Application of ADDIE Model in Financial Engineering Practice Teaching under the Background of Artificial Intelligence

Enlin Tang*

School of Finance and Mathematics, Huainan Normal University, Huainan, 232038, China

Abstract

The development of artificial intelligence in the financial field has put forward higher requirements for the knowledge and skills of financial industry practitioners, and has also brought new challenges to the practical teaching of financial engineering major in application-oriented universities. Based on the background that AI is gradually infiltrating into the financial field, this paper points out the problems existing in the practical teaching of financial engineering major in application-oriented colleges and universities, further introduces ADDIE model into the practical teaching of financial engineering major, and puts forward the financial engineering practical teaching model based on ADDIE model, specifically including spiral rising model, tutorial model, simulation operation model, and comprehensive exercise model, At the same time, it puts forward the guarantee conditions of this practical teaching mode.

Keywords

Artificial Intelligence(AI); Financial Engineering; ADDIE Model; Practical Teaching

1. Introduction

Artificial intelligence includes the innovation of intelligent financial products and services, the establishment of financial development big data system, the development of risk intelligent early warning system, etc. In addition, it also includes the efficient and accurate handling of financial issues with the help of scientific and technological tools, such as financial asset pricing, financial quantitative trading, etc. [1]. With the gradual penetration of AI in the financial field, traditional financial tools and means are gradually lagging behind in solving financial problems, especially in solving modern financial problems that are developing towards technology and engineering. Artificial intelligence puts forward higher requirements for the quality and skills of financial talents. First, they need talents who have rich basic financial theoretical knowledge and interdisciplinary knowledge, as well as proficient in diversified practical skills; Secondly, they have a strong sense of innovation and innovation ability, including innovation in the form of financial services, innovation in financial investment technologies and methods, and design of financial derivatives; Finally, it is required to have the ability to use computers to deal with empirical and practical problems, and have strong information application ability [2]. To sum up, in the context of AI, the traditional teaching mode can no longer meet the requirements of the development trend of AI. In the traditional practical teaching, most application-oriented colleges and universities neglect the cultivation of students' intelligent financial ideas, practical ability and innovation ability. Therefore, it is of great significance to build a practical teaching mode that meets the new requirements of the financial industry in the context of AI.

2. The Current Situation of Practical Teaching of Financial Engineering Major in Application-Oriented Universities under the Background of Artificial Intelligence

2.1. Unclear Practical Teaching Objectives

At present, financial institutions such as banks are the first choice for employment of financial engineering graduates of application-oriented colleges and universities. However, in the context of artificial intelligence, the growth rate of commercial banks' personnel in recent years has basically shown a negative growth [3], and the scale of campus recruitment is also shrinking. Graduates who are lucky enough to enter financial institutions such as banks can only work in counter accounting posts and grass-roots marketing posts, and the level of work is not high, the reason for the dislocation with the shortage of financial talents in the financial industry is that the training orientation of financial talents in application-oriented universities is not clear. Especially in the current AI background, the modern financial industry is becoming increasingly intelligent, technical and engineering, and the requirements for financial talents are becoming higher and higher. Therefore, the training goal of financial talents should be to be proficient in quantitative trading, with derivatives design, asset pricing Skilled, innovative and compound financial talents with investment ability in risk control and financial field [4].

2.2. Imperfect Evaluation Mechanism of Practical Teaching Effect

Under the current employment pressure, many application-oriented colleges and universities pay more and more attention to the practical teaching links of financial engineering specialty and actively carry out multi-dimensional practical training to improve the practical operation skills and innovation ability of graduates, but the final results are often unsatisfactory. Many practical links lack effective guidance, management and even supervision, leading to students' formality in these links, For example, the choice of internship units is more casual, and some students even choose some small companies that have nothing to do with finance during the decentralized internship; In the training link, not every student does his best to practice; In terms of curriculum design and graduation design, they basically imitate or even copy each other according to the design framework. Although the design of practice link structure is relatively comprehensive, it is unknown how the effect of practice teaching is and how the students master it, so a scientific and effective evaluation mechanism needs to be established.

2.3. Lack of Innovation in the Form of Practical Teaching

In the context of artificial intelligence, although application-oriented colleges and universities are actively exploring a new mode of practical teaching, they have only changed the form on the surface, and there is not much change in nature, such as changing comprehensive design into curriculum design or academic year papers, but the content of students' design reports is not much different. The content of the school training is almost unchanged from year to year, and the environment of financial simulation training differs greatly from that of real financial institutions. In addition, the current practical teaching can only reflect some practical operations in the financial field, while investment banking practice, fund investment, insurance sales, etc. are almost not reflected in the practical teaching.

2.4. The Level of College AI Practice Teachers is Uneven

In the context of AI, some colleges and universities are seriously short of AI teachers. At the same time, teachers lack practical experience in AI. Even if college teachers can get the latest developments and information of AI development at the first time, they do not understand the specific situation of the internal AI talent demand of enterprises, and it is difficult to effectively carry out talent training. Artificial intelligence has put forward higher requirements for the ability and quality of practical teaching teachers. At present, the instructors of financial

engineering practical teaching in application-oriented colleges and universities are basically transferred from theoretical courses, teaching while learning. There is no solid foundation and rich experience, especially the lack of work experience in financial institutions and industry practice background. The application-oriented colleges and universities should increase the support for the introduction of financial professional teachers, and encourage the original theoretical teachers to participate in practical training and improve their innovation ability, so as to create double qualified talents.

3. Application of ADDIE Model in Practical Teaching of Financial Engineering

3.1. The Guidance of ADDIE Model to the Design of Financial Engineering Practice Teaching Link

The content of practical teaching of financial engineering specialty: experiment, training, practice and practice. The laboratory hardware architecture and teaching software system are the foundation, experiment and training are the core, and comprehensive practice and practice are the auxiliary.

The ADDIE model is one of the development models of education and teaching courses. It is a model that studies education and teaching from the whole process of analysis, design, development, implementation to evaluation (as shown in Figure 1). The model involves a wide range of knowledge fields, including learning theory, communication theory and other knowledge reserves. The ADDIE model mainly includes three aspects, namely, what to learn? How to learn? How to judge the learning effect that learners have achieved.
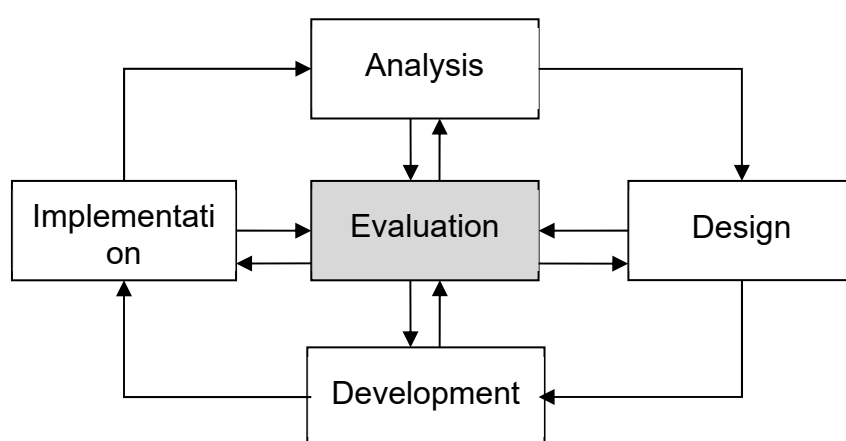

Figure 1. ADDIE Model Structure

The ADDIE model represents the core steps of teaching design. With teaching objectives and teaching problems as the first place, it analyzes and inspects learners' needs, designs learning or teaching strategies, develops and arranges teaching materials, implements teaching activities, and conducts summary and formative assessments. On the premise of clarifying the practical teaching objectives of financial engineering, we should design teaching strategies, further carry out the practical teaching process, and finally evaluate the teaching effect strictly and effectively according to the ability needs of financial engineering students.

3.2. Financial Engineering Practice Teaching Mode based on ADDIE Model

3.2.1. Spiral Rising Mode

The mode is mainly based on the process of "probation - understanding - understanding". Students can achieve the goal of spiral rise through step-by-step, gradual deepening and multiple cycles. The evaluation method is to write learning reports for each course and stage.

3.2.2. Tutorial Model

Due to the practical characteristics of this major, it is necessary to establish a one-to-one, one-to-several or several to one, several to several tutor teaching mode. The tutor with both theoretical knowledge and practical experience shall establish a corresponding relationship with the students. The relationship between the tutor and the students shall be dynamically managed according to the learning situation and the development interest of the students. The basic framework is (1, 2... N) → (1, 2... M). The evaluation method is that each tutor scores the students separately, and finally synthesize the scores of each tutor to get the final comprehensive score.

3.2.3. Simulation Operation Mode

At the request of the tutor, the students conduct directional imitation operations on certain aspects of the content, and finally become familiar with and master the skills in this part. The basic framework is: action orientation → imitation practice → independent practice → flexible transfer. The evaluation method is that the tutor makes a personalized evaluation of the students' mastery at each stage and the final transfer results.

3.2.4. Comprehensive Drill Mode

This is a higher form of training. Students can apply the knowledge they have learned to solve specific problems comprehensively and flexibly. The approaches are: first, laboratory simulation and computer realization; Second, practice outside the school, and improve in the actual position. The basic framework is: specific problems → plan formulation → problem solving → problem solving → (revised plan). The evaluation method is highly comprehensive, and the results can be divided into five levels of integral criteria, such as excellent, good, medium, pass and fail.

3.3. Guarantee Conditions of Financial Engineering Practice Teaching based on ADDIE Model

3.3.1. Establish an Effective Practical Teaching Evaluation System and Assessment Standards

Establish a practical teaching evaluation system and assessment standards that take process evaluation as the main body and combine with result evaluation. In the assessment, attention should be paid not only to the assessment of students' practical learning, but also to the assessment of teachers' practical teaching.

3.3.2. Strengthen the Construction of Practical Teaching Faculty

By arranging teachers to take a temporary job in the off-campus practice base, personally participate in the business operation process, participate in the transaction process, encourage teachers to actively carry out horizontal research projects, and finally cultivate a practical teaching team with solid theoretical knowledge and skilled practical skills.

3.3.3. Increase Investment and Improve the Quality of Corresponding Supporting Facilities (Including Hardware and Software)

Update the practice simulation software and system in a timely manner, so that the laboratory not only has the content of the simulation software for basic business of commercial banks, securities market analysis and trading, foreign exchange trading, futures and options trading, insurance business and other practical courses, but also can track the financial market and

transmit real-time financial data.

4. Conclusion

By analyzing the current situation of practical teaching in application-oriented colleges and universities, it is found that there are many problems in practical teaching of financial engineering major in application-oriented colleges and universities, including unclear practical teaching objectives, unsatisfactory practical teaching effects, lack of innovation in practical teaching forms, and the quality of teachers to be improved. The ADDIE model provides a theoretical basis for the "student-centered" classroom teaching mode. Through "analysis-design-development- implementation-evaluation", practical teaching is carried out, and then spiral rising mode, tutorial mode, simulation operation mode, and comprehensive exercise mode are derived, which will further improve students' learning interest and learning effect in practical teaching, so as to provide appropriate financial talents for the financial industry in the context of artificial intelligence.

Acknowledgments

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