

Exploring The Impact and Challenges of Chatgpt on Future Primary and Secondary Education from The Perspective of Current Normal Students

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Abstract. Nowadays, the application of ChatGPT has received widespread attention, but there are still shortcomings at the education level. This article explores the impact and challenges of ChatGPT on future primary and secondary education from the perspective of current normal school students through a survey questionnaire method. The analysis shows that ChatGPT has penetrated the lives of normal students as a commonly used tool. Most respondents believe that ChatGPT will have a positive impact on primary and secondary education. However, regarding the educational evaluation of ChatGPT and the dependence of students on ChatGPT, respondents expressed deep concerns. Based on this, this article suggests that teachers should check the generated content and then integrate it into their curriculum design and use ChatGPT to automatically generate multi-form teaching resources. Teachers can use ChatGPT as a language companion for students' foreign language learning, but they must grasp the time for students to interact with artificial intelligence. Teachers should guide students in the use of ChatGPT, teach students to face the generated content, think from different angles, and form critical thinking. Teachers should educate students on ethics in the teaching process, emphasizing the importance of academic integrity, and at the same time, enriching the ways of evaluating students to ensure the fairness of the examination.

Keywords: Normal students; ChatGPT; primary and secondary education.

1. Introduction

Since the 20th century, with the rapid development of the internet, the application of artificial intelligence has become increasingly fierce. People have applied intelligent AI to various aspects of life. For the education industry, informatization is an inevitable means. In recent years, an emerging tool has sparked heated discussions in society--ChatGPT. ChatGPT (Chat Generative Pre-Trained Transformer) is a chatbot program developed by OpenAI. Since its launch on November 30, 2022, it has accumulated over 1 million subscribers in just one week, attracting widespread attention and discussion from all sectors of society [1]. It is based on the Transformer neural network architecture, processing a large amount of connected data, and generating text based on chat context, which is deeply loved by users.

Existing research indicates that ChatGPT is a great opportunity for the education industry and has a certain promoting effect on teaching activities. Scholars such as Omar have attempted to use ChatGPT as a digital mentor and dialogue partner in English courses, encouraging students to participate in discussions, actively express themselves, and overcome writing fears through step-by-step prompts [2]. Students' abilities in self-directed learning and information decomposition may be improved, corresponding assistance can be provided to students with physical disabilities. The problem of educational inequality may be alleviated. But problems also arose, as the usage standards for ChatGPT were not yet perfect, leading to certain academic disputes. Mbakwe et al. pointed out that ChatGPT is trained on a large amount of raw data that has not been polished, and this training dataset contains biases. The accuracy and objectivity of the information provided are always worthy of caution [3]. The widespread use of ChatGPT by students has fostered bad habits of plagiarism and abuse of intellectual property, promoting academic misconduct [4]. Moreover, the use of ChatGPT is

only a small-scale experiment, and some people are not even aware of this program. There is still no relatively complete system for the specific application of ChatGPT in real education, and it is worth considering and discussing how education should develop in the future.

This article studies the attitudes and usage of ChatGPT among current normal school students, predicts how they will apply ChatGPT to their job positions, and looks forward to the impact of ChatGPT on future teaching. This is of great significance for understanding the impact and challenges of AI chatbot programs represented by ChatGPT on frontline teaching, and for making early response strategies.

2. Method

2.1. Selection of Survey Population and Questionnaire Design

The survey population is selected as normal students who are currently receiving higher education, that is, students whose majors belong to the education direction and whose employment goal is to enter various levels and types of schools or educational institutions to engage in teaching work.

The questionnaire is mainly divided into three parts. The first part is basic personal information, including gender, age, major, and city level. In the second part, the main focus is to investigate the current usage of ChatGPT by this group, including frequency, content, and degree of modification. This section also tentatively sets several questions about the preferences of normal students for using ChatGPT in future work, such as "Do you think you will use ChatGPT for teaching design after becoming a teacher?". The third part focuses on how normal students perceive the impact of ChatGPT on the education industry, setting up some scale questions from both positive and negative perspectives to investigate specific and contextualized views on specific issues. For example, "Do you think ChatGPT can serve as a dialogue partner for students and encourage them in language subject teaching?". Other questions represent more basic values, such as "What attitude do you have towards ChatGPT's impact on the future education industry?".

The questionnaire was open for four days and distributed to the survey population. Ultimately, the group filling out the questionnaire included a total of 158 normal school students from 25 provinces (autonomous regions, municipalities directly under the central government).

2.2. Data Processing Methods

After exporting the data, the first step is to confirm whether any invalid answers need to be removed from the answer sheet, including duplicate submitted answers with the same IP address or with the same selection for each question, as well as answers with the same option for each scale question (for example all 'Strongly agree'). After confirming that none of the answers mentioned above have occurred, use version 4.3.2 of R language for data processing. For all scale questions in the questionnaire, a Likert scale was created using the Likert package provided in R language to present the opinions of the questionnaire group from different perspectives. For each question with more than one correct answer in the questionnaire (including content searched by respondents using ChatGPT, their views on the specific patterns of ChatGPT affecting students, and their views on the specific aspects of ChatGPT affecting primary and secondary education), the proportion of respondents who choose each option is calculated by counting the number of times each option is selected. For each multiple-choice question in the questionnaire (including the average frequency of respondents using ChatGPT, the average degree of modification of ChatGPT generated content, and the overall attitude towards the impact of ChatGPT on primary and secondary education), the proportion of respondents who chose each option is directly counted.

3. Result and Problems

3.1. The Usage of ChatGPT by Normal Students

Regarding the frequency of using ChatGPT among normal students, 41.14% of respondents use it on average between two to five times a week, but only 19.62% use it more than five times a week, and 39.24% use it less than twice a week, meaning they hardly ever use it. Overall, ChatGPT has penetrated the daily learning and life of normal students as an auxiliary tool, and most respondents have used ChatGPT moderately without widespread overuse.

Regarding the purpose and content of the respondents using ChatGPT, the proportion of respondents using ChatGPT to search for information, obtain inspiration and ideas, and write texts exceeds 60%. This may be because the study and homework of normal students during their lifetime included more search and writing tasks. The proportion of respondents who use ChatGPT for chatting is only slightly over 20%, significantly less than the other three categories. This may be because the chat function of ChatGPT is not utilitarian for normal students with heavy academic workloads, most normal students do not choose to spend time chatting with ChatGPT, or the chat content generated by ChatGPT cannot meet the psychological expectations of respondents.

53.17% of respondents modify the content generated by ChatGPT by 25% to 50%, 19% of respondents modify more than half of it, and less than 30% of respondents modify it by less than 25%. It can be seen that normal students generally have a great degree of modification to ChatGPT-generated content. This may be because the content generated by ChatGPT is not precise enough, or there is a certain gap in paragraph format and language style compared to the homework or task requirements that normal students need to submit.

3.2. The Benefits of ChatGPT to Education from the Perspective of Normal Students

In the obtained Likert table (Fig.1), the support rate for all viewpoints exceeds 50%, with the highest support rate being "ChatGPT can reduce the workload of teachers.". According to the framework of the UK's teacher workload survey, the job responsibilities of teachers include not only teaching but also lesson preparation, homework grading, professional development activities, and general administrative work [5]. Existing researchers have found that ChatGPT can serve as an "AI teaching assistant", reducing the burden on some aspects of teacher work, such as helping teachers develop curriculum plans containing different levels of content, generating creative classroom questions to save teachers a lot of time searching for teaching inspiration, ChatGPT can also accurately identify the key points and features of papers to evaluate student papers [6]. Nearly 70% of respondents agree that ChatGPT can improve the efficiency of lesson preparation, while nearly 70% of respondents believe that they will use ChatGPT to collect teaching content when they become teachers. In short, ChatGPT can play the value of intelligent assistants in resource supply, learning situation collection, student evaluation, and other aspects, improving teacher work efficiency [7]. This allows teachers to focus more energy on other aspects of their work, such as improving their professional skills, and the burden on teachers can be reduced.

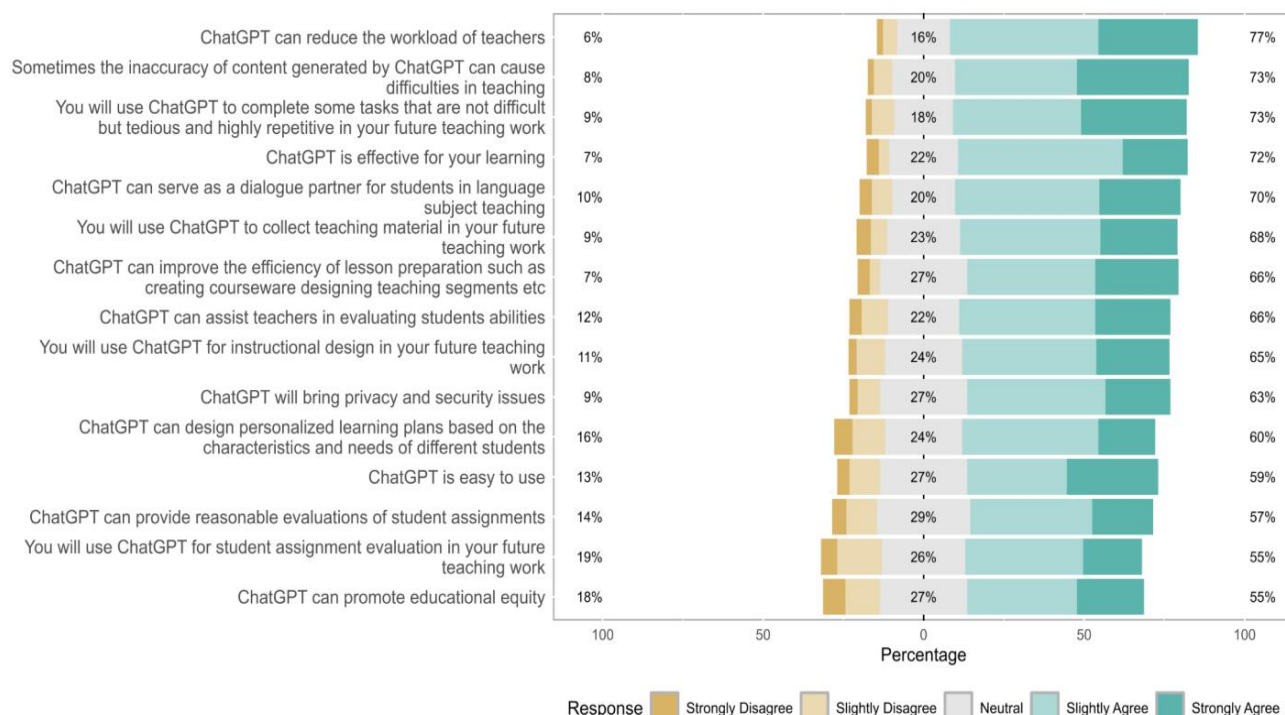


Fig. 1 Recognition of different perspectives on ChatGPT and primary and secondary education among normal students.

The support for "You will use ChatGPT to complete some tasks that are not difficult but tedious and highly repetitive in your future teaching work" is also high, and a large proportion of teachers are strongly supportive of this viewpoint because normal students have realized the advantages of ChatGPT in this aspect in their daily learning, and entrusting some trivial tasks to ChatGPT has become the best choice. An important concrete manifestation of the value of the ChatGPT tool is its efficient and accurate information collection and processing ability, which can obtain and filter a large amount of information in a short period, process a large amount of text data, and assist readers in quickly reading the core information of literature [7]. For teachers, there are many tedious tasks outside of the classroom, which usually have low technical content but require a lot of time to complete. ChatGPT can bring good news to teachers at this level. For example, it can integrate teaching resources on the internet, save teachers time screening teaching materials and writing course notes, and help teachers manage administrative tasks such as class records and work reports.

Many respondents agree that "ChatGPT can serve as a dialogue partner for students in language subject teaching". Current research has found that ChatGPT can help students improve their foreign language abilities in reading, writing, sentence construction, and expression. Moreover, as ChatGPT is based on generative conversational agents, it allows students to practice the language in an environment with lower pressure compared to traditional teaching [8]. Students can freely choose training modes and communication content, and alleviate anxiety caused by fear of making mistakes. This can enhance their confidence and enable them to acquire smoother language expression skills in long-term language learning. However, it is worth noting that normal students are not yet familiar enough with the use of ChatGPT's chat function and may not be familiar with its effectiveness in teaching, so there is a relatively large divergence in views on this issue. Therefore, applying ChatGPT as a chat object in class has great potential and deserves further attention and research.

At a more holistic and macro level, the majority of respondents agree that ChatGPT can impact primary and secondary education by improving teaching methods, increasing teaching resources, and improving teaching efficiency. In traditional education, teachers mainly focus on students' memorization and understanding of knowledge, while ChatGPT can shift the teaching mode from teaching-oriented to learning-oriented, and students' learning methods will also shift from "communication between people" to "collaboration between people and technology". This allows

teachers to focus more on cultivating students' moral character, improving their thinking and creative abilities, and other higher-level aspects [9]. For example, students can use ChatGPT to analyze the motivations of certain characters in literary works, and teachers can further organize students to discuss whether they agree with ChatGPT's analysis, achieving the teaching goal of encouraging students to reflect on their reading comprehension abilities [10]. In addition, ChatGPT can also accurately recommend educational resources represented by MOOCs to students through machine learning methods such as cluster analysis, providing students with opportunities for free choice and self-exploration [11].

3.3. The Challenge of ChatGPT to Education from the Perspective of Normal Students

The survey group holds a relatively optimistic attitude towards the impact of ChatGPT on primary and secondary education as a whole, with only 8.23% of respondents holding a pessimistic attitude. However, it is worth noting that among the respondents who hold an optimistic attitude, the majority choose "Slightly Optimistic", and 25.95% of the respondents hold a neutral attitude, reflecting the general uncertainty and conservative attitude of the normal students toward the future of ChatGPT in the field of primary and secondary education. The technology acceptance model proposed by Davis based on behavioral science theory suggests that the use and acceptance of technology are mainly determined by an individual's intention to use the technology. The intention to use the technology is determined by the attitude towards use and perceived usefulness, while the attitude towards use is determined by perceived usefulness and perceived ease of use [12]. In the questionnaire survey results, there was a high degree of agreement with the statement "ChatGPT is efficient for learning", but a considerable proportion of "somewhat agree", indicating that most people still have a certain reserved attitude towards the issue. The support for "ChatGPT is effective for your learning" is relatively low among all questions, which well conforms to the perspective of the technology acceptance model: the perception of the usefulness and ease of use of ChatGPT by the normal students is not an absolute recognition attitude, and the negative part determines that the group's acceptance of ChatGPT into the field of primary and secondary education is not very high.

More than 70% of respondents believe that the use of ChatGPT in education can create dependency among students, hinder independent thinking, and make it difficult for students to discern the content generated by ChatGPT, leading to misleading situations, they also think ChatGPT may promote academic misconduct. Many scholars have expressed concerns about the predictive situation mentioned above. The dependence of students on ChatGPT may disrupt the development of independent learning abilities, leading to shallow learning and potentially hindering the development of key psychological characteristics and social behavioral abilities [8,13]. What is even more concerning is that research has found that students who use ChatGPT to complete assignments are more likely to engage in academic plagiarism than those who do not. The high-quality writing ability of ChatGPT and its ability to escape traditional cheating detectors are highly tempting for students, who see it as a shortcut to completing tasks, posing significant challenges to the academic integrity of both students and institutions [4]. The proportion of respondents who support the statement that "Teachers find it difficult to discern the true mastery of students " is relatively low. This may be because the problem is highly contextualized, and normal students are still unable to truly judge whether they can evaluate students' abilities from the perspective of teachers in an environment where ChatGPT is highly applied.

The respondents have a lower level of recognition for the two questions "ChatGPT can provide reasonable evaluations of student assignments" and "You will use ChatGPT for student assignment evaluation in your future teaching work". The proportion of opposition to "ChatGPT can assist teachers in evaluating students' abilities" is significantly higher than the adjacent questions in Fig.1, indicating that the normal students are not optimistic about the application prospects of ChatGPT in evaluation. Scholars have argued the necessity of this concern, as the training of ChatGPT comes from existing evaluation data, it may only be suitable for exams with higher standardization levels.

For more complex and flexible tasks, ChatGPT currently lacks training to calibrate or weigh the unique variables of each task, resulting in poor evaluation performance on such tasks or exams [4].

4. Suggestion

Based on the analysis of data, different benefits are identified in different teaching stages. Therefore, it is necessary to have a correct view of ChatGPT and consider how to use it as an effective tool in the teaching and educating process rather than simply disabling it. At the same time, some existing problems were also discovered, mainly in these aspects - the impact of the use of Chat GPT on normal students and the impact on their future teaching.

4.1. The Appropriate Use of ChatGPT as an Auxiliary Tool

In the process of instructional design, teachers need to prepare curriculum standards, textbooks, and teaching methods. Using ChatGPT in these processes can help teachers improve their work efficiency. But when using it, teachers should also pay attention to the amount of intelligently generated content.

ChatGPT, as a well-developed generation of artificial intelligence, can serve as an auxiliary tool for teachers. For example, in the process of preparing for a literature or history class, teachers can use ChatGPT to supplement students with information on the author's life, era background, class background, etc. by inputting the keywords, so that students can better learn and understand the content of this lesson. Considering that ChatGPT is the retrieval and processing of most data, there may be issues with information accuracy. It is recommended that teachers select some useful fragments, grasp the course progress based on the course content after obtaining relevant content, and when finishing the inspection, integrate them into their own course design to ensure the rigor of teaching and avoid the similarity in teaching content and process.

In the teaching process, teaching resources and tools can enhance teaching effectiveness, enabling students to understand knowledge more deeply and apply skills in a relaxed atmosphere. After determining the teaching objectives and framework, teachers can take advantage of ChatGPT's application in technology development resources to automatically generate multiple forms of teaching resources. Not only does it save teachers the time and cost of searching for resources, but it also enriches the form of teaching content and increases the depth of resource exploration.

4.2. The Assistance for Students in Completing and Practicing Language Input

Attending classes is an important part of implementing education and teaching. The proper use of ChatGPT can help advance the teaching process and also form a closed loop between teaching objectives, teaching design, and actual classroom activities.

For example, Professor Stavros from the University of Patre in Greece introduced ChatGPT into high school English writing classes. During the revision phase of the writing class, ChatGPT was used in three parts. Firstly, use ChatGPT to correct students' vocabulary and grammar errors. Secondly, students need to compare, analyze, and learn from the revision suggestions proposed by ChatGPT. Finally, use the newly learned expressions again to write an essay on a similar topic. During this process, teachers guide students to train in critical thinking, and students internalize pragmatic knowledge and skills through interaction. This can also be used in other language writing and speaking courses.

In the process of learning a language, students need to repeat the process of language input and language output. The input of language including some good phrases, advanced expressions, or novel ideas can supplement the insufficient corpus for students when learning a new language. The output of language can help students internalize these new ways of expression into their own through continuous practice and autonomous use.

Therefore, ChatGPT can become a good language companion for students in the process of language learning. However, it should be noted that during this process, teachers should seize the

time for students to interact with artificial intelligence to avoid students being immersed in it and lacking interpersonal interaction with peers and teachers. Teachers should pay attention to the emotional development of students and the formation of a healthy personality [14].

4.3. The Development of Critical and Divergent Thinking

With continuous updates and iterations of artificial intelligence, ChatGPT can to some extent intelligently and personally generate answers based on students' responses, so the guidance of teachers is important [14]. After receiving the answer from ChatGPT, the guidance to judge whether the content provided is true based on the student's existing knowledge is the first thing, so that the student can establish an accurate view of right and wrong. On the other hand, students can obtain different information and perspectives from ChatGPT's answers, which can help them give examples to support their viewpoints and also discover shortcomings in their viewpoints, filling the gaps brought by the lack of professional knowledge.

Therefore, in this era of information diversification, students need to cultivate critical thinking to help distinguish truth from falsehood when facing various levels of quality content. Besides, while obtaining other people's opinions or ready-made content, they can think about the essence of the events from different perspectives and improve innovation ability.

4.4. The Establishment of Correct Value Orientation for Students

There is an ancient Chinese saying: A teacher could propagate the doctrine, impart professional knowledge, and resolve doubts. As a teacher, giving a good lesson is not only about imparting knowledge, but more importantly, it is about shaping students' outlook on life, values, and the world. In this regard, although ChatGPT can bring convenience to the teaching process, it cannot be denied that it is just an intelligent tool and cannot replace teachers in educating students. Teachers should educate students to establish a scientific concept of integrity and a sense of responsibility so that they can become artificial intelligence users with autonomous learning awareness [14]. It is necessary to teach students to use ChatGPT appropriately in their studies, daily life, and interpersonal relationships, and leverage the positive value that ChatGPT can bring to students, helping them with their learning and overall development.

Secondly, after using artificial intelligence tools to complete tasks or achieve good grades, students will become dependent on intelligent tools, thus developing a mentality of inertia [6]. To avoid this, ethical education is required in the process of teacher education and teaching, allowing students to understand and learn about academic integrity. At the same time, teachers need to enrich the ways of evaluating students and increase the diversity of ways to test their learning outcomes. It is necessary to clarify which content can be completed by students using ChatGPT and to minimize the occurrence of this part of content during the test. For the parts that students must complete through their independent thinking, different evaluation models can be adopted, such as comprehensive exam content demonstrations, and project implementation, and some specific students' abilities, which ChatGPT has not possessed yet, should be focused on such as analyzing cases, on-site records, and observing details, to avoid students using ChatGPT for cheating and examine students' abilities from different dimensions [9].

Therefore, teachers need to adhere to the principle of putting people first, pay attention to the cultivation of students' emotions and morals, and promote students' comprehensive development.

5. Conclusion

In this study, the attitude and usage of ChatGPT among current normal students were seen by analyzing the collected data.

Research shows that most people hold a relatively optimistic attitude towards the impact of ChatGPT on future education and teaching, especially in improving teacher work efficiency. However, at the same time, in some opposing views, this paper also found that ChatGPT poses some

challenges to future primary and secondary education, such as whether the information is completely true, whether students will form a dependence on ChatGPT and whether it will influence the comprehensive cultivation of student abilities and thinking.

To address these challenges, it is recommended that teachers first ensure the accuracy of information when using artificial intelligence tools. In this process, it should adhere to a student-centered approach, guide students to make independent judgments after obtaining relevant content, and also train them in divergent thinking. Finally, when evaluating students' academic abilities, diverse evaluation models should be adopted, and abilities that have not yet been covered by artificial intelligence should be examined comprehensively to avoid excessive use of artificial intelligence to avert academic misconduct by students.

The evaluation of students' learning achievement is an essential step in achieving a closed teaching loop, so ChatGPT still has a lot of room for development in this area.

Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

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