

## Research on Intelligent Terminal Development in the Era of Artificial Intelligence

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### Abstract

**This paper analyzes the reform of higher education curriculum under the background of Artificial Intelligence (AI), aiming at the relevant courses of communication engineering major in applied universities. The course "Intelligent Terminal Development" is set up to meet the development and application of intelligent terminals in the era of AI. In this paper, the teaching design of the course is firstly based on the analysis of the needs of the era of AI and the current students' situation. Then, the teaching methods of theoretical teaching in the classrooms and experiment teaching in the laboratories are reformed, respectively. In theoretical teaching, task-driven teaching method is adopted to stimulate students' learning interest and guide students to study independently. In experimental teaching, project teaching method is adopted to apply theoretical knowledge to practical project development and improve teamwork ability.**

### Keywords

**Artificial Intelligence, Intelligent terminal development, Task-driven teaching method, Project teaching method.**

### 1. Introduction

With the rapid development of science and technology, Artificial Intelligence (AI) technology has had a profound impact on the field of education. AI covers a wide range of subjects, including mathematical theory, automation, biology, linguistics and other disciplines, which can provide new teaching modes and methods for higher education, but also put forward new requirements for talent training. In April 2018, the Ministry of Education issued the AI Innovation Action Plan for Colleges and Universities to guide colleges and universities to build a talent training system in the field of AI, providing strategic support for the development of China's new generation of AI

Specifically, the development of AI is closely related to higher education. On the one hand, the development of AI needs higher education to deliver research and application talents. On the other hand, AI technology has a great impact on the content and methods of higher education. Therefore, two perspectives are formed to examine AI and higher education. One is from the perspective of AI, what higher education needs to do in order to meet the development of AI. And from the perspective of higher education, what benefits can the development of AI bring to university teaching? These are all worthy of college teachers thinking.

This paper analyzes the reform of higher education under the background of AI for communication engineering courses in application-oriented universities, and takes Intelligent Terminal Development as an example to discuss how to reform teaching design and teaching methods in specific cases, so as to provide a theoretical basis for subsequent course teaching.

### 2. The Relationship between AI and Intelligent Terminal Development

The author works in the university, which is positioned as an application-oriented undergraduate university, and AI technology has been widely applied in the field of communication. Therefore, the development of AI is both an opportunity and a challenge for application-oriented communication engineering. The teaching of communication engineering specialty should take the construction of

communication specialty under the background of AI as the breakthrough point, take the deep integration of AI technology and course teaching as the center, focus on the intelligent reform of teaching design and teaching methods, and cultivate compound and applied talents in the field of communication according to the needs of the development of AI.

This paper takes the curriculum as the research object. The development of intelligent terminal of the course is a professional elective course of applied communication engineering specialty. The Android operating system as the development platform, with smart phones, smart dressing equipment, intelligent terminal equipment such as TV and driverless cars as the carrier, design and programming implementation meet demand of the APP. The course Intelligent Terminal Development is set up to meet the development and application of intelligent terminals in the era of AI. Its teaching content and teaching methods are closely related to AI technology. On the one hand, the main learning content of the course Intelligent Terminal Development includes APP development in mobile Internet, which is the main application of AI in life and work. Therefore, in addition to the basic knowledge in books, new contents of AI should be added to theoretical and experimental courses. On the other hand, AI provides Intelligent Terminal Development with new teaching methods and teaching ideas, which can carry out intelligent reform and innovation of teaching design and teaching methods. This paper aims to integrate AI thought and technology into curriculum teaching, improve students' actual APP development ability through the reform of teaching design, teaching content and teaching methods, so as to strengthen students' employment competitiveness and provide qualified talents for the development of communication and AI.

### 3. Teaching Design on Intelligent Terminal Development

Good and effective teaching classes are designed. Teaching design is a very important first step in teaching activities, which can foreseeably determine teaching objectives, teaching content, teaching methods and teaching processes. Teaching design needs to systematically design and arrange teaching activities from teaching objectives, teaching subject and object, teaching content, teaching media, teaching environment and teaching evaluation. Under the background of AI, the elements of teaching activities have new changes and new demands. This paper will focus on the reform of teaching design of Intelligent Terminal Development from two aspects of teaching subject and object and teaching content.

The premise of teaching design is to clarify the subject and object of teaching. The traditional teaching subject and object is called the two-body theory, and the core includes the students and the teachers. The addition of AI technology makes the two-body theory turn to the three-body theory with students, teachers and AI as the core. Teaching activities not only consider students and teachers, but also highlight the role of AI technology.

Specifically, AI technology can serve as a teacher's right-hand man, undertaking the tasks of decision support, answering questions and correcting homework, and greatly improving the efficiency and effect of teaching. On the one hand, many voice and image recognition, wearable devices, virtual reality and other technologies can assist classroom teaching. On the other hand, deep learning and data mining algorithms can evaluate and feedback students' learning. For example, at the beginning of a class, to assess the learning content of the last class, we can use the method assisted by wechat small program to let students scan the two-dimensional code to answer questions, and the program automatically analyzes the accuracy, and then review the knowledge points that students do not master well. To clarify a point, AI can only assist teachers, but can not replace the position of teachers, because AI can only do some simple and repeated analysis and summary, while teachers should play the advantages of human innovation, complex decision-making and emotional care. Education under the background of AI is a process of cooperation between human beings and AI, but the tasks undertaken by teachers in teaching activities have changed. "Design and guidance" has been added to the traditional "teaching and clarifying", that is, to design learning activities, promote learning process and help solve students' problems.

For students, AI can serve as an intelligent tutor, recording and analyzing the learning process and characteristics of each student in real time, and can also serve as a learning assistant, distributing personalized learning content according to the characteristics of students. For example, students can use intelligent software to sort out and summarize wrong questions, and only need to consolidate wrong questions when reviewing. In addition, intelligent software can also act as a learning assistant for students, helping them to plan their learning tasks and arrange their time effectively, and promoting their learning through friendly cooperation with students.

In terms of teaching content, it is necessary to combine theoretical knowledge with AI scenarios and introduce artificial intelligence-related technologies according to the background of The Times to stimulate students' learning interest. For example, in the introduction of the course Intelligent Terminal Development, in addition to introducing the development history of intelligent terminal equipment in the book, the development history of AI technology is added, and the mutual promotion relationship between the two is explained. Take the functions of smart phones as an example. With the help of AI technology, smart phones have facial recognition, intelligent dimming and other technologies, which improve online payment and photo taking and enhance user experience.

In addition, common algorithms of AI can also be added. For example, Deep Learning is an efficient feature extraction method, which can extract more abstract features from data to achieve more essential characterization of data. At present, face recognition technology based on Deep Learning is increasingly popular in mobile payment, authentication, password protection and other aspects, and has become a new focus in the field of intelligent terminal application. Therefore, when explaining the relevant modules and codes of face recognition in the course, the principle and application of Deep Learning can be appropriately added, and the method of face recognition based on Deep Learning can be realized simply by collecting face image features, using Deep Learning algorithm to recognize face features, and training deep neural network algorithm. And explain how to use Android programming language to write and implement a simple face recognition program based on Deep Learning.

#### **4. Teaching Methods on Intelligent Terminal Development**

In the teaching process, a variety of teaching methods can be used comprehensively according to the teaching content in order to obtain better classroom teaching effect. Under the background of AI, students can preview and review through multimedia channels. Teachers can also use intelligent terminals to communicate with students more and guide students to study independently more efficiently. Therefore, in the context of AI, there are a variety of novel teaching methods, including task-driven teaching method, interactive teaching method, case teaching method and project teaching method. This paper takes task-driven teaching method and project-based teaching method as examples to analyze the teaching methods of intelligent Terminal Development.

##### **4.1 Theoretical Teaching**

First of all, in the theoretical class, task-driven teaching method can be used to guide students to prepare and review independently. To be specific, teachers can assign preview content to students before class, and students can consult materials independently by reading books, surfing the Internet and other methods. After class, teachers sort out key knowledge points and let students review and think independently based on the main line of knowledge. This method can cultivate students' ability of independent study and independent thinking. For example, in the course "GPS positioning in Android", before class, students are required to search for the information of GPS positioning system in advance to understand several major GPS systems in the world, especially to learn the principles and advantages of China's independently developed Beidou positioning system, and students are required to preview the permission registration code of positioning function. After class, students are required to review and summarize the principles of GPS, location-based services, location-based technology, and the implementation codes of location-based functions.

## 4.2 Experiment Teaching

Secondly, the experimental content of Intelligent Terminal Development is composed of a simple APP project, which is very suitable for project-driven teaching method. Taking the "music player" APP development experiment as an example, 3~5 students were divided into a group. Students could assign roles independently and design the APP's personalized interface and functions according to their own preferences, completing the whole development process from requirement analysis, function integration, interface and database design, code writing and debugging, and online testing. Finally, students in the group are required to demonstrate and report the complete music player system to the teacher and other students, and exchange experience. In this way, students can experience the development and design process of a real project, comprehensively use the programming knowledge they have learned, cultivate teamwork ability, and lay a foundation for future work practice.

## 5. Conclusion

To sum up, in the context of the current development of AI, application-oriented communication engineering teaching should be combined with AI technology and ideas to reform and innovate teaching design and teaching methods. In the aspect of teaching design, this paper focuses on the change of the theory of teaching subject and object. The traditional two-body theory (teacher and student) is transformed into the three-body theory assisted by AI, focusing on the development of the auxiliary role of AI. Furthermore, AI should be added in addition to book knowledge. In terms of teaching methods, this paper discusses task-driven teaching method and project-driven teaching method, to improve students' ability of independent learning and independent thinking, experience the whole process of APP development, and gain design and development experience of practical projects while strengthening basic programming theories.

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