, and planning while the perceived risks addressed educational processes and ethical and responsible use. The effective use of ChatGPT was grouped under the educational guidance, technology competence, and data security sub-themes.

4.1. The overall perception of ChatGPT

The details of the overall perception of the ChatGPT theme and its sub-themes are presented in Table 1.

Table 1. The overall perception of ChatGPT

Theme	Subthemes	Codes	f	Example excerpts from the participants
Overall Perception of ChatGPT	Efficiency	Useful	13	<i>"I think it will be useful in education and training."</i> [K7] <i>"I use it in my classes.... I find it useful."</i> [K19]
		Convenient	9	<i>"An artificial intelligence application that makes human life relatively easier."</i> [K8] <i>"...I used it to write texts. It was easier to write using ChatGPT"</i> [K45]
		Helpful	2	<i>"It helps to organize texts while doing research."</i> [K16]
		Practical	2	<i>"I think it is a practical tool."</i> [K17]
	Effectiveness	Responding questions	4	<i>"It is a chatbot which can respond to users' questions."</i> [K11] <i>"...I ask it whatever I am curious about and receive logical, satisfying answers."</i> [K33]
		Translation	2	<i>"It provides convenience in translations..."</i> [K5]
	Limitations	Fast processing	1	<i>"I can access information much faster and find answers to my questions in a very short time..."</i> [K31]
		Encourage laziness	2	<i>"Despite its advantages, it encourages laziness by its ease of use."</i> [K44] <i>"It can render some students lazier."</i> [K48]
		Limit creativity	1	<i>"It can completely kill people's creativity. I don't think it's right to use it in schools."</i> [K2]

As presented in Table 1, the overall perceptions of school principals and teachers regarding ChatGPT involve perceived efficiency, effectiveness, and limitations of using ChatGPT in education. Regarding its efficiency, many of the participants referred to its usefulness (f=13) the most while referring to its being helpful (f=2) and practical (f=2) the least. Regarding its effectiveness, its capability to respond to questions received greater attention (f=4), and its processing speed received the least attention (f=1). The major limitations referred by the participants were its likelihood of encouraging laziness (f=2) and limiting creativity (f=1).

4.2. The perceived opportunities of ChatGPT

The details of the perceived opportunities of the ChatGPT theme and its sub-themes are presented in Table 2.

Table 2. The perceived opportunities of ChatGPT

Theme	Subtheme	Codes	f	Example excerpts from the participants
The Perceived Opportunities of ChatGPT	Instructional opportunities	Preparing course materials	11	<i>"It can make preparing course materials easier."</i> [K7]
		Helping homework	6	<i>"Teachers can ask questions to ChatGPT, and receive help to complete their homework."</i> [K10] <i>"It can help students while doing their homework."</i> [K13]
		Translation	4	<i>"It can produce better results in translating texts."</i> [K1]
		Organizing information	3	<i>"It can organize information for the teacher."</i> [K45]
		Teacher role	2	<i>"It can act like a teacher, in a way."</i> [K5] <i>"It can give instructions like a teacher through coding."</i> [K39]
	Time management	Convenient access to information	15	<i>"It makes assessing information easier."</i> [K11] <i>"During the literature review, instead of searching from various webpages, the research can be completed from a single source."</i> [K20]
		Time-saving and fast	22	<i>"It saves time."</i> [K11] <i>"It helps us use time more efficiently."</i> [K17] <i>"It can provide information and content that teachers and students may need during the lesson in a very short time, and this is very time-saving."</i> [K4]
	Planning	Lesson planning	5	<i>"... it can develop teachers' lesson planning skills."</i> [K33] <i>"It makes lesson planning more efficient and easier for teachers."</i> [K40]
		Customized teaching	4	<i>"It can help teachers give customized feedback and guidance to students with diverse needs."</i> [K5]

As presented in Table 2, the perceived opportunities of ChatGPT involved instructional opportunities, time management, and planning. The instructional opportunity of ChatGPT most frequently addressed by the participants (f=11) was related to preparing course materials. Only two participants referred to its capability to act as a teacher when coded properly. The second opportunity mentioned by the participants was its potential to save time by providing fast access to information (f=37). Participants also underlined its potential to guide teachers while planning their lessons (f=9).

4.3. The perceived risks of ChatGPT

The details of the perceived risks of the ChatGPT theme and its sub-themes are presented in Table 3.

Table 3. The perceived risks of ChatGPT

Theme	Subthemes	Codes	f	Example excerpts from the participants
The Perceived Risks of ChatGPT	Educational processes	Encourage free-riding	28	<i>"Easy access to information can make students get used to free-riding."</i> [K3] [K8]
		Weaken cognitive skills	17	<i>"It might limit students' capacity for analytical thinking."</i> [K6] <i>"It might weaken students' critical thinking skills."</i> [K20] <i>"It kills creativity."</i> [K2] <i>"Students might get used to easy access to information, and this might limit their problem-solving skills."</i> [K1]
	Ethics and responsible use	Provide inaccurate information	9	<i>"It provides unverified information, and thus might give false guidance to students."</i> [K4]
		Weaken human communication	5	<i>"I think it will eliminate concepts such as interactive learning and social learning."</i> [K12] <i>"It will weaken communication between people."</i> [K17]
	Ethics and responsible use	Ethical violation	9	<i>"... there may be problems with citing sources in assignments that require research."</i> [K3] <i>"...may convey false information because it does not specify the source of the information."</i> [K5] <i>"... students might use other people's ideas withing giving reference to them, and this violates ethics."</i> [K5]
		Promote addiction	5	<i>"It can promote students' digital addiction."</i> [K6]
		Security problems	2	<i>"It might promote cheating or plagiarism."</i> [K15]

As shown in Table 3, the perceived risks of using ChatGPT were grouped under the subthemes of educational processes, ethics, and responsible use. The most frequently addressed risk regarding educational processes was the likelihood of encouraging free-riding by means of providing effortless access to information (f=28), which might also be inaccurate (f=9) and weaken students' cognitive skills (F=17). Participants also underlined that the use of ChatGPT can cause ethical violations (f=9), promote students' digital addiction (F=5), and pose security problems (F=2).

4.4. The effective use of ChatGPT

The details of the Effective Use of ChatGPT theme and its sub-themes are presented in Table 4.

Table 4. The effective use of ChatGPT

Theme	Subthemes	Codes	f	Example excerpts from the participants
The Effective Use of ChatGPT	Educational guidance	In-service training	8	<i>"Teachers should be trained about recent developments in artificial intelligence and ChatGPT."</i> [K5]
		Guiding students	10	<i>"Students should be guided its effective use such as preparing study plans or accessing visuals and materials"</i> [K20] <i>"More guidance is necessary for both teachers and students."</i> [K11]
		Age limits	3	<i>"There might be age limits for its use."</i> [K25] <i>"...Estimating the user's age range and restricting the information provided based on their age can make it more reliable for students."</i> [K20]
	Technology competence and data security	Conscious use	5	<i>"...t should be used consciously and in a controlled way due to risks of exaggeration of its use, laziness and lack of confidence."</i> [K6]
		Technology competence	2	<i>"... it might help develop students' technology competence."</i> [K25]
		Verifying data	2	<i>"The reliability of databases used by these technologies to retrieve information should be routinely tested."</i> [K33]

As presented in Table 4, for the effective use of ChatGPT in education, participants recommend offering better guidance and training to both teachers and students ($f=18$), specifying age limits regarding the information that will be provided by ChatGPT ($f=3$), promoting its conscious use ($f=5$), developing students' technology competence ($F=2$), and verifying its data sources regularly ($f=2$).

5. Discussion

The use of artificial intelligence in almost every area of life has made it an indispensable part of getting into the digital world of the 21st century. ChatGPT, as an AI-based system that has developed fast in a very short time span has become one of the most important inventions of the Industry 4.0 era, and accelerated the globalization of education. It seems to remain a focal point of interest for people from diverse fields, including the field of education not only recently but also during the coming. The results of the current study contributed to this quest about the uses of ChatGPT, particularly for educational purposes by revealing school principals' and teachers' perceptions of its early integration into education.

The results of the current analysis revealed that school principals and teachers mostly had a positive attitude towards using ChatGPT for educational purposes and they were quite willing to discover the opportunities provided by ChatGPT. In addition to referring to some of the advantages of using ChatGPT, the participants were also cautious about the risks and offered some recommendations to manage these risks and for their more effective use.

School principals and teachers addressed some major opportunities of ChatGPT such as enabling easy access to information, efficient use of time, and preparation of better course documents. These advantages of ChatGPT were also cited in previous studies (Aktay et al., 2023; Kırtay, 2023; Memorian & Doleck, 2023; Oranga, 2023; Rahman & Watanobe, 2023). For instance, in Ornaga's (2023) study, it was underlined that ChatGPT offered fast and easy access to information from any place and at any

time. Similarly, Memorian and Doleck (2023) stated that ChatGPT provided customized learning and teaching experience. Although our results lend support to their finding, our participants were more cautious about the accuracy of information provided during customized learning settings and the potential of ChatGPT to weaken students' mental capacity. Oranga (2023) supported our finding by pointing to the fact that ChatGPT was never perceived as an alternative to teachers despite facilitating some aspects of teaching and learning.

Participants of the current study also addressed some risks of using ChatGPT in education. Problems related to ethics and responsible use such as cheating and plagiarism, getting students used to free-riding by encouraging effortless access to information, and limiting students' cognitive skills through encouraging laziness. In their study, Rahman and Watanobe (2023) referred to similar risks and underlined the risk of increased cheating and free-riding behaviors among students.

Considering these risks, school principals and teachers in the current study provided some recommendations for better and more effective integration of ChatGPT into education. One major recommendation was related to providing continuous training to both teachers and students about the recent developments in artificial intelligence technologies. In addition, achieving an alignment between the readiness of students and the level or type of information provided by ChatGPT in addition to devising several ways of verifying its data sources to limit the risk of false guidance.

Ultimately, the AI-based tools, which have developed rapidly since the day they were first introduced to the public, have been immediately embraced and used by a segment of society with the potential opportunities they offer, and continue to exist as an outsider that should be approached with caution by another segment of society due to its possible risks. The results of current and prior studies show that despite some prejudices against using ChatGPT, its benefits have begun to be embraced, particularly among educational professionals.

6. Conclusion and Implications

The findings of the current study show that teachers and school principals are cautious about the use of ChatGPT in education considering that these systems bear significant risks, such as unethical use or weakening of students' critical and cognitive skills, perhaps with a perspective based on the traditional understanding of education.

Many studies on the use of ChatGPT in education emphasize that in order to use new generation technologies in education and to provide students with new skills, traditional education approaches to teaching and assessment should be abandoned first. In this context, the significance of using ChatGPT to enhance students' information and technology literacy, to provide customized learning experience and help eliminate students' learning gaps, and to develop their ability to critically evaluate the information provided by these systems before actually using them. These are significant skills to be enhanced to prepare students for 21st-century society. From this perspective, it would also be crucial to make these AI-based systems integral to teacher pre and in-service training so that they can successfully use these tools to provide better and up-to-date instruction.

This study was conducted using only qualitative research methodology. Considering the limitations of this technique, more generalizable results can be obtained by using quantitative or mixed methods of study. The results of the current study as well as the ones provided by similar research in the literature could help devise comprehensive scales to quantitatively measure teachers' and school principals' perceptions on a more global scale.

Declarations

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