Article

Practical research on the acceptance of ChatGPT by college students majoring in education in the background of generative artificial intelligence

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Abstract: In order to promote the application of class ChatGPT generative AI in education in the context of high-quality development of education, it is necessary to understand the acceptance of undergraduates majoring in education. Using literature method, questionnaire survey, difference analysis and reliability test, this paper concludes that education undergraduates have overall acceptance of ChatGPT generated artificial intelligence; performance expectation, effort expectation, perceived interest and social influence have positive influence on acceptance behavior intention, perceived risk has negative influence, the influence degree is from strong to performance expectation, social influence, effort expectation, perceived interest and perceived risk; different genders and grades show different differences in acceptance factors, while professional category has no significant influence.

Keywords: Students majoring in education; generative artificial intelligence; acceptance of ChatGPT

1. Introduction

Since the 18th National Congress of the Communist Party of China, General Secretary Xi Jinping attaches great importance to the construction of teachers. The training of high-quality teachers involves multi-dimensional and complex relations, which is both macro strategy and micro practice. Compared with the traditional educational auxiliary technology, the new era artificial intelligence technology represented by ChatGPT has achieved a leap in the order of parameters, and has made significant progress in adaptability, content generation ability, generalization ability, transfer learning ability and other aspects. The pre-service training system for teachers is an important support for high-quality teacher education, aiming to establish a comprehensive and diversified high-quality teacher training chain and support chain. Compared with the traditional educational auxiliary technology, the new era artificial intelligence technology represented by ChatGPT has achieved a leap in the order of parameters, and has made significant progress in adaptability, content generation ability, generalization ability, transfer learning ability and other aspects. This enables it to show a higher performance level and a wider application potential in the educational field. Artificial intelligence is a strategic technology leading the future. The rapid development of artificial intelligence will profoundly change the human social life and change the world. Under the influence of the trend of digital transformation of education in the world, the education and training of teachers should adopt a variety of strategies to improve the digital competence of teachers, provide solid talent support for the digital transformation of education, and then lay a foundation for children's all-round development and future success.ChatGPT (Chat Generative Pre-trained Transfo-rmer) generative artificial intelligence brings great opportunities and changes to production and life, education and scientific research, but it is also accompanied by moral ethics, information leakage and other problem risks. In the future era of educational development, we should make better use of artificial intelligence (AI) to improve the quality and efficiency of education, promote personalized learning, cultivate innovative talents with intelligent thinking, and apply AI to education, which is conducive to the transformation and upgrading of education. The research on AI and integrated education in China started early, but it lacks in-depth understanding and accurate exploration, and lacks the research from the perspective of education. With

the help of artificial intelligence technology, it can provide resources, environment and data support for the modern teacher education system, promote the modernization of teachers with the modernization of the teacher education system, and support the modernization of education. For such products, some people prohibit, some people accept. Undergraduate students majoring in education in school are the preparatory force of kindergarten teachers, which directly affects the high-quality development of education in China, and then affects the development of children. Its attitude and acceptance of emerging technologies directly affect the development and application of technologies.Represented by machine learning, cloud computing, natural language processing, etc.Artificial intelligence technology has brought about changes in social productivity and social forms The transformation has profoundly impacted the

economy, culture, education and other fields, and has brought great changes to

traditional learning.It has had a huge impact on school education and the teaching profession. Therefore, it is of great significance to understand the acceptance of ChatGPT and class generated AI in education. This paper constructs the acceptance model of education undergraduates, and understands the acceptance situation and influencing factors of class ChatGPT-generated artificial intelligence in education undergraduates through questionnaire survey, so as to provide more effective training and support for the training of high-quality teachers.

2. Methodology

(1) Survey design

Referring to the Venkatesh Maturity Scale and the research results of Xiong Mingzhu, Wang Yubiao and others [7-8], a questionnaire was compiled based on the characteristics of college students. The questionnaire was divided into two parts. The first part is basic information, including gender, grade, major category, understanding and use of generative artificial intelligence, etc. The second part is a survey of factors affecting acceptance, including performance expectations, effort expectations, social influence, perceived risk, perceived interest and behavioral intention, using a five-point Likert scale, with 1-5 representing "strongly disagree" and "strongly disagree" respectively. "Disagree", "Normally", "Agree", "Strongly Agree".

(2) Literature data method

through consulting, analysis and sorting of relevant literature data, to obtain the required information and data, to provide theoretical support and empirical basis for the research. Through the library, academic database, the Internet to find relevant literature, and using the method of induction, summary, comparison of literature processing, form their own research ideas and ideas, will eventually read and analyze the literature after sorting and utilization, form their own research framework and demonstration basis.

The questionnaire survey method, referring to the Venkatesh mature scale, and the research results of Xiong Mingzhu and Wang Yubiao, was combined with the characteristics of undergraduate students majoring in education. The questionnaire was divided into two parts. The first part is the basic information, including gender, grade, professional category, the understanding and use of generative artificial intelligence, etc. The second part is the investigation of factors affecting acceptance, including performance expectation, expectation of effort, social impact, perceived risk, perceived interest and behavioral intention. Using Likert level 5 score, 1-5 represent "very disagree", "disagree", "general", "agree" and "very agree" respectively. A total of questionnaires were distributed online for two weeks. 207 questionnaires were collected, and 5 invalid questionnaires (answering time was less than 30s) were removed. 202 valid questionnaires were recovered, and the effective rate was about 98%.For the reliability and validity test, the Cronbach's coefficient of each dimension of the questionnaire was greater than 0.7, and the overall Cronbach's coefficient of the questionnaire was 0.888, indicating that the questionnaire had good reliability. The questionnaire KMO was obtained by KMO, with a coefficient of 0.901 (> 0.7), p=0.000 (<0.05), indicating that the questionnaire had good validity and was very suitable for factor analysis.

(3) Research models and study hypotheses

The Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. consists of two outcome variables: behavioral intention (BI) and usage behavior (Behavior, B), and performance expectation (PE).), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC), as well as four moderator

variables of gender, age, experience and voluntariness . Research has found that this model can explain up to 70% of users' technology acceptance, which is significantly higher than other theoretical models , so it is widely used in technology adoption and use research.

Table 1

The research hypothesis that educational college students accept ChatGPT from the perspective of generative artificial intelligence

serial number	Suppose the content
H1	Performance expectations (PE) have a positive impact on behavioral intentions of generative artificial intelligence
H2	Effort expectation (EE) has a positive impact on behavioral intention of generative artificial intelligence
H3	Social influence (SI) has a positive impact on behavioral intentions of generative artificial intelligence
H4	Perceived risk (PR) has a negative impact on behavioral intentions of generative artificial intelligence
H5	Perceived fun (PP) has a positive impact on the behavioral intention of generative artificial intelligence
H6	There are significant differences in each variable among different genders, different grades, and different major categories.

3. Results

The training of high-quality teachers involves multi-dimensional and complex relationship, which is both macro strategy and micro practice. The integration of artificial intelligence technology into the pre-service training system for teachers is an important support for high-quality teacher education, aiming to establish a comprehensive and diversified high-quality teacher training chain and support chain. The demographic results of the examined objects are shown in Table 1.

Table 1

Demographic statistical results

name	option	frequency	percentage
sexual distinction	boy	92	48%
	girl	110	52%
year level	Undergraduate grade one	23	10.6%
	Second grade undergraduate	40	21.2%
	Undergraduate grade three	50	26.8%
	Undergraduate fourth grade	37	15.2%

Difference analysis: Difference analysis of gender in each variable, as shown in Table 2. Independent sample t-test was used to indicate significant gender differences in behavioral intention (BI). The male mean was 4.082, the female mean was 3.931, the t value was 1.998, and the p value was 0.048, which was less than 0.05, indicating that the intention of use was significantly different from women.

Table 2

Test of differences in gender on the variables

variable	boy（N=92）	girl （N=110）	t	p
PE	3.740±0.669	3.764±0.588	-0.262	0.794
EE	3.818±0.643	3.767±0.603	0.571	0.569
SI	4.095±0.622	4.071±0.54	0.285	0.776
PP	3.835±0.621	3.770±0.633	0.727	0.468

PR	3.800±0.470	3.786±0.546	0.187	0.852
BI	4.082±0.598	3.931±0.546	1.997	0.048

Differential analysis of professional categories on various variables, as shown in Table 3. Using independent sample t-test, we concluded that science and technology students had slightly higher performance expectations and perceived interest, but overall there was no significant difference among different major categories (p> 0.05).

Table 3

Differential tests of professional categories for each variable

	science and engineering（N=93）	Literature and history class（N=105）	t	p
PE	3.777±0.535	3.732±0.697	0.497	0.620
EE	3.780±0.565	3.801±0.668	-0.230	0.819
SI	4.004±0.534	4.150±0.610	- 1.776	0.077
PP	3.806±0.519	3.798±0.707	0.096	0.924
PR	3.769±0.494	3.813±0.524	-0.602	0.548
BI	4.000±0.531	4.012±0.614	-0.151	0.880

Differential analysis of grade on each variable, as shown in Table 4. One-way ANOVA revealed significant differences in performance expectation (p=0.028), effort expectation (p=0.000), social impact (p=0.022), perceived interest (p=0.002), and behavioral intention (p=0.000), and no significant differences in perceived interest (p=0.684> 0.05). Through multiple comparisons after LSD, it is found that with the increase of grade, the expectation of effort and behavior intention are gradually strengthened; the performance expectation is highest; the degree is changed from strong to weak, fourth, fourth, first and second. In conclusion, the part H6 hypothesis holds.

Table 4

Mean ± standard deviation and univariate ANOVA analysis on grade

grade	PE	EE	SI	PP	PR	BI
Undergraduate grade one	3.683±0.833	3.556±0.686	3.952±0.805	3.524±0.779	3.8±0.442	3.794±0.726
Second grade undergraduate	3.675±0.614	3.635±0.588	3.944±0.555	3.730±0.567	3.706±0.516	3.849±0.590
Undergraduate grade three	3.585±0.613	3.654±0.627	3.994±0.575	3.654±0.623	3.855±0.496	3.887±0.570
Undergraduate fourth grade	3.967±0.506	3.933±0.603	4.200±0.571	3.922±0.598	3.822±0.417	4.156±0.493
F	2.786	5.556	2.944	4.554	0.571	5.482
p	0.027	0.000	0.022	0.002	0.684	0.000

4. Discussion

Based on the breakthrough progress of ChatGPT in the field of general intelligence, the ability to assist and support teacher education in multiple links will be continuously improved. In 2019, the Ministry of Education of China issued the Professional Standards for Kindergarten Teachers (Trial) " (hereinafter referred to as the Professional Standards Accurate), for the training of high quality teachers in the new era of the standards, but also become the main basis for training teachers. In the professional The standard emphasizes that teachers should have the concept of children first, the spirit of ethics first, professional knowledge and practical ability, and the end The awareness of physical learning. Among them, professional practical ability is one

of the necessary core qualities of teachers. There are 14 Professional Standards There are 7 related parts of professional practice ability in the field, including the ability to plan and implement educational activities, and support and guide game activities Dynamic ability, communication and cooperation ability, motivation and evaluation ability, daily life organization and conservation ability, environment creation and The ability to use and the ability to reflect and develop. The most core and important standard to measure the quality of teachers' education and training is the practical effect of training. High-quality teacher education and training should enable teachers to make them feel the practicality and effectiveness of educational training, meet their teaching practice needs and promote their professional development. And artificial intelligence technology can help us build a big data platform for teachers. ChatGPT At present, there are mainly the following three problems: First, the generation of wrong information is uncontrollable. Since ChatGPT is trained based on a large amount of data, it may generate wrong information or answers, which may mislead students or teachers, thus affecting their learning effect. The second is that there is a bias in the data training. If there is a bias in the data itself, then the model will also be affected by this bias, leading to unfair or discriminatory results. Third, ChatGPT needs to collect and process a large amount of students' privacy data, such as dialogue records, historical scores, academic evaluation, etc., which will involve privacy issues. If these data are abused or leaked, it will cause adverse effects. In the teaching activities of the era of artificial intelligence, there are certain risks of algorithm as the underlying building. For example, the universality of algorithm will cause the shallow level of education, the "black box" effect will cause the "recessive control" of education, the algorithm bias will cause the unfairness of education, and the large-scale use of algorithm will cause the homogeneity of education.

5. Conclusion

Undergraduate majoring in education are in a state of acceptance of ChatGPT generated artificial intelligence. Performance expectations, efforts to expect four variables for education undergraduate generative artificial intelligence behavior intention has significant positive influence, perceived risk has significant negative, influence, influence degree from strong to weak in turn for performance expectations, social shadow, ring, expectations, perceived interest, perceived risk, the assumption

that H1, H2, H3, H4, H5. Gender and grade showed significant differences among different factors of acceptance, with no significant differences in the effects of specialty categories. The main manifestations are: men's behavior intention of generative AI is significantly higher than women; effort expectation and behavior intention gradually increase with the increase of students' grade; fourth-year undergraduate students have the highest performance expectation of generative AI; and postgraduate students have the highest influence on social influence and perceived interest. Suppose that part H6 holds true. To improve individual acceptance of generative AI, efforts are needed to improve performance expectations, social impact, effort expectations, and perceived interest. Expand application scenarios to meet more needs, and comprehensively improve the expected price efficiency of users; extensively publicize generative AI and expand its influence; integrate generative AI into education and teaching, and enhance students' interest in learning; optimize platform design and improve ease of use. In addition, the state should formulate and improve relevant laws and regulations, draw a red line and mark the bottom line for the development and application of generative artificial intelligence, to prevent its harm to , strengthen the network information security barrier, and reduce the risk of information leakage.

The development of artificial intelligence is oriented by the promotion of human development. Its application in the field of education is an inevitable trend, in the future, there will be diversified, dual-track, open, mixed, process and diversified changes . With the wide application of artificial intelligence technology, we face challenges in data processing, privacy protection, information rights and interests. It is very important to establish a scientific and just ethical framework to ensure the fairness of education and safeguard the principal status of teachers and students and information security. In terms of educational data processing, attention should be paid to the whole life cycle of the data to ensure its scientific nature, objectivity and authenticity. Fully respect and protect personal privacy to prevent data leakage, abuse and illegal acquisition. In terms of information rights and interests, fairness and transparency of information should be advocated. Ensure that all types of learners have equal access to and use of educational resources, promote the equitable distribution of resources, and narrow the educational gap. In the application of artificial intelligence, we should emphasize people-oriented, pay attention to the interaction between teachers and students, respect individual differences, and give play to the auxiliary role of

artificial intelligence, rather than completely replacing the dominant position of people. In terms of ensuring information security, relevant systems should be improved to provide clear guidance and norms for the application of AI in education and prevent algorithmic risks. By optimizing algorithm design, improving algorithm transparency, reducing bias, and establishing accountability mechanisms. In short, scientific data collection and use, information fairness and security, and the coordination and interaction between people and technology are the prerequisite for artificial intelligence to change the educational ecology. Only by serving education and being people-oriented can AI realize the modernization of education. Building a scientific and just ethical framework is of great significance to realize the educational fairness in the era of artificial intelligence and to guarantee the subject status and safety of teachers and students. The cooperation and exchanges should be strengthened at all levels, jointly discuss the ethical issues of AI in the field of education, and make unremitting efforts to build a fair, safe and orderly ecological environment for AI education make great efforts. Finally, it will realize the organic integration of artificial intelligence and education and teaching, meet the requirements of high-quality teachers in the new era, provide a strong talent guarantee for the digital transformation of education, and lay a solid foundation for children's all-round development and future success.

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