

Research on the cultivation and improvement of college students' question ability and innovation and entrepreneurship ability under the background of ChatGPT

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Abstract: *Question is the beginning of thinking, but also the beginning of learning. Question ability is the basis of the cultivation of innovation ability, and question ability is of great significance to the cultivation of college students' innovation ability. ChatGPT has powerful human-computer interaction capabilities and text generation abilities, providing new opportunities for innovation and entrepreneurship education in colleges and universities. This study aims to improve the innovation and entrepreneurship ability of college students by cultivating their question ability and with the assistance of ChatGPT.*

Keywords: *ChatGPT; College students; Question ability; Innovation and entrepreneurship ability*

1. Introduction

Youth is the future of the motherland. Colleges and universities shoulder the responsibility and mission of "educating people for the Party and for the country", so they must pay attention to the cultivation of young students' innovative ability.^[1] Einstein once said: "Raising a problem is often more important than solving a problem, because solving a problem may only be a mathematical or experimental technique. However, raising new questions and new possibilities, and looking at the old ones from a new perspective, requires an innovative imagination, which marks the real progress of science."^[2] Therefore, colleges and universities should pay attention to the cultivation of students' ability to ask questions in order to cultivate their innovation and entrepreneurship ability. ChatGPT(Chat Generative Pre-trained Transformer) is a chatbot model released by the American OpenAI company in 2022. It has powerful human-computer interaction functions. The model can carry out dialogues by understanding and learning human language.^[3] At present, ChatGPT has been upgraded to GPT-4 version, and its powerful functions and artificial intelligence features provide new opportunities for innovation and entrepreneurship education in universities.

2. The application prospect of ChatGPT in innovation and entrepreneurship education in universities

GPT series models adopt different research paradigms and improvement points, but all of them improve the model performance through pre-training and fine tuning. The original GPT model used a combination of unsupervised pre-training and supervised fine-tuning, while GPT-2.0 improves results by increasing the amount of training data and the size of the model. GPT-3.0 uses a combination of unsupervised pre-training and prompt engineering, and only needs to provide a few examples to complete all supervision tasks. GPT-3.5 is an upgraded version of GPT-3.0 that improves the model through evaluation and optimization updates. Based on GPT-3.5, ChatGPT introduces reinforcement learning and strategy optimization algorithm for fine tuning, so that users can get better experience when interacting with ChatGPT.^[4] The development of the GPT technology is shown in Figure 1.^[5]

| Research paradigm | Unsupervised training + Supervised fine tuning | | Unsupervised training + Engineering tips | | | |
|--------------------|---|-----------------------|--|------------------------------|---------------------------------|---------|
| | Semi-supervised learning unsupervised learning | Unsupervised learning | Cue learning | Cue Learning Reward model | Learning with Human Feedback | unknown |
| Training technique | | | | | | |
| Parameter quantity | 117 million | 1.542 billion | 7.6 billion | 13 billion | 175 billion | unknown |
| Model name | GPT | GPT-2.0 | GPT-3.0 | GPT-3.5 | ChatGPT | GPT-4.0 |
| The year | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |

Figure 1: The development of GPT technology

ChatGPT plays an important role in innovation and entrepreneurship education in colleges and universities. ChatGPT as an intelligent assistant, it can provide students with real-time questions and guidance, through the interaction with ChatGPT, students can gain knowledge and experience on innovation and entrepreneurship, explore new innovative directions and business opportunities, stimulate students' innovative thinking and entrepreneurial awareness, and improve their ability and literacy. In addition, ChatGPT can provide personalized learning and guidance based on the needs and interests of students to help students improve their learning effectiveness and motivation.

3. The importance of training students' question ability for innovation and entrepreneurship education in colleges and universities

It is more important to ask questions than to solve them. It is very important to cultivate students' question ability for innovation and entrepreneurship education in colleges and universities. Question ability is not only a necessary core ability for students to learn and grow, but also a key link for colleges and universities to cultivate innovative and entrepreneurial talents. First of all, the ability to ask questions can stimulate students' innovative thinking. By asking questions, students can think deeply about the nature, causes and solutions of problems, thus cultivating their innovative thinking ability. This way of thinking can help students to look at problems from different angles, break the shackles of traditional thinking, and stimulate the production of innovative thinking. Secondly, the ability to ask questions helps students find innovative opportunities. By actively asking questions, students can have a deep understanding of market demand, industry trends and social issues, and thus find potential innovation opportunities, which is very important for cultivating students' innovation and entrepreneurship ability, because innovation and entrepreneurship require students to have the ability to find and seize opportunities. In addition, the ability to ask questions can also help students solve difficult problems in the process of innovation. By asking questions, students can analyze problems, find solutions, and constantly adjust and improve in the practice of innovation, which is very key to cultivating students' problem-solving ability and innovation ability. At the same time, the ability to ask questions also promotes teamwork. By asking questions, students can have in-depth discussions and exchanges with team members and jointly explore solutions to problems, which is very important for cultivating students' teamwork ability and innovative collaboration ability. By cultivating students' question ability, colleges and universities can better train innovative and entrepreneurial talents and promote the development of innovative and entrepreneurial education.

4. Cultivation and improvement path of college students' question ability

From the perspectives of students, teachers and universities, the author puts forward some suggestions on how to improve students' question ability.

4.1 Perspective of student

4.1.1 Cultivate interest in learning

Interest is the best teacher. College students improve their ability to ask questions by cultivating their interest in learning. Developing interest in learning can stimulate students' enthusiasm for learning. When students are passionate about a certain subject or field, they will be more proactive in learning and willing to spend more time and energy to explore deeply. They actively read relevant books, articles and research papers to gain more knowledge and information. In the process, they will continue

to ask questions and answer them through further study and research. Developing interest in study can help students broaden their horizons. When students are interested in a topic, they often take the initiative to understand the relevant background knowledge and development process. By gaining in-depth knowledge of a field, students can better understand the concepts and principles within it and ask more in-depth questions. At the same time, they can also think about problems from different angles and ask more in-depth questions through exchanges and discussions with other students, teachers and experts. Cultivating interest in learning can also promote the development of students' critical thinking skills. When students are interested in a certain topic, they will often not be satisfied with superficial knowledge, but will actively think about the problems and contradictions in it. They will question and challenge the questions of existing opinions and seek answers through research and analysis. This development of critical thinking skills can help students ask questions with greater depth and breadth, and be able to better understand and apply what they have learned.

4.1.2 Establish a correct view of learning

College students can improve their question ability by setting up correct learning view. College students should have a positive attitude towards their studies. They should understand that studying is to improve their ability and quality, not to cope with exams. Only by actively investing in learning can we really master knowledge and improve our learning ability. At the same time, college students should pay attention to knowledge acquisition and understanding. They should actively read relevant books, articles and materials, actively participate in class discussions and interactions, and communicate and discuss with teachers and classmates. Through continuous learning and thinking, college students broaden their horizons and increase their understanding and mastery of knowledge.

4.1.3 Develop the habit of asking questions actively

College students should also get into the habit of asking questions. Students should not be afraid to ask questions and not be afraid to make mistakes or ask questions that others think are stupid. Questioning is a very important part of the learning process, through which you can find and solve problems and deepen the understanding of knowledge. College students can cultivate their question ability by actively asking questions in class, participating in discussion groups, and asking teachers for advice.

4.1.4 Make good use of learning tools

"A gentleman is not born different, but is good at using external things". College students should also learn how to solve problems. When you encounter problems in learning, you should not easily give up, but you should be good at looking for lessons and inspiration from things, and find ways and methods to solve problems. College students can solve problems by consulting information, consulting others, conducting experiments, etc., and can also use AI tools such as ChatGPT, Wenxinyiyan, and Spark Cognition Grand Model to get answers. The ability to solve problems can not only help college students master knowledge better, but also cultivate their innovative thinking.

4.2 Perspective of teacher

4.2.1 Create a good atmosphere for asking questions

Teachers cultivate students' question ability by creating a good atmosphere for questioning. Teachers should create a classroom atmosphere that encourages questioning and tolerates mistakes, so that students feel comfortable, stimulate their thinking vitality, and encourage them to take the initiative to ask questions. When students raise questions, teachers should listen patiently and provide appropriate answers and guidance. Teachers can explore multiple perspectives of problems with students, help them deeply understand the nature of problems, and cultivate their comprehensive analysis and critical thinking skills. At the same time, teachers should give students full encouragement and affirmation. When students put forward in-depth and innovative questions, teachers should praise and affirm their efforts and thinking in time, enhance students' self-confidence and enthusiasm, and further stimulate students' desire and motivation to ask questions. Teachers should attach importance to and actively create a good atmosphere for questioning, stimulate students' curiosity and thirst for knowledge, and promote the development of students' learning and thinking ability.

4.2.2 Teach questioning skills

Teachers can cultivate students' question ability by teaching them questioning skills. Teachers can teach students to ask open questions and encourage deep thinking and exploration. Teachers can use

cases to help students better understand how to ask questions. At the same time, students are instructed on how to organize and express their questions effectively, how to break them down into smaller parts, and how to use appropriate language and vocabulary to express their meaning precisely. By teaching questioning skills, it promotes the development of students' learning and thinking skills, while stimulating the development of innovative and critical thinking in students.

4.3 Perspective of university

4.3.1 Strengthen the construction of teachers

Colleges and universities can improve students' question ability by strengthening the construction of teachers. Colleges and universities can improve teachers' teaching ability by organizing special training, establishing communication platform and establishing evaluation mechanism. Through special training and the establishment of exchange platforms, the exchange and cooperation among teachers are promoted, so that teachers can master teaching methods and skills, improve teaching quality, and stimulate students' thinking and question ability. Establish an evaluation mechanism to assess teachers' teaching ability, force teachers to improve their teaching level and professional quality with the system, and let teachers pay attention to the cultivation of students' question ability.

4.3.2 Provide critical thinking courses

Colleges and universities can offer courses on critical thinking to improve students' question ability. This course covers an overview of critical thinking, questioning techniques and strategies, information evaluation and verification, critical reading and writing, logical reasoning and argumentation, and innovative thinking and problem solving. Through such courses, students can systematically learn how to ask high-quality questions, assess and verify the accuracy of information, read and write critically, reason logically and argue, and apply critical thinking to problem solving and drive innovation.

5. Cultivation and promotion path of college students' innovation and entrepreneurship ability

5.1 Offer courses on innovation and entrepreneurship

Offering innovation and entrepreneurship education courses in colleges and universities can help students understand the basic concepts and methods of innovation and entrepreneurship, and cultivate their innovative thinking and entrepreneurial consciousness. Innovation and entrepreneurship courses include innovative thinking, business model design, marketing, entrepreneurial management and other aspects of the content, students can systematically understand the relevant knowledge of innovation and entrepreneurship. At the same time, through the course of innovation and entrepreneurship, students can learn about different business models. Teachers conduct market analysis and competition analysis on students through cases to help students understand the market and choose suitable business models according to their own advantages. In addition, students can also improve their management skills through innovation and entrepreneurship courses, which provide strong support for students' future development and career development.

5.2 Build an innovation and entrepreneurship practice platform

Colleges and universities should build innovation and entrepreneurship practice platforms, provide necessary resource support for students and teachers participating in innovation and entrepreneurship competitions, and provide places for college students' entrepreneurship teams by setting up innovation and entrepreneurship incubation parks, providing training and guidance for college students in innovation and entrepreneurship, and improving their innovative thinking and entrepreneurial ability. We will strengthen cooperation between schools and enterprises, promote the combination of production, learning, research and application, increase the transformation of scientific research results in colleges and universities, and improve the level of scientific research and entrepreneurship of teachers. Provide policy support, establish innovation and entrepreneurship funds for college students, and motivate college students to participate in innovation and entrepreneurship activities.

5.3 Optimize the incentive mechanism of innovation and entrepreneurship competition

Universities can stimulate the enthusiasm of teachers and students to participate in innovation and entrepreneurship competitions by optimizing the incentive mechanism of innovation and

entrepreneurship competitions. Colleges and universities can encourage teachers and students to participate in innovation and entrepreneurship competitions by setting up bonuses, honorary titles and other measures. According to the level of participation in innovation and entrepreneurship competitions and awards, the instructor of the project will be reflected in the year-end performance and professional title evaluation, and the college students of the participating project will be reflected in the evaluation of excellence and research retention, so that the participating teachers and students can feel recognized and rewarded. Thus more actively participate in innovation and entrepreneurship competition.

6. Conclusion

ChatGPT Enabling innovation and entrepreneurship education in colleges and universities, ChatGPT provides students with a broader space for innovation. By cultivating college students' questioning ability, colleges and universities can enable students to accurately express the key points and needs of questions, and obtain answers more accurately when using ChatGPT. Students can have a deeper understanding of market needs, industry trends and social problems, so as to find potential innovation opportunities. At the same time, students were also able to assess the accuracy and reliability of ChatGPT's responses, exploring further by asking in-depth questions. This not only improves students' information acquisition and problem solving ability, but also brings new opportunities for university innovation and entrepreneurship education. With the empowerment of ChatGPT, the innovation and entrepreneurship education in colleges and universities can improve the innovative thinking and practical ability of college students by cultivating students' questioning ability, which can better cultivate innovative and entrepreneurial talents and promote the further development of innovation and entrepreneurship education.

Acknowledgements

The authors would like to thank the financial supports from the Xinjiang University of Political Science and Law President Fund Project: Research on Innovation and Entrepreneurship Ability Improvement of College Students in Xinjiang under the background of "Internet +", Project No.:XZSK2022049.

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