The Impact of ChatGPT on University Teacher-Student Interactions

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Abstract: ChatGPT technology came into being in the era of artificial intelligence, and its impact on the field of education has attracted wide attention from the academic community. Among them, the participation of ChatGPT will promote the transformation of the interaction between teachers and students, from the traditional dual structure to the 'teacher-student-machine' ternary human-computer cooperation model. This paper aimed to explore the influence of ChatGPT technology on teacher-student interaction in university. Status, opportunities, and challenges of ChatGPT participation in teacher-student interaction are found to be the main part of the findings. Through interviews with university teachers and students who used ChatGPT to participate in interaction. It is found that ChatGPT's involvement in teacher-student interaction can provide a large number of high-quality information resources for teachers and students in real-time according to their individual needs. At the same time, it can also be used as a medium for teachers and students to better and equally communicate, bridge intergenerational differences, and help to achieve benign teacher-student interaction. On the other hand, the teacher-student interaction has become more complicated. Indirectly, the traditional authority of teachers has been threatened. In addition to the lack of supervision means of ChatGPT in the education field currently, some students rely on AI to replace themselves to complete academic tasks. Besides, academic misconduct also occurs frequently, which challenges teacher-student interaction. Given the above research results, relevant suggestions are put forward to meet the challenges.

Keywords: ChatGPT, teacher-student interaction, education, opportunities, challenges

1. Introduction

The emergence of ChatGPT has provided more opportunities for school education but also brought new challenges to teacher-student interactions. The application of new tech means may make educational activities break through the established traditional mode, bringing about the overall change in educational form and the thinking of humanistic education and man-machine relationship in education will promote the more profound education reform.

In the field of education, teacher-student interaction is an important form of interaction. Ye zi and Pang Lijuan argued that 'teacher-student interaction particularly refers to the interaction and influence

of various forms, nature, and degree occur between teachers and students [1]. Teacher-student interaction refers to all the interactions and influences that occur between teachers and students. It is a special and main form of the interpersonal interaction system between teachers and students.' Teacher-student interactions include classroom interactions, homework assignments, and post-lesson communication.

In terms of the application of ChatGPT in teacher-student interaction, Song pointed out that "education is interactive, complex, co-operative, open, growth-promoting, practical, social, unpredictable and creative [2]." With the participation of ChatGPT, the teacher-student interaction has changed: from the original directness to indirectness, it has enhanced students' participation and enthusiasm, and the form and content of interaction have become more open and diverse, but it also faces challenges.

With the continuous development and popularization of ChatGPT technology, teacher-student interaction is facing new changes. ChatGPT, as a new artificial intelligence technology, accelerates the advent of the era of symbolic pedagogy and redefines the teacher-student interaction. Wang Hongcai and Zhong Binglin et al. argued that the integration of ChatGPT and education will bring challenges to educational methods, educational scenarios, and educational transformation, and the need to provide teaching resources, technical strategies, and frameworks [3]. In this context, changes in educational goals, educational methods, educational scenarios, and educational organizations will affect the development of teacher-student relationships, bring great challenges, and reshape the education system. In the past education field, the interaction between teachers and students was often regarded as a one-way knowledge imparting. Nevertheless, with the advent of the era of artificial intelligence, teacher-student interaction has gradually formed a ternary structure. In the symbolic era, teacher-student interaction needs to pay more attention to humanized education methods and improve the quality of education. Therefore, as an auxiliary tool, ChatGPT can provide an interactive platform for teachers and students, so that students can ask questions, express and communicate more freely, and also provide more opportunities for feedback and guidance for teachers.

While ChatGPT has the effect of personalized teaching, it also brings more challenges. Li Huichun pointed out that "AI challenges teacher-student ethics with a duality in terms of whether it facilitates or undermines teacher-student interactions [4]." Wang Youmei, Wang Dan, and Liang Weiyi also believed that the emergence of ChatGPT brings some potential risks to both sides of teacher-student interaction, such as exacerbating insecurity, weakening emotional connection, sense of responsibility, and imbalance of evaluation mechanism [5]. Thus, in the future development of education, scholars should attach great importance to these issues and think about countermeasures.

Accordingly, under the impact of ChatGPT, the education field needs to pay more attention to the teacher-student interaction, and pay more attention to the humanized education mode under the teacher-student interaction. Future research should further explore the practical application of ChatGPT in teacher-student interaction and its influencing factors and countermeasures in the field of education. For example, interaction and communication between teachers and students need to be strengthened to avoid ChatGPT replacing the role of the teacher. At the same time, an effective evaluation mechanism should be established to ensure that the use of ChatGPT does not undermine the quality of education.

In summary, the application of ChatGPT in the field of education has a broad prospect but also faces great challenges. The ternary structure of teacher-student interaction will be an indispensable part of the future educational structure [13]. While ChatGPT technology offers new ideas and innovations in teacher-student interactions, it brings risks that need to be reflected upon and explored in practice to facilitate the continuous development of an increasingly diversified education.

From past research, many scholars have focused on the impact of ChatGPT on the educational environment and specific subject learning and discussed the ethical relationship between teachers and

students. However, there are still some shortcomings in research on the change and influence of ChatGPT on the interaction between teachers and students. First of all, the integration of ChatGPT into the classroom has not been realized, and the application of ChatGPT in the interaction between teachers and students is still missing, with a single respective, and the students who use this technical means are mostly concentrated in college students; Secondly, the researchers have little prospect and expectation for the application of ChatGPT in the teacher-student interaction, and there is great controversy about the formal introduction of ChatGPT into education. Thirdly, most of the previous studies focused on the impact of ChatGPT on the field of education, while there was less discussion on the challenges and countermeasures of teacher-student interaction.

To explore the changes and challenges in teacher-student interactions brought about by the application of ChatGPT in university education.

2. Methods

2.1. Design

The determination of the research purpose and research object is an important step, which has guiding significance for the in-depth development of the research. In this study, the research object is the interaction between university teachers and students, and the research market is the application of university education. This study aims to explore the changes and challenges of teacher-student interaction in the application of ChatGPT in college education, using semi-structured interviews for data collection and analysis.

2.2. Data Collection

To achieve the purpose of the study, the following steps were used for data collection and analysis. Firstly, determine the research topic. The theme of this study is to explore the changes and challenges of teacher-student interaction in the application of ChatGPT in university education.

Secondly, conduct necessity and feasibility analyses. After the identification of the research topic, necessity and feasibility analyses should be conducted. The interview method could be used to gain a more in-depth understanding of the attitudes and perceptions of the university's teachers and students regarding the use of the ChatGPT to participate in teacher-student interactions, to better realize the purpose of the research.

Moreover, determine the interviewees. According to the principle of interview sample selection, the representatives of university teachers and students using ChatGPT were selected for interviews. Each group included 2 teachers and students, a total of 4 respondents. The interviewees include Student A (male, a junior majoring in finance, Boston University's Faculty of Humanities and Sciences), Student B (female, a senior majoring in English, Shanghai Normal University's Faculty of Foreign Languages), and two teachers: Teacher A (male, Associate Research Fellow) and Teacher B (female, Research Fellow).

Next, prepare interview outlines. Based on the objectives of the study and the literature review, semi-structured interview outlines were prepared to ensure the quality and validity of the interviews.

Then, conduct the interview. Interviews were conducted online and approximately lasted 30 minutes each, with responses and perspectives of the interviewees recorded.

Finally, conduct the data analysis. The interview transcripts were transcribed verbally and analyzed for content to extract and collate the responses and commonalities of viewpoints of individual interviewees. In the end, the data were integrated and categorized to conclude.

Through the above steps, this study aims to gain a deeper understanding of the attitudes and feelings of university teachers and students towards using ChatGPT to participate in teacher-student interactions, to better explore the changes and challenges of teacher-student interactive relationships

brought about by the application of ChatGPT in university education. At the same time, this study provides useful lessons and references for practice in the field of university education.

3.   Result

3.1.   Status of ChatGPT Participation in Teacher-Student Interaction

In today's immature stage of ChatGPT development, the integration of this technology into the entire educational process has not yet been realized so the practical use of the technology in teacher-student communication is less frequent and mostly concentrated after class. Regarding the current scenario of ChatGPT's participation in teacher-student interaction, interviewee Teacher B said, "It is mostly used when I ask a question to a student, and the student sometimes uses ChatGPT to search for the question, which helps them to answer the question more professionally. Students see ChatGPT as a tool for them to explore the question and find the answer again, then give it back to me", while interviewee Student B stated that "sometimes when the question teacher asks is more abstract or difficult to understand so that they can't find the answer on their own, they will use ChatGPT to get some inspiration or answer to respond to the teacher ".Therefore, the scenes in which ChatGPT participates in teacher-student interaction mostly focus on retrieving relevant materials, answering questions and doubts, and providing inspiration sources when responding to teachers' questions, so students answer more professionally and comprehensively to a certain extent

Combined with the above scenarios of ChatGPT's participation in teacher-student interaction, it is still difficult for ChatGPT to waver the original teacher-student interaction relationship as an independent subject. According to Respondent Teacher B, ChatGPT currently makes little impact on teacher-student communication so has not played a fundamental role in changing the interaction between teachers and students. Nonetheless, the interviewee Teacher A believes that in the future application, the participation of ChatGPT will bring fundamental changes to teacher-student interaction. From the past dual structure, the formation of a 'teacher-student-machine' ternary structure breaks the direct interaction in the past and introduces the 'human-computer interaction' collaboration model, which brings opportunities and challenges to the development of teacher-student interaction.

3.2.   ChatGPT Creates Opportunities for Teacher-Student Interaction

ChatGPT bridges the intergenerational differences between teachers and students to promote the equalization of teacher-student interaction. ChatGPT can learn and adapt. It will not retain the characteristics of the past era or the emerging era due to the changes of the times, and there are no intergeneration differences [6][7]. Therefore, interviewee Teacher B believes that ChatGPT as new generation intervention in teacher-student interaction will help to bridge the gap in intergenerational thinking between teachers and students, provide real-time learning resources for teachers and students, and help to build a bridge of equal dialogue between teachers and students, thus changing the original teacher-to-student knowledge transfer to the two sides of the exchange of knowledge into a discussion, to achieve the teaching-learning transaction promote the equality of teacher-student interaction.

ChatGPT provides high-quality resources in real-time to promote the efficiency of teacher-student interaction. The powerful algorithm database of ChatGPT provides a large number of interdisciplinary and multi-domain information resources with high standards and effectiveness, allowing a large amount of data to be analyzed, integrated, and refined to further promote human-machine research collaboration. Nevertheless, interviewees Teacher B and Student B believe that when ChatGPT is used more maturely in teacher-student interaction in the future, the efficiency of teacher-student communication will be improved. In solving pure knowledge problems, students can obtain the necessary explanations in time and reduce the burden on teachers to a certain extent. Even

in the face of expansion problems, students can also gain ideas and inspiration from it, broaden their horizons for teacher-student communication, dig deeper, and promote the efficiency of teacher-student interaction.

ChatGPT meets the needs of customized information exchange to promote the personalization of teacher-student interaction. Compared with traditional AI, ChatGPT has the ability of natural language processing, which can realize multi-task processing, and provide the best solution to the current problem by combining the contexts and different prompts [7][8]. As a result, Student B pointed out that in teacher-student interactions, teaching concepts and learning objectives can be actively transmitted to ChatGPT to improve the cue word project to achieve specific problem analysis, stimulate learning interest, increase the motivation of inquiry, and promote the personalization of teacher-student interactions.

3.3. ChatGPT Brings the Challenges in Teacher-Student Interaction

ChatGPT participation increases the complexity of teacher-student interaction and weakens the emotional connection between teachers and students. With the wide application of ChatGPT and its gradual integration with education, the teacher-student interaction has changed from direct to indirect, transforming into a ternary interaction structure of "teacher-student-machine". According to the results of the interviews, the interviewees all agreed that compared with the traditional, the absolute knowledge authority of the teacher will be significantly weakened, and the boundary of its relationship with ChatGPT will become blurred, and if there is a contradiction in confirming the knowledge, it will lead to the problem of subject selection, which will put forward a higher demand on the teacher's professionalism and ethical qualities. So, after ChatGPT intervenes in teacher-student interaction, how to balance the relationship between the three subjects will become an important issue in maintaining a good emotional connection between teachers and students.

The use of ChatGPT leads to academic misconduct and aggravates the distrust between teachers and students. Multi-domain empirical research shows that the answers generated by ChatGPT for problems in various fields meet or even exceed the standard level, and can pass the qualification test in various fields. Therefore, the interviewees all agreed that the cases of academic misconduct caused by ChatGPT technology occur frequently. However, the academic detection system is imperfect at present, so it is still difficult for teachers to identify the situation in which students rely on ChatGPT to finish academic tasks, so it is inevitable to question it. Meanwhile, students' recognition of teachers' authority and their participation of ChatGPT began to waver, which exacerbated the sense of distrust between teachers and students [9].

ChatGPT participation helps to blur the effectiveness of teaching and learning and makes it difficult to achieve benign teacher-student interaction. Compared with compulsory education, the management mechanism in university education is more relaxed. As Student Zhang said, many college students use ChatGPT technology to complete academic tasks to meet the academic requirements put forward by the teachers and the school, which results in the fact that they have not absorbed the teaching content. Likewise, the teachers are unable to understand the real learning outcomes of the students, making it difficult to realize individualized teaching, and even presenting the occasion of cast pearls before swine, blurring the effectiveness of the teaching and making it hard to realize the positive teacher-student interaction.

4. Discussion

4.1. Challenges Towards Future Changes in Teacher-Student Interaction

The original teacher-student education presents a simple linear relationship, while the teacher-student relationship after the ChatGPT intervention has a duality that can have both positive and negative

effects. On the one hand, it is rich and convenient, providing a lot of convenience for teachers and students. Therefore, it is expected that it can become the third subject of the interaction between teachers and students, inject new vitality into the educational process, become a new factor in changing the teaching mode, and a link between teachers and students [10]. On the other hand, whether ChatGPT will increase the complexity of teacher-student communication, bring about the problem of distrust between teachers and students, and hinder the direct connection between teachers and students. How to measure the boundary after intervention and how to balance the three subjects are the risks that need to be faced in the future and the problems that need to be solved.

4.2. Solutions to the Challenges Faced

From the perspective of human beings, it needs to emphasize the consciousness of 'ethics first' Both technology developers and users should be aware of technical risks, advocate critical thinking and self-reflection, and formulate guidelines for the use and application of tools such as ChatGPT to clarify ethical boundaries. At the same time, strengthen the cultivation of the concept of ethics, ensure that students, teachers, and managers have basic ethical literacy, and reasonably use ChatGPT in learning and teaching. For example, critical thinking and ethical elements can be incorporated into the teaching content to help users develop the skills and habits needed to use ChatGPT normatively [11].

On the other hand, it is necessary to establish an effective evaluation mechanism and reshape academic integrity. By clearly defining the boundary of ChatGPT, encouraging students' academic originality, improving the teaching mode, and following up the learning process in time, it can effectively reduce the distrust of teacher-student interaction and provide reference and support for teaching improvement and personalized teaching.

At last, as far as the teacher-student interaction itself is concerned, the two subjects need to adjust their attitude toward artificial intelligence and regard ChatGPT as an auxiliary tool, which can be used benignly without separating the teacher-student interaction. Secondly, improve the efficiency and quality of teacher-student interaction, increase face-to-face instant communication, and get positive feedback. In the teacher-student interaction, it is necessary to optimize whether ChatGPT is involved or not. Based on better teacher-student interaction, it may be better for us to meet this special era.

4.3. Expectations for Future Applications

So far, ChatGPT shows a relatively positive trend. Although it still has many limitations, its core competence has begun to have a direct impact and enlightenment on education. On January 9, 2023, the OpenAI Lab carried out the latest round of improvements to the ChatGPT model, which enabled ChatGPT to respond to a wider range of topics and improved the authenticity of the answers [12]. Under the premise that technology becomes more advanced, how to use judgment and define it is the most important problem to be solved. The core of education is people, and technology is only a tool. Only by clarifying the relationship between people and tools can teachers better utilize the efficacy of technology in education and promote the development of education. Thus, the future of the university teacher-student interaction application of this segment will be more expected that it can directly act on the communication itself: for example, in the classroom, the teacher can be applied to the ChatGPT to directly interact with the students; or through the setup of AI teaching assistants with good interaction capabilities, provide real-time machine feedback or even human-machine debate environment and encourage students to carry out co-creative learning with the machine teaching assistants, to develop the Students' higher-order thinking ability and independent learning ability, etc.

[13]. It should be used as an "intelligent" assistant to help students and teachers conduct better information exchange and deeper communication and research.

Now there are a lot of artificial intelligence and educators to carry out some cooperation, but it is used in a fragmented way, only acting on a single subject. In the future application of artificial intelligence will not only be limited to unilateral interaction but can directly act on both sides, as a connection between the two sides of the interactive relationship, so that they both experience this new era of technology under the charm of this special era.

5. Conclusion

The impact of ChatGPT's involvement on the teacher-student relationship should be focused more on the challenges it faces than on the benefits it gives, so both teachers and students need to find a better balance to deal with the triadic teacher-student relationship. This paper bridges the research gap of previous studies focusing on the impact of ChatGPT on the teacher-student interaction relationship, providing a reference for the future formal introduction of ChatGPT into education and intervening in teacher-student interaction practice. In the future, the observational method will be adopted to carry out the study to further demonstrate and refine the impact of ChatGPT on teacher-student interaction, to turn the challenge into an opportunity to explore the practical use of ChatGPT in teacher-student interaction. But at present, the participation of ChatGPT in the process of direct teacher-student interaction is relatively fragmented, with fewer practical applications, a lack of reference materials that directly contribute to teacher-student interaction, and fewer documents to draw on.

Authors Contribution

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

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