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Review Article

Cultivating Postgraduates' Core Competitiveness in the aspects of Teaching Methods, Scientific Research Approaches, and Curriculum Setting in the Era of Artificial Intelligence

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Abstract

In the new era characterized by the rapid iteration of artificial intelligence (AI) technology and the continuous upgrading of industrial demands, postgraduates, as the core reserve force for national scientific and technological innovation, their core competitiveness is directly related to the implementation effect of a country's strategies of building a strong scientific and technological nation and a strong educational nation. Artificial intelligence technology has reshaped the underlying logic of knowledge production and application, putting forward new advancements for postgraduates' core competitiveness in terms of knowledge structure, scientific research ability, and innovative literacy. Despite these advancements, challenges remain, including issues of teaching mode, scientific research approach, and curriculum system surrounding AI- driven education. Based on the technical characteristics of the artificial intelligence era and the demand for high-level talents, the study systematically explores the constituent elements and cultivating paths of postgraduates' core competitiveness from three core dimensions: teaching mode innovation, scientific research approach reshaping, and curriculum system reconstruction in the framework of Artificial Intelligence.

Introduction

Research background and significance

At present, artificial intelligence technology has deeply penetrated various fields such as social economy, science and technology, culture, education, and scientific research, triggering a global scientific and technological revolution and industrial transformation, and profoundly changing the way of human production and life as well as the mode of knowledge production [1-4]. A report released by the McKinsey Global Institute shows that artificial intelligence technology can bring 2.6 to 4.4 trillion US dollars of economic growth to the global economy every year, and it is expected that between 2030 and 2060, it will gradually replace 50% of professional positions worldwide, while spawning a large number of new professional demands. In the field of scientific research, AlphaFold has accurately predicted the structure of 200 million proteins with artificial intelligence technology, which has completely subverted the research paradigm of traditional biological scientific research. This breakthrough also fully indicates that artificial intelligence has become the core driving force for promoting scientific and technological innovation, putting forward new challenges and requirements for the core capabilities of high-level talents [5].

As the top of the national education system, postgraduate education is in a core position for cultivating high-level innovative talents, carrying out high-level scientific research and serving national strategic needs, and undertakes the important strategic mission of talent incubation and scientific and technological innovation. According to the statistics released by the Ministry of Education, the number of postgraduates enrolled in China reached 1.357 million in 2024, and the

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number of postgraduates in schools exceeded 4.095 million, doubling compared with 2015. Postgraduate cultivation has fully shifted from the "scale expansion" stage to the "quality improvement" stage. In the era of artificial intelligence, postgraduates not only need to have solid professional basic knowledge and rigorous scientific thinking, but also need to master artificial intelligence-related technologies and tools, and possess strong scientific research and innovation ability, interdisciplinary collaboration ability, and lifelong learning ability. However, the current postgraduate training system in China still has many shortcomings: the teaching mode is rigid and single, mainly based on "lecture-based" teaching, lacking interactivity and practicality; the integration of scientific research training and artificial intelligence technology is insufficient, and postgraduates still use traditional scientific research methods, making it difficult to give full play to the enabling role of artificial intelligence in scientific research; the curriculum setting lags behind the development of the times, with a lack of artificial intelligence-related courses, insufficient proportion of interdisciplinary courses and practical courses, and disconnection between teaching, scientific research and curriculum setting, which are difficult to meet the cultivating needs of compound innovative talents in the era of artificial intelligence. In this context, systematically exploring the cultivating path of postgraduates' core competitiveness based on teaching, scientific research, and curriculum setting, and solving the prominent problems in the current cultivating process have become an urgent task for the reform of postgraduate education in colleges and universities, and also have important theoretical and practical significance [6-7].

At the theoretical level, based on the technical characteristics of the artificial intelligence era, this study clarifies the constituent elements of postgraduates' core competitiveness, constructs a "teaching-scientific research-curriculum" trinity cultivating framework, enriches the theoretical system of postgraduate education reform under the background of artificial intelligence, fills the research gap of lack of systematicity and integrity in current related research, and provides theoretical reference for subsequent related research. At the practical level, combined with the advanced practical cases of universities at home and abroad and the teaching reform achievements of related majors such as fermentation engineering, physical chemistry and pattern recognition, this paper puts forward targeted cultivating strategies, which can effectively solve the prominent problems in current postgraduate cultivating, such as rigid teaching mode, insufficient integration of scientific research and AI, and imperfect curriculum system, help postgraduates improve their comprehensive competitiveness, and provide solid talent support for constructing of a strong scientific and technological nation and a strong talent nation.

Research status

Overseas research on the cultivation of postgraduates' core competitiveness started earlier, forming a relatively mature cultivating mode and theoretical system. Top universities such as Stanford University and the Massachusetts Institute of Technology took the lead in incorporating artificial intelligence courses into the core cultivating system for postgraduates, implementing the "interdisciplinary integration + AI empowerment" training mode, adopting diversified teaching methods such as project-based, inquiry-based and case-based teaching, focusing on the cultivation of postgraduates' scientific research practice ability and innovation ability, building a complete interdisciplinary scientific research platform and practice base, allowing postgraduates to take courses across majors and carry out scientific research in cross-fields, and forming a cultivating system with both forward-looking and practicality. At the same time, overseas scholars pay attention to the in-depth integration of artificial intelligence technology with postgraduate scientific research and teaching, and have carried out a large number of empirical studies on the constituent elements and training paths of postgraduates' core competitiveness in the era of artificial intelligence, providing solid practical support for the reform of postgraduate training.

Domestically, with the rapid development of artificial intelligence technology and the deepening of postgraduate education reform, scholars have gradually focused on the cultivation of postgraduates' core competitiveness in the era of artificial intelligence and carried out a series of related research. Beijing Institute of Technology has implemented the "AI·DREAM" teaching reform, innovated the mixed teaching mode through interdisciplinary integration and artificial intelligence technology empowerment, built an interdisciplinary scientific research and innovation platform, reconstructed the diversified curriculum system, and created a smart paradigm for postgraduate education in the era of artificial intelligence [8]; Xi'an Jiaotong University has promoted the full-process integration of artificial intelligence and postgraduate cultivating, constructed a complete artificial intelligence curriculum model, carried out innovative practice training camps, systematically built artificial intelligence-related courses, cultivated postgraduates' AI application ability and scientific research innovation ability, and achieved remarkable results. At the professional teaching reform level, scholars such as He Tengxia have constructed a "one core, two integrations, three connections and four chains" talent training system for fermentation engineering, strengthening the in-depth integration of scientific research and engineering practice; scholars such as Zhang Yuyang have integrated scientific research achievements into the teaching process of physical chemistry, implementing a five-step teaching method of "scientific research introduction-theoretical explanation-experimental verification-innovative practice"; scholars such as Yi Zunhui have carried out case-driven teaching reform of pattern recognition courses [9]; scholars such as Jiang Xiangju have promoted the practice of scientific research feeding back teaching in sensor courses [10]; Scholars such as Ran Ruyi have designed scientific research innovation training courses on electrocatalytic hydrogen evolution, all of which have provided valuable practical experience for the cultivation of postgraduates' core competitiveness in the era of artificial intelligence. However, on the whole, there are still many deficiencies in domestic related research: most studies focus on a single dimension, lacking systematic research on the coordinated efforts of teaching, scientific research and

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curriculum setting; empirical research is relatively scarce, some studies lack practical case support, and the proposed training paths are not targeted and operable enough; there is insufficient research on the differentiated cultivation of postgraduates' core competitiveness in different disciplines and majors, which is difficult to meet the cultivating needs of various postgraduates.

Research methods and content

Combined with the research objectives and research content, this paper adopts a variety of research methods to ensure the scientificity, systematicity, and practicality of the research. First, the literature review research method: by consulting literature, academic papers, monographs and policy documents related to artificial intelligence, postgraduates' core competitiveness, postgraduate education reform, curriculum setting and other related fields at home and abroad, systematically sort out the relevant research results and research status, clarify the theoretical basis and research gaps of the research, and lay a solid theoretical foundation for the research of this paper. Second, the case analysis method: select representative universities at home and abroad (such as Stanford University, Massachusetts Institute of Technology, Beijing Institute of Technology, Xi'an Jiaotong University) and teaching reform cases of related majors such as fermentation engineering and physical chemistry, conduct in-depth analysis of their advanced experience and practical paths in the cultivation of postgraduates' core competitiveness, and provide practical reference for putting forward targeted cultivating strategies. Third, the inductive summary research method: sort out, analyze, and summarize the collected literature and case data, extract the constituent elements of postgraduates' core competitiveness, the prominent problems existing in the current cultivating process, and their core causes, and summarize the advanced cultivating experience of universities at home and abroad. Fourth, the comparative research method: compare and analyze the modes, paths, and effects of postgraduates' core competitiveness cultivation in universities at home and abroad, learn from foreign advanced experience, and put forward training strategies in line with China's national conditions, combined with the actual situation of postgraduate education in China [11].

The research content of this study mainly focuses on the following aspects: First, the introduction part elaborates on the research background, research significance, research status at home and abroad, research methods, and research content of this paper, and clarifies the research ideas and research framework of this paper. Second, the part of the definition of relevant concepts and theoretical basis: define the core concepts of artificial intelligence and postgraduates' core competitiveness, sort out relevant theories such as higher education theory, lifelong learning theory, innovative education theory, and interdisciplinary education theory, and provide theoretical support for the research of this paper. Third, the part of the analysis on the constituent elements of postgraduates' core competitiveness in the era of artificial intelligence: systematically analyzes the constituent elements of postgraduates' core competitiveness combined with the characteristics of the artificial intelligence era and talent needs, and clarifies the core connotation and interrelationship of each element. Fourth, the part of analysis on the current situation and problems of postgraduate cultivating in the era of artificial intelligence: analyze the prominent problems existing in China's current postgraduate training in terms of teaching mode, scientific research training, and curriculum setting, and explore the core causes of these problems. Fifth, the part of practical cases and experience reference of postgraduates' core competitiveness cultivation in universities at home and abroad: select representative universities and professional teaching reform cases at home and abroad, summarize their advanced experience, and provide reference for the cultivation of postgraduates' core competitiveness in China. Sixth, the part of strategies for cultivating postgraduates' core competitiveness based on teaching, scientific research, and curriculum setting in the era of artificial intelligence: combined with the previous analysis, put forward targeted cultivating strategies from three core dimensions: teaching mode innovation, scientific research approach reshaping, and curriculum system reconstruction. Seventh, the conclusion and prospect part: summarizes the research conclusions of this paper, analyzes the deficiencies in the research process, and looks forward to future related research.

Analysis of the constituent elements of postgraduates' core competitiveness in the era of artificial intelligence

Basic supporting elements

Basic supporting elements are the foundation of postgraduates' core competitiveness, mainly including professional ability and interdisciplinary collaboration ability, which together provide a basic guarantee for postgraduates' scientific research innovation and career development. Professional ability is the fundamental basis for postgraduates to establish themselves, and a prerequisite for postgraduates to carry out scientific research, master AI technology, and participate in interdisciplinary collaboration. In the era of artificial intelligence, professional ability is no longer a simple accumulation of professional knowledge and skills, but emphasizes "professional deepening + technology integration", that is, postgraduates not only need to have solid professional basic knowledge and proficient professional skills, but also need to master artificial intelligence technologies and tools related to their major, and be able to combine artificial intelligence technology with their professional scientific research and practical work. For example, science and engineering postgraduates need to carry out scientific research in fields such as fermentation engineering process optimization, sensor research and development, and electrocatalytic hydrogen evolution in combination with artificial intelligence technology; liberal arts postgraduates need to use artificial intelligence tools to carry out research work such as literature mining, data statistics, and text analysis, to improve research efficiency and quality. The cultivation of professional ability is also the basic goal of teaching reform in related majors such as fermentation

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engineering and physical chemistry, which consolidates the professional foundation of postgraduates through various methods such as curriculum teaching, experimental practice, and scientific research training.

Interdisciplinary collaboration ability is an important support for addressing complex problems, and also an important component of postgraduates' core competitiveness in the era of artificial intelligence. With the rapid development of artificial intelligence technology, the solution to various complex problems is no longer limited to a single discipline, but requires the integration and intersection of multi-disciplinary knowledge. For example, the research and development of artificial intelligence products requires the collaborative support of multi-disciplinary knowledge, such as computer science, mathematics, engineering, and sociology; the development of major scientific and technological projects requires postgraduates in different disciplinary fields to cooperate and complement each other's advantages. Therefore, postgraduates need to have strong interdisciplinary collaboration ability, be able to integrate multi-disciplinary knowledge, communicate and cooperate effectively with researchers in different disciplinary fields, and jointly solve complex scientific research and practical problems. The interdisciplinary reform implemented by Beijing Institute of Technology and the integration practice of fermentation engineering and artificial intelligence technology both provide effective support paths for the cultivation of postgraduates' interdisciplinary collaboration ability.

Sustainable guarantee elements

Sustainable guarantee elements are the long-term guarantee of postgraduates' core competitiveness, mainly including lifelong learning ability and professional literacy, which can ensure the sustainable development of postgraduates and help them adapt to the changes of the times and career needs. Lifelong learning ability is the key to adapting to technological iteration and knowledge update, and also the core guarantee for postgraduates' sustainable development. In the era of artificial intelligence, the cycle of knowledge update is greatly shortened, and the rapid development of artificial intelligence technology also makes various professional knowledge and skills iteratively upgraded. If postgraduates lack lifelong learning ability, they will find it difficult to adapt to the needs of the times and maintain their core competitiveness [12]. Therefore, postgraduates need to establish the concept of lifelong learning, have strong autonomous learning ability, learning planning ability, and information screening ability, be able to actively pay attention to the frontier trends of the discipline and the development trend of technology, continuously learn new knowledge and skills, and constantly improve their knowledge structure and ability system. The cultivation of lifelong learning ability is also a long-term goal of postgraduate education in colleges and universities, which guides postgraduates to develop the habit of autonomous learning and improve their lifelong learning ability through the innovation of teaching modes and the optimization of the curriculum system.

Professional literacy is an essential quality for postgraduates to become high-level talents, and also an important supplement to postgraduates' core competitiveness. In the era of artificial intelligence, postgraduates not only need to have strong professional ability, scientific research and innovation ability, and AI application ability, but also need to have good professional literacy, including professional ethics, scientific research integrity, sense of responsibility, and engineering ethics. Scientific research integrity is the basic criterion for postgraduates to carry out scientific research, and also an essential quality for high-level talents. In the era of artificial intelligence, postgraduates need to adhere to scientific research integrity and eliminate academic misconduct using artificial intelligence technology; engineering ethics is an important quality for postgraduates in applied majors. In the teaching reform of majors such as fermentation engineering and sensors, the cultivation of engineering ethics is emphasized, guiding postgraduates to establish a correct view of engineering ethics and balance technological innovation and social responsibility in scientific research and practical work. Good professional literacy can help postgraduates establish correct professional values, improve their comprehensive quality, and realize the coordinated development of individuals and society.

Analysis of the current situation and problems of postgraduate training in the era of artificial intelligence

Problems in the core links of cultivating

In terms of teaching mode, the current postgraduate teaching mode in China is still relatively rigid and single, which makes it difficult to meet the cultivation needs of the artificial intelligence era. In terms of scientific research cultivation, the core problem is the insufficient integration of scientific research cultivation and artificial intelligence technology, resulting in weak scientific research and innovation ability of postgraduates. In terms of curriculum setting, the system is imperfect, lacking systematicity and forward-looking, which makes it difficult to support the cultivation of postgraduates' core competitiveness.

Core causes of the problems

Backward educational concepts are one of the core causes of the current problems in postgraduate training. Some colleges and universities still use the traditional postgraduate education concepts, have not established the core concept of "AI + Education", have insufficient understanding of the connotation and needs of postgraduates' core competitiveness in the era of artificial intelligence, still take knowledge transmission as the core goal of postgraduate education, and ignore the cultivation of postgraduates' comprehensive abilities such as scientific research and innovation ability, AI application ability and interdisciplinary collaboration ability; at the same time, some colleges and universities do not pay enough attention to professional teaching reform, and fail to effectively integrate the achievements of teaching reform into the whole process of postgraduate training, making it difficult to achieve the

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coordinated development of teaching, scientific research and curriculum setting.

The lag in the construction of the faculty makes it difficult to meet the cultivation needs of the artificial intelligence era. On the one hand, some postgraduate tutors have insufficient artificial intelligence literacy, lack systematic training in artificial intelligence knowledge, are difficult to carry out scientific research using artificial intelligence technology, and cannot effectively guide postgraduates to carry out scientific research and learning using AI technology; on the other hand, some tutors have insufficient teaching and scientific research ability, lack the awareness and ability to innovate teaching modes and optimize curriculum content, and are difficult to meet the personalized and diversified training needs of postgraduates [13]. In addition, colleges and universities do not invest enough in the training of the faculty, and have not established a perfect AI literacy training system, making it difficult to effectively improve the comprehensive ability of tutors.

Insufficient resource investment provides insufficient support for postgraduate training. On the one hand, colleges and universities have insufficient investment in the construction of artificial intelligence teaching and scientific research platforms, lack perfect AI laboratories, virtual simulation platforms, interdisciplinary scientific research platforms, etc., which are difficult to meet the needs of postgraduates to carry out AI-related scientific research and practical work; on the other hand, the cooperation between colleges and universities and enterprises, scientific research institutions is not in-depth enough, and there is a lack of stable practice bases, making it difficult to provide postgraduates with real scientific research and practical scenarios, failing to effectively improve the practical ability of postgraduates. At the same time, the investment in postgraduate training funds is insufficient, which makes it difficult to support the development of AI-related curriculum construction, faculty training, scientific research training, and other work.

The single evaluation system is difficult to guide the improvement of postgraduates' core competitiveness. The current postgraduate cultivating evaluation system in China is still mainly based on quantitative evaluation, overemphasizing quantitative indicators such as the number of papers published and scientific research projects, while ignoring the qualitative evaluation of postgraduates' comprehensive ability, innovation potential and professional literacy [14]; at the same time, teaching evaluation, scientific research evaluation and curriculum evaluation are disconnected from each other, and no coordinated evaluation mechanism has been formed, which is difficult to comprehensively and objectively evaluate the cultivating quality and core competitiveness of postgraduates, and also difficult to guide colleges and universities to optimize the cultivating mode and improve the curriculum system.

Strategies for cultivating postgraduates' core competitiveness in terms of teaching methods, scientific research approaches, and curriculum setting in the era of artificial intelligence

Cultivating postgraduates' core competitiveness from three core dimensions: teaching mode innovation, scientific research approach reshaping, and curriculum system reconstruction in the framework of Artificial Intelligence, as shown in Figure 1.

Innovating teaching modes and creating a new smart teaching ecosystem

Innovating teaching modes is the key to improving postgraduates' core competitiveness. It is necessary to base on the characteristics of the artificial intelligence era and build an intelligent, interactive, and personalized new smart

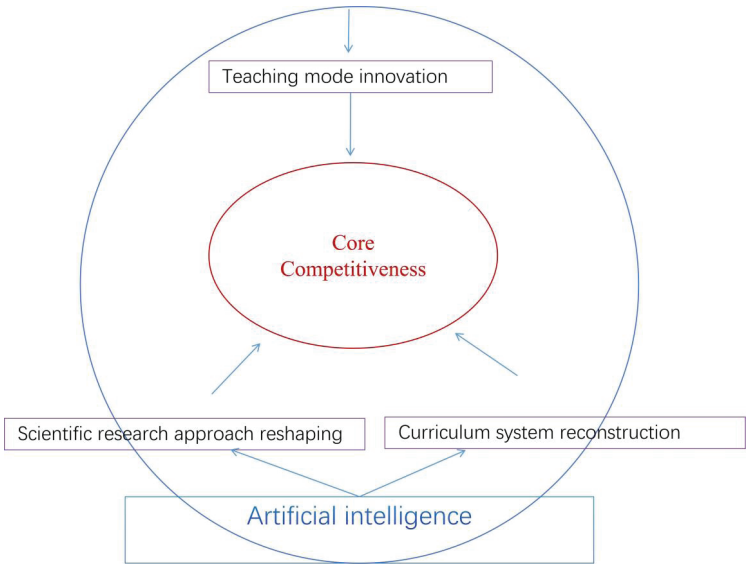

Figure 1: Cultivating Core Competitiveness in the aspect of teaching mode innovation, scientific research approach reshaping, and curriculum system reconstruction in the framework of Artificial Intelligence.

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teaching ecosystem. First, implement the mixed teaching mode of "online + offline" and "theory + practice", integrate the advantages of online intelligent teaching resources and offline interactive teaching, use intelligent teaching platforms online to carry out knowledge point explanation, resource push, online Q&A, etc., and carry out interactive links such as case analysis, group discussion and scientific research practice offline, to realize the coordinated improvement of theoretical knowledge and practical ability. Second, integrate artificial intelligence technology to build an intelligent teaching system, use intelligent teaching systems, big data analysis, and other technologies to accurately analyze postgraduates' learning situation, knowledge weaknesses, and learning needs, and realize personalized teaching resource push to meet the differentiated needs of postgraduates. Third, strengthen the feedback of scientific research to teaching, promote the in-depth integration of teaching and scientific research, integrate tutors' scientific research projects, frontier disciplinary achievements, and professional teaching reform achievements into curriculum teaching, guide postgraduates to participate in scientific research projects, and improve the practicality and pertinence of teaching. Fourth, strengthen interdisciplinary teaching, break down the barriers between disciplines, set up interdisciplinary teaching modules and interdisciplinary courses, organize postgraduates of different disciplines to carry out collaborative learning and collaborative scientific research, cultivate postgraduates' interdisciplinary thinking and interdisciplinary collaboration ability, and adapt to the development trend of interdisciplinary integration in the era of artificial intelligence.

Reshaping scientific research approaches and improving the scientific research training system

Reshaping scientific research approaches is the core of improving postgraduates' core competitiveness. It is necessary to build a human-machine collaborative and industry-education integrated scientific research training system, and strengthen the in-depth integration of artificial intelligence and scientific research training. First, strengthen artificial intelligence empowerment, improve postgraduates' human-machine collaborative scientific research ability, carry out AI scientific research tool training, guide postgraduates to proficiently master AI tools related to literature mining, data processing, experimental simulation, etc. integrate AI technology into the whole process of scientific research such as scientific research topic selection, literature analysis, experimental design, data processing and achievement transformation, and improve scientific research efficiency and innovation level; build artificial intelligence scientific research platforms and virtual simulation platforms to provide support for postgraduates to carry out AI-related scientific research work, encourage postgraduates to use AI technology to carry out cutting-edge scientific research exploration, and cultivate scientific research and innovation ability [15]. Second, optimize the scientific research topic selection mechanism, base on the frontier of the discipline, national strategic needs and industrial actual needs, establish a scientific research topic selection review mechanism, guide postgraduates to choose scientific research topics with innovation, practicality and forward-looking, avoid repeated theoretical research, and improve the transformation value of scientific research achievements; encourage postgraduates to choose topics across majors and fields, and cultivate interdisciplinary scientific research ability. Third, innovate the scientific research guidance mode, improve the collaborative guidance mode of "tutor + team + enterprise tutor", clarify the guidance responsibilities of tutors, strengthen the communication and exchange between tutors and postgraduates, and timely solve the problems encountered by postgraduates in the process of scientific research; strengthen the training of tutors' AI literacy, regularly organize tutors to participate in artificial intelligence-related training and academic exchange activities, and improve tutors' ability to carry out scientific research and guide postgraduates using AI technology; invite enterprise technicians and industry experts to serve as enterprise tutors, provide practical guidance for postgraduates, and promote the in-depth integration of scientific research and industrial needs. Fourth, improve the diversified scientific research evaluation system, break the single paper-oriented evaluation mode, establish a comprehensive evaluation system combining quantitative evaluation and qualitative evaluation, process evaluation and result evaluation, include scientific research and innovation ability, AI application ability, practical ability, achievement transformation ability and professional literacy into the evaluation indicators, focus on scientific research quality and innovation value, guide postgraduates to establish a correct scientific research orientation, and comprehensively improve their scientific research ability.

Reconstruct the curriculum system and strengthen the cultivation of comprehensive abilities

The curriculum system related to artificial intelligence is an important carrier for the cultivation of postgraduates' core competitiveness. It is necessary to reconstruct a forward-looking, interdisciplinary, and practical curriculum system to realize the coordinated development of teaching, scientific research, and curriculum setting in the framework of artificial intelligence [Table 1].

First, build a four-in-one curriculum system of "general education + core professional courses + interdisciplinary courses + practical courses", reasonably adjust the proportion of various courses, and consolidate postgraduates' comprehensive

Table 1: Cultivating Core competitiveness related to AI curriculum setting.

Course Category	Specific AI Course Name	Weight	Core Competitiveness
General Education	Data Structures and Algorithms	10%	Scientific literacy
Core Professional Courses	Machine Learning	25%	AI application ability
	Deep Learning	20%	
	Natural Language Processing	15%	
	Computer Vision	15%	
Interdisciplinary Courses	Molecular Simulation	10%	Interdisciplinary research ability
Practical Courses	Intelligent Robot	5%	Ability to solve practical problems
Total		100%	

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quality and professional foundation. As shown in Table 1, the weight of core professional courses is the highest (75%), followed by general education courses (10%), interdisciplinary courses (10%), and practical courses (5%). General education courses (represented by Data Structures and Algorithms, accounting for 10% of the total curriculum) focus on cultivating postgraduates' scientific literacy and lifelong learning ability. Core professional courses (including Machine Learning (25%), Deep Learning (20%), Natural Language Processing (15%), and Computer Vision (15%), totaling 75%) focus on the cultivation of professional basic knowledge and professional skills, integrate AI-related knowledge and scientific research achievements, and improve postgraduates' professional ability and AI application ability [16]. Interdisciplinary courses (represented by Molecular Simulation, accounting for 10%) aim to develop postgraduates' cross-disciplinary scientific research ability. Practical courses (represented by Intelligent Robot, accounting for 5%) are designed to strengthen postgraduates' ability to solve practical problems. Second, update the curriculum content, maintain the forward-looking and practicality of the curriculum, timely integrate artificial intelligence technology, frontier disciplinary trends, scientific research achievements, and professional teaching reform achievements into curriculum teaching, and eliminate backward and redundant curriculum content. Third, strengthen the construction of interdisciplinary courses and practical courses, add interdisciplinary core courses and elective courses, cover multiple disciplinary fields such as computer science, mathematics and engineering, and encourage postgraduates to take courses across majors; use virtual simulation platforms to carry out virtual experiments and virtual scientific research projects, make up for the shortage of offline practical resources, and improve the effect of practical teaching. Fourth, establish a dynamic curriculum update mechanism, regularly investigate the development trend of the discipline and the changes of industrial needs, and timely adjust the curriculum setting and curriculum content according to the training needs of postgraduates' core competitiveness, to provide solid curriculum support for the cultivation of postgraduates' core competitiveness.

The curriculum system is an important carrier for the cultivation of postgraduates' core competitiveness. It is necessary to reconstruct a forward-looking, interdisciplinary, and practical curriculum system to realize the coordinated development of teaching, scientific research, and curriculum setting. First, build a four-in-one curriculum system of "general education + core courses + interdisciplinary courses + practical courses", reasonably adjust the proportion of various courses, and consolidate postgraduates' comprehensive quality and professional foundation. General education courses focus on cultivating postgraduates' humanistic literacy, scientific literacy, and lifelong learning ability; core courses focus on the cultivation of professional basic knowledge and professional skills, integrating AI-related knowledge and scientific research achievements, and improving postgraduates' professional ability and AI application ability [16]. Second, update the curriculum content, maintain the forward-looking and practicality of the curriculum, timely integrate artificial intelligence technology, frontier disciplinary trends, scientific research achievements, and professional teaching reform achievements into curriculum teaching, and eliminate backward and redundant curriculum content. Third, strengthen the construction of interdisciplinary courses and practical courses, add interdisciplinary core courses and elective courses, cover multiple disciplinary fields such as computer science, mathematics and engineering, and encourage postgraduates to take courses across majors; use virtual simulation platforms to carry out virtual experiments and virtual scientific research projects, make up for the shortage of offline practical resources, and improve the effect of practical teaching. Fourth, establish a dynamic curriculum update mechanism, regularly investigate the development trend of the discipline and the changes of industrial needs, and timely adjust the curriculum setting and curriculum content according to the training needs of postgraduates' core competitiveness, to provide solid curriculum support for the cultivation of postgraduates' core competitiveness [17].

Conclusion

Based on the technical characteristics of the artificial intelligence era and the demand for high-level talents, this paper carries out systematic research on the cultivation of postgraduates' core competitiveness based on teaching, scientific research and curriculum setting, and draws the following conclusions: First, postgraduates' core competitiveness in the era of artificial intelligence is a diversified comprehensive ability system, which is composed of basic supporting elements, sustainable guarantee elements, etc. Each element is interrelated and mutually supportive, forming an organic whole of postgraduates' core competitiveness. Second, there are many prominent problems in the core links of current postgraduate training in China, such as a rigid teaching mode, insufficient integration of scientific research and AI, and an imperfect curriculum system. The root causes of these problems lie in backward educational concepts, lagging faculty construction, insufficient resource investment, and a single evaluation system. Third, the teaching reform practices of universities and related majors at home and abroad have accumulated rich experience, the core of which is to establish advanced educational concepts, innovate teaching modes, strengthen the integration of AI and scientific research, reconstruct the curriculum system, strengthen faculty construction, and improve the comprehensive evaluation system. These experiences provide important reference for the cultivation of postgraduates' core competitiveness in China. Fourth, the cultivation of postgraduates' core competitiveness in the era of artificial intelligence needs to focus on three core dimensions: innovating teaching modes, empowering scientific research training and reconstructing the curriculum system, strengthen the in-depth integration of artificial intelligence and postgraduate training, and promote the coordinated education of teaching, scientific research and curriculum setting, to effectively improve postgraduates' comprehensive competitiveness and meet the needs of national strategies and industrial development.

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