

Research on Application of Artificial Intelligence Teaching Mode Based on Project-based Learning

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Abstract: AI learning emphasizes learning based on real projects. The projects that students need to do must be real, complete, meaningful, and can be completed in a short time. It helps students comprehensively apply various knowledge and skills in the process of exploration and practice, and improve the core quality of AI. This study made a preliminary exploration of the AI teaching mode based on project-based learning. Combined with teaching practice, it summarized the basic links of AI teaching based on project-based learning: based on the situation, ingenious project design, brainstorming, creativity generation, role assignment, each role, activity exploration, engineering design, iterative iteration, product optimization, achievement sharing, and ability improvement. Through these six main links to carry out teaching activities, the artificial intelligence teaching model based on project-based learning has achieved good teaching results.

Keywords: Project-based learning, Artificial intelligence teaching mode, Network learning space.

1. Project-based Learning and Industrial Intelligence Education

"Project-based Learning" (PBL), also known as "project-based learning" and "project-based learning", is a typical multi-learning mode guided by constructivism theory. Project-based learning was initially defined by the curriculum standard of Barker Institute of Education in the United States: "A set of systematic teaching methods, which is a process of exploring complex and real problems, and also a process of designing project works carefully, planning and implementing project tasks. In this process, students can master the required knowledge and skills." American scholar Dr. Thomas believes that "the first characteristic of project-based learning is centripetal, that is, the project is the center of the curriculum".

Artificial intelligence is regarded as a landmark technology that influenced the fourth industrial revolution and educational revolution, and the importance of artificial intelligence in basic education has also become a social consensus. With the promulgation of the New Generation Artificial Intelligence Development Plan and the vigorous development of artificial intelligence in our country, artificial intelligence courses in primary and secondary schools have sprung up.

The feasibility of intelligence education is according to students' psychological characteristics, cognitive characteristics and daily learning and living habits, the design of the project needs to be ingenious, with a real situation, emphasizing "a comprehensive description of one or a series of learning events or activities".

2. Implementation Steps of Artificial Intelligence Teaching Based on Project-based Learning

The project-based AI teaching effectively stimulates students' interest in learning and desire to explore, and exercises their practical exploration and innovation ability. Next, I will take the typical project based AI content as an

example to analyze its specific implementation steps.

2.1. Set up projects according to the situation.

If you want to encourage students to have good creativity, you must carefully design topics. The topic must be selected with typical significance and can mobilize the enthusiasm of most students. For example, when I talked about the relevant chapters of "Fundamentals of Artificial Intelligence Programming", I actively introduced Mixly software from Beijing Normal University as the software for students to program. The software is a graphical interface, allowing students to have a new experience, and can connect and interact with various sensors. After the students are familiar with the software and hardware of artificial intelligence development, I will give them a research topic: designing a vehicle mounted device that can optimize the urban traffic experience.

2.2. Brainstorm and generate creativity.

Artificial intelligence education is one of the important ways to cultivate students' innovative spirit. Through innovation, students can generate good product creativity. Good creativity generally comes from students' meticulous observation of real life, observation of existing things and insight into their working principles, and then transfer this principle to new things or objects to complete a creativity. So how to train students to capture instant inspiration and generate good ideas? Professor Huang Ronghuai of Beijing Normal University believes that through design practice, learners can be trained in divergent thinking, convergent thinking, image thinking, intuitive thinking, etc. to a certain extent, so as to promote the development of innovative thinking. I guide students to carry out preliminary training of creativity through divergent and convergent methods.

2.3. Activity exploration and engineering design

Once you have a good idea, you should further realize it and make it with artificial intelligence technology. If the creative stage is still a concept, the design stage needs to make

product models. Students first find the corresponding sensors on the Mixly software, and then connect and program them. When connecting, pay attention to the combination with various structures of the program, such as, sequence structure, branch structure and cycle structure. The applicable conditions of each structure must be set. For example, if you find that the small light is flashing all the time and cannot stop, you may fall into an endless loop by mistake.

2.4. Activity exploration and engineering design

Once you have a good idea, you should further realize it and make it with artificial intelligence technology. As if the creative stage is still a concept, the design stage will produce product models. First of all, students find the corresponding sensor on the Mixly software to connect and program. When connecting pay attention to the combination with various structures of the program, such as sequence structure, branch structure and loop structure the applicable conditions of these structures must be set. For example, sometimes I find that the small light is flashing all the time, and I can't if you stop, you may slip into an endless loop.

2.5. Repeated iteration and product optimization

After each component is manufactured, the assembly integration test will be carried out, and some existing problems of the product may be found during the test. For example, the Arduino motherboard was successfully placed in the 3D printing housing, but forgot to punch a wire hole, and the fully enclosed housing could not extend the sensor wiring. What should I do? See if time is enough. Change the inappropriate part in 3D modeling and print again after comprehensive correction. Later, after all the shells were perfect and assembled, I suddenly found that the motherboard was not lit. After troubleshooting, it was found that the wiring was not secure, so it would be better to plug it firmly again. Finally, through everyone's unremitting efforts, artificial intelligence products have finally been successfully produced.

3. Project based AI learning to improve students' AI literacy

When setting the theme of AI projects, I try to find the life oriented and real task scenarios to do project research projects, which will help students find inspiration and creativity close to life in the process of completing the projects. Through the production of real projects, students can feel the fun of

success, discovery and experience, and change the single and boring way of learning. The students actively communicate and report, which helps them to cultivate team spirit and cooperation spirit, and participate in AI production and communication as masters and designers.

The project-based artificial intelligence teaching has greatly cultivated the students' practical ability and ability to solve practical problems, and used these abilities and methods to solve the difficulties and problems encountered in learning and life. At the same time, students can also be trained to "top-down, gradually refine" project thinking, and divide a grand goal into several small tasks, and then complete them one by one. This kind of ability to do things in a planned and step-by-step way will certainly help them in their practical ability and engineering thinking, and will also lay a good foundation for their innovative practice activities in the future.

4. Conclusion

In a word, the AI teaching mode based on project-based learning can greatly promote students' AI literacy.

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