The Impact of Chat GPT On the Role Transformation of Chinese Public Junior High School Teachers

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Abstract. The use of Chat GPT in the classroom has been receiving widespread attention, but research on its impact on the role transformation of middle school teachers is still lacking. This paper analyses the challenges that the application of Chat GPT poses to teachers and classroom teaching in Chinese public junior high schools. The analysis concludes that the application of Chat GPT will challenge the teacher's subject position as a single lecturer, the traditional knowledge system, and the classroom teaching model. Students' information literacy will also affect the consequences of the use of Chat GPT in the classroom. Based on these findings, this paper proposes the following suggestions: teachers should be transformed from traditional single-classroom instructors, skilled laborers, and professional knowledge transmitters into leaders of human-computer collaborative teaching, explorers of innovative classrooms, and leaders of information literacy. In this way, teachers in public junior high schools could find themselves still important to students in the classroom.

Keywords: Generative Artificial Intelligence; Chat GPT; Teacher Role; Teacher Transformation.

1. Introduction

In recent years, the development of Artificial Intelligence (AI) has brought about profound impacts and changes in all walks of life. One of the most far-reaching impacts is the Chat GPT big language model developed by Open AI, which is based on a big data training set for anthropomorphic Q&A interactions. The number of active users of Chat GPT reached an astonishing 100,000,000 per month in 4 months after its introduction, breaking the historical record for the fastest user growth, and demonstrating its wide-ranging impact on a variety of industries [1].

Due to its features such as personalized learning support, convenient and rapid real-time Q&A, and rich library, it is clear that Chat GPT can provide both teachers and students with new tools and more available resources in the education sector, thus improving teaching and learning efficiency in the classroom and opening up new opportunities for teacher development [2]. However, on the other hand, the opportunities brought by generative AI are always accompanied by challenges and risks: although some scholars have already shown that Chat GPT is not likely to replace the role of teachers in the classroom, but rather to join the classroom as a supplementary tool, its powerful functions and convenience still bring comprehensive and profound impact and challenges for teachers, especially triggering the 'Teachers as Teachers' concept, which is a new concept in the field of generative AI [3]. Its powerful functions and convenience will still bring about comprehensive and profound impacts and great challenges to teachers, especially triggering the legitimacy crisis of 'teachers as human beings' [4,5].

Therefore, in the classroom situation where generative AI is present, the convenience provided by Chat GPT for both teachers and students will transform the interaction mode between teachers and students, which will lead to changes in the structure of the classroom, and how to use Chat GPT, how to adapt to the classroom teaching mode in the presence of Chat GPT, and even how to guide the students to use Chat GPT correctly, will become major challenges for teachers in the era of generative AI. In the face of these challenges, the traditional classroom experience will no longer apply to a certain extent, and teachers will have to take the initiative to adjust their roles to adapt to this change so that they can make effective use of this emerging auxiliary tool to improve the quality of teaching and classroom efficiency in the presence of Chat GPT [6,7].

Obviously, in this changing trend of teaching brought by AI, teachers are no longer able to face so many challenges with their traditional role as a single knowledge transmitter. Therefore, in response to the transformation of the teacher-student interaction mode and the change of classroom structure in the AI-involved classroom, teachers need to actively and positively change their roles to adapt to the trend of the times, and it is undoubtedly of great significance and urgently needed to solve the problem of exploring in what direction teachers should transform and how to transform themselves.

2. Education Model and Teachers' Roles

In the traditional education model of Chinese public junior high schools, the classroom often consists of two main bodies: the teacher, who is the transmitter of knowledge, and the students, who are the recipients of knowledge, thus forming a dichotomous structure of teaching and learning. In this traditional dichotomous and simple structure, the interaction between teachers and students is often characterized by one-way transmission - what and how students learn in the classroom depends on what and how the teacher teaches. And because of the uniformity of the syllabus and the purpose of the final exam, even though teaching styles and content may vary according to the individual characteristics of the teacher, there is not much variation between classes or even between schools overall. At the same time, due to the limited scope of the syllabus and the scarcity of extracurricular sources of knowledge, even if students sometimes question the teacher's teaching, these questions are always focused on what they have already learned. And in most cases, students ask questions to better understand the knowledge, rather than questioning the correctness and timeliness of the knowledge.

In such a classroom system, the norms of relevant education are well established: there is almost always a consensus on what teachers teach in the classroom and how students should learn. In contrast, textbooks are published - meaning that the knowledge that is taught and learned is preserved and fixed in such a way that, even if they undergo updating now and then, the changes tend to be only minor corrections and replacements. In general, textbooks represent a limited, predictable, and stable range of syllabi within which all teaching and learning always takes place.

When Chat GPT is introduced into the classroom, the established classroom structure will inevitably change, and the original classroom rules and paradigms will be challenged. How will teachers be challenged and how will they be transformed to cope with the shift from binary to ternary roles, richer sources of knowledge, and changes in the traditional classroom structure?

3. Impacts and Challenges of Chat GPT for Teachers

3.1. Chat GPT Brings Challenges to the Teacher

The introduction of Chat GPT breaks the dichotomy in the traditional classroom and affects the teacher's role as a single knowledge transmitter. As previously mentioned, the classroom in junior high school mainly consists of two main subjects, the teacher and the students, and the transfer of knowledge and information exhibits the characteristic of one-way transmission. Once Chat GPT is introduced into classroom teaching, it will inevitably lead to a certain degree of a shift in the classroom structure from binary to ternary, and the relationship between teachers and students will also change, thus posing a challenge for teachers.

Due to the intervention of Chat GPT's anthropomorphic Q&A experience makes students less dependent on the teacher for answers to their questions, which reduces the number of interactions between teachers and students and weakens the teacher-student bond, thus alienating the teacher-student relationship to a certain extent.

In the question-oriented learning process, traditional teachers are limited by the scope of their knowledge and experience and the limited time, it is impossible to meet the needs of all students at the same time. Chat GPT's huge database, anytime, anywhere access characteristics, and almost zero cost of the question and answer can provide students with a more accurate and convenient Q&A experience, so it is more suitable to become a personalized personal assistant for the students in the

learning process and provide students with personalized answers at any time. Therefore, it is more suitable to become a personalized assistant for students in the learning process, providing answers to their questions at any time.

In addition, in the traditional classroom, students' questions are not only limited by their level of understanding, but also need to consider the teacher's impression: whether asking such questions will make the teacher feel that they are not listening carefully, or whether other concerns will lead to negative comments from the teacher will often make it difficult for students to ask simple but important questions, leading to unresolved questions, which will largely affect students' understanding in the classroom. Students' understanding of the classroom was greatly affected. There are no such concerns when asking Chat GPT questions, and students do not need to consider the impression or patience of the AI when dealing with it as a tool.

Thus, as far as question answering is concerned, Chat GPT is better suited than the teacher to be the student's advisor and thus personalize the student's query. However, in response to this scenario, some scholars have pointed out that the anthropomorphic companionship of AI based on Q&A may lead to an emotional addiction problem that is more serious than internet addiction, causing students to become immersed in it and refuse to communicate with their real-life teachers and parents [8]. This reveals to a great extent that students with Chat GPT collaboration will marginalize the role of the teacher to some extent. While the teacher is firmly at the center of the classroom as the sole knowledge transmitter in the traditional classroom, when generative AI is introduced into the classroom, the teacher is forced to share the status of the knowledge transmitter with him/her, thus weakening his/her absolute centrality.

Thus, although Chat GPT cannot replace the teacher's position in the classroom, it attracts students away from their dependence on the teacher's classroom lectures to independent learning due to its complete knowledge and flexibility, thus weakening the teacher's position as the main knowledge transmitter. If teachers are not able to find their unique value in the new teacher-student interaction and strengthen it, it may lead to the undermining of the teacher's subjective position [9].

3.2. Chat GPT Poses Threats to the Traditional Lecture Knowledge System

The introduction of Chat GPT in the classroom will, to a certain extent, subvert the original traditional lecture knowledge system, questioning what and how teachers teach.

Due to its rapid response speed and comprehensive knowledge reserves, Chat GPT can provide students with more comprehensive knowledge at a lower cost, thus providing a more personalized learning path - students can ask questions according to their own pace and receptive ability, thus generating an independent learning mode with questions as the main means [10]. In this case, students' exploration of knowledge is no longer constrained by the knowledge transmitter, and thus extends beyond the boundaries of the textbook to a deeper and broader body of knowledge, in contrast to the traditional model of classroom instruction that limits what students can learn.

Thus, in a Chat GPT-engaged classroom, the teacher can provide a starting point for knowledge but cannot define the end point of student exploration. This means that teachers will have to rely much less on textbook content in their lesson planning. In contrast, the traditional textbook-based teaching system will be dismantled, and the uncertainty of the scope of knowledge will largely make the traditional mode of classroom delivery less efficient, while the level of student proficiency may become more polarized as a result. Teachers will be less able to rely on previous experience and will need to be prepared to adapt their classroom models to respond to students' knowledge that is beyond the scope of the classroom.

3.3. The Disadvantages of Students' Use of Chat GPT in Classroom Learning

When generative AI is applied to the classroom, whether it facilitates or inhibits the process of classroom efficiency and knowledge transfer depends largely on the information literacy of students. Students at the junior high school level are not yet experienced in the world and often have problems

such as gullibility of information without screening and lack of moral value judgment, which will hinder the learning process and thus challenge teachers.

Dependency issues. Students tend to become dependent on the use of Chat GPT without guidance, and the overuse of generative AI will lead to the absence of independent thinking, which in turn will lead to a lack of absorption of classroom knowledge and the loss of the classroom's relevance; this will also lead to the impediment of students' skill development, as Chat GPT replaces the process of analyzing and writing, which in turn will exempt the students from exercising and reflecting on the process. Reliance on Chat GPT could also create academic ethics issues; students using Chat GPT to complete assignments are essentially plagiarizing web content, in which teachers would be hard-pressed to detect traces of AI. Previously, teachers have already found students using generative AI in tests and assignments with answers that are correct enough to help them pass the quiz [11]. For middle school quizzes with a small percentage of subjective questions and most questions with unique objective answers, Chat GPT appears to be relatively comfortable and, thus more likely to lead to dependency issues that are not conducive to the absorption of pedagogical knowledge.

Creativity Inhibition. Unlike face-to-face interaction with a teacher, Chat GPT, while providing explanations or answers to questions more easily, makes it difficult to provide deeper questions to stimulate divergent thinking in the same way that teachers do. Prolonged use of Chat GPT may lead to a lack of divergent thinking in the learning process, which in turn undermines students' creativity.

Information accuracy issues. Although Chat GPT's database-based responses are logical and relevant and often meet the needs of users, their accuracy cannot be guaranteed; Chat GPT's data retrieval is limited by the period and spatial breadth of the database, which means that there may be problems with the timeliness of the responses and the reliability of the information. Junior high school students are relatively weak in information screening, and the absorption of unreliable information from unattributed sources may cause problems in later learning.

Therefore, in the era of generative AI, students' lack of information literacy will also create problems that will either indirectly or directly affect the classroom. Teachers should be prepared for these problems.

4. Transformation Path of Teachers

4.1. Transform from the Traditional Single Classroom Instructor to the Leader of Human-Computer Co-Teaching

Consciously cooperating with AI and mastering the initiative of human-computer collaborative teaching is the primary task of teachers in the era of Chat GPT. The popularity and use of Chat GPT are bound to be the trend of the future, and it is not a wise choice to prevent the use of Chat GPT in the classroom at a time when every industry is investing in the use of generative AI to improve work efficiency. It is more important to accept the use of generative AI in the classroom with an open and tolerant attitude and to handle the human-machine relationship correctly and positively. This requires teachers to change the traditional view of teaching, think about the missing part of Chat GPT in education, and make up for it, to make the human-machine complementary, each in its own way, to give full play to the maximum effectiveness of human-machine co-operation [12].

For example, although Chat GPT has a more complete and comprehensive knowledge system, its presentation based on textual answers brings great limitations. Teachers' presence and rich classroom teaching performance are obviously beyond the reach of AI technology at this stage. Therefore, teachers can focus on strengthening human interaction, paying more attention to the interaction between teachers and students and interpersonal values, and guiding students to participate in human-centered and Chat GPT-assisted interactive discussions. Outside the classroom, teachers can also take the initiative to share their knowledge, experiences, and interests with students, guide students to divergent thinking by using the method of guiding them in a good way and tailoring their teaching to the needs of the students, cultivating their creativity and building an emotional bridge between

teachers and students. They can nurture students' creativity and build an emotional bridge between teachers and students.

4.2. Transform from the Skilled Laborer Relying on Accumulated Experience to the Explorer of Innovative Classrooms

Chat GPT challenges the boundaries of textbook knowledge, forcing teachers to reform their classroom models. Teachers are largely unable to predict what kind of expertise students will receive, how accurate it will be, or whether it is beyond their level of understanding, and the traditional classroom model, which confines the teacher to the textbook, is not able to cope with students' exploration of knowledge beyond the textbook.

To cope with this situation, teachers need to consciously change the classroom teaching model. In the case that students are generally able to develop problem-oriented independent learning by asking questions on Chat GPT, teachers can set aside more time in the classroom or interspersed with discussion sessions to guide students to carry out communication within the class, to promote unity of the class level through mutual communication among students, and to understand the learning situation of the class through the way of students' questions and teachers' answers and to provide corresponding guidance, and to prevent students from learning beyond the scope of their comprehension. Prevent students from saber-rattling on knowledge that is beyond their ability to comprehend, affecting classroom efficiency and learning confidence.

4.3. Transform from the Professional Knowledge Transmitter to the Information Literacy Leader

Given that the effectiveness of the use of Chat GPT in the classroom depends on students' information literacy, teachers must cultivate and lead students' information literacy. Therefore, in the teaching process, teachers should not only act as the transmitter of professional knowledge, with the sole responsibility and purpose of delivering knowledge but should also consider the cultivation of students' information literacy and the development of good information habits and the cultivation of information literacy [13]. Guidance in information literacy can be specifically developed in terms of information awareness, collection ability, assessment ability, ethics, and application ability.

Information Awareness: in a classroom system where Chat GPT is involved, students should be aware that the use of AI in the classroom will contribute to personalized learning. Without being guided, some students may find it difficult to realize the convenience and importance of using Chat GPT for learning, which may cause these students to lag behind the class as a whole. Therefore, teachers should guide students to recognize the importance of information competence and develop their information awareness.

Gathering ability: even if all students in the classroom can realize the importance of using new information tools to assist their learning, differences in information-gathering ability between individuals will lead to different levels of students. When confronted with generative artifacts, the main form of collection is questioning, and the quality of the questioning will be directly related to the accuracy of the answers obtained. Teachers should consciously model and guide junior high school students who are not yet able to accurately summarize their thoughts and ask precise questions.

Assessment Skills: As mentioned earlier, Chat GPT responses still have accuracy issues. Its time limitations and the source of its data dictate that its responses may contain content that is outdated or inaccurate. Failure to screen for this content can lead to problems in learning. For junior high school students, the awareness of information screening is relatively low, so it is necessary for teachers to actively guide students to evaluate the information they collect and to develop the habit of not trusting and valuing the data sources.

Ethics: Clearly defining the boundaries of the use of Chat GPT in learning is quite important for both students and teachers. Teachers should clearly define ChatGPT in which learning scenarios it can and cannot be used and give reasons why it is acceptable to students as part of the teacher's obligation in the teaching process [14]. Since it is difficult for teachers to know how students use

Chat GPT, the only factor limiting the use of generative AI becomes the discipline and statute of the students themselves. Therefore, teachers must find ways to make students understand the advantages and disadvantages of using Chat GPT and design appropriate use scenarios according to different educational goals, different teaching scenarios, and students' specific situations. Clarify which tasks can be introduced to Chat GPT and which ones cannot; which learning tasks are acceptable and unacceptable to be completed with the assistance of Chat GPT; and to what extent students' use of Chat GPT can be counted as cheating and breach of trust issues.

Ability to apply: In addition to gathering information through generative AI, it is equally important to apply the information afterward. Copying the information in its entirety is detrimental to the student's ability to think independently and to be creative. Therefore, it is also important for teachers to instruct students how to reasonably apply the collected information in the classroom, to achieve twice the result with half the effort and self-improvement.

5. Conclusion

Thus, in today's era where generative AI is gradually making its way into the classroom and can play an important supporting role in the classroom, the identity and status of the teacher are quite challenged. In the face of Chat GPT's more convenient and comprehensive questioning experience, the teacher's identity as a single knowledge transmitter is challenged. Therefore, teachers should take the initiative to explore the shortcomings of Chat GPT and supplement and develop it, to build and lead the classroom teaching mode of human-computer collaboration and pay more attention to students' interpersonal skills while teaching. In the face of the challenge of Chat GPT to the traditional relatively fixed classroom mode, teachers should actively develop their initiative, take the initiative to reform the teaching system and teaching methods, take lifelong learning as the goal, and constantly broaden their knowledge to adapt to the AI-assisted classroom mode, as well as to carry out more student-led classroom discussion and exchange activities, always pay attention to the performance and ability of students. As for the problems that may be brought about by the use of Chat GPT itself, teachers should still actively guide students to improve their information literacy, from information awareness, collection ability, assessment ability, ethics, application ability, etc., so that students can become familiar with the classroom mode of Chat GPT participation and be skilled in the application of AI, thus assisting their learning. At the same time, the disadvantages arising from the use of AI are also minimized.

Therefore, in the face of the wave of the era of Chat GPT, it is more important for teachers to exert their subjective initiative, from the traditional single classroom transmitter to become the dominant player in human-computer collaborative teaching, from the skilled worker relying on cumulative experience to the explorer of the innovative classroom, from the transmitter of professional knowledge to the leader of information literacy, and to innovate and lead actively in the event of the experience no longer being applicable, thus maximizing the efficiency of the classroom and bringing the students the best possible learning experience. They will actively innovate and actively lead the classroom when past experiences are no longer applicable, to maximize classroom efficiency and bring the best classroom experience to students.

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