



Research on the Strategies of Improving the Competency of Educational Technology Postgraduates in the context of Digital Transformation

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Abstract. Digitalization has begun to permeate various aspects of our lives, and various industries and organizations are in the process of transitioning from traditional to digital. The impact of digital transformation on higher education is significant. It not only poses new challenges to the traditional training models for master's education but also sets new requirements for competence when transitioning to employment. To address this, an analysis was conducted on the master's education programs in educational technology at 18 universities in the central, eastern, western, and northeastern regions of China. The current competence factors for master's degrees in educational technology were extracted. Based on these competence factors, a competence model for master's degrees in educational technology was constructed. Corresponding strategies for enhancing competence were proposed, with the hope that they can serve as a reference for the training of master's students in educational technology and contribute to the development of more high-quality, multidisciplinary professionals in the field of educational technology for society.

Keywords: Master of Educational Technology, Talent training program, Competency

1 Introduction

Digital transformation is a global trend, covering all walks of life, is an important carrier and direction of educational transformation worldwide[1], in the face of new situation and new tasks, the CPC Central Committee attaches great importance to the development of higher education and how to realize the smooth transformation of the mode of personnel training in colleges and universities under the trend of digital development. In February 2019, the Central Committee of the Communist Party of China and the state council issued "China's Educational Modernization 2035", which pointed out that education reform in the information age should be accelerated and educational service formats innovated, the establishment of digital education resources co-construction and sharing mechanism. The transformation of educational digitalization is a

systematic and fundamental reform involving educational ecological elements. The digital transformation of education is a systematic and fundamental change involving all elements of the educational ecosystem[2]. The advantages of educational digital transformation have been widely recognized by professionals in the industry and have become an inevitable driving force[3]. As digital transformation deepens, higher education is undergoing profound changes. This not only involves the transformation of instructional technologies but also includes new expectations for the skills that students must be taught. These skills go beyond cognitive aspects and extend to previously overlooked technical, organizational, and project management skills. In the era of digital transformation, beyond the original competency, non-cognitive skills (sometimes referred to as digital skills) are becoming increasingly important for professional business managers. These skills can assist them in making better decisions, solving problems, and managing teams[4]. Due to digital transformation, the work environment has undergone changes[5]. People are paying more attention to their social and emotional aspects, as well as emotional intelligence in non-cognitive skills – the ability to understand, use, and control emotions. This happens to be crucial for management, maintaining customer relations, and decision-making. On the other hand, as technology advances towards more mechanized and digitized systems, these skills become increasingly important[6]. McMurtrey et al. studied the importance of knowledge, technical, and non-technical skills in emphasizing information technology in successful professional environments[7]. In order to support appropriate university courses in the coming years, he emphasized the critical non-technical skills in information technology businesses. Jackson's research indicates that while higher education institutions consider "knowledge" as a key competency, teachers prioritize interpersonal skills such as reliability, responsibility, and empathy, rather than purely technical skills[8]. Additionally, researchers have explored the positive impact of social and emotional skills on professional efficiency, emphasizing the importance of non-cognitive skills as educational objectives[9].

It can be observed that currently, both domestically and internationally, there is a relatively high level of research interest in the abilities that students should possess in the context of digital transformation. Based on this, our research collected the talent development plans for master's students in educational technology from 18 universities in China. We conducted an analysis of the existing plans for cultivating master's talents in educational technology and extracted the competence elements necessary for master's students in educational technology during the process of digital transformation. Corresponding strategies for enhancing the competence development of master's students in educational technology were proposed. We are currently in the transitional era of digital transformation, and this paper aims to provide reference points for the cultivation of master's students in the field of educational technology after the completion of digital transformation in the future.

2 Analysis of Educational Technology Master's program in the context of digital transformation

Educational technology is an emerging cross-discipline combining contemporary education science with information technology. Educational technology should adapt to the prospect of a new era of social transformation, technological progress, and educational changes, based on the practice of China's education information fertile soil, around the digital transformation of education and high-quality development of education reform and innovation and deep cultivation[10]. Our country's educational technology (audio-visual education) is from the late 1970s to start again, then mainly in the application of teaching media-based. In 1986, South China Normal University, Beijing Normal University, and East China Normal University were approved by the relevant universities to become the first batch of training institutions for master's degrees in audio-visual education in our country. With the development of audio-visual education, in 1990, the Beijing Normal University formally proposed the name and curriculum system of "Audio-visual education major", which can cover the connotation and extension of audio-visual education educational technology under the new situation, in 1993, the Ministry of Education promulgated the Catalogue of undergraduate majors in ordinary colleges and universities, and renamed the major of audio-visual education as the major of educational technology. Today, the educational technology has won a place in many disciplines for itself. According to the 2023 postgraduate enrollment plan published by the research recruitment website, there are more than 100 institutions of higher learning (excluding military educational technology and universities in Hong Kong, Macao and Taiwan, some of which are accredited with educational technology master's degrees but have not enrolled), so far, according to incomplete statistics, there are at least 68 universities in our country, including 44 educational technology universities with professional discipline code (078401) and 24 universities with professional discipline (040110) and educational technology universities, which have the right to grant educational technology master's degrees.

Most universities with educational technology master's qualification offer science courses, so this article focuses on science as a first-level discipline, professional discipline code for 078401 Educational Technology Professional Master's program to conduct research. The list includes universities in the central, western, eastern and north-eastern parts of our country that have educational technology master's degree educational technology and have a professional grade of B or higher.

Table 1. Extraction of training objectives and competencies of educational technology post-graduates from 4 universities

Training Colleges and universities	Training objectives (Excerpt)	Extraction of competence elements
Beijing Normal University	Love Education, full of dedication and good professional character; master the development of educational theory and discipline systematically; master the basic paradigm and methods	Information Literacy, critical spirit, innovative ability, professional quality, basic theoretical knowledge of educational

	<p>of educational research, with professional writing and academic communication ability; Professional skills in educational practice, international perspective and cross-cultural communication skills, good information literacy, critical spirit and innovative ability.</p>	<p>technology, professional practical ability, scientific research ability, dedication, teaching management ability, international perspective, writing ability, cross-cultural communication ability</p>
<p>Central China Normal University</p>	<p>We should strive to learn Marxism–Leninism, Maoism and Deng Xiaoping Theory, adhere to the party's basic line, love the motherland, abide by discipline and the law, and have good morals and be willing to serve the socialist modernization drive. On the educational technology side, a good grasp of the basic theory and systematic professional knowledge, familiar with the history, present situation and development trend of the study of the subject at home and abroad, and a good command of a foreign language. Ability to independently engage in scientific research and teaching in educational technology. Love the work of teachers, with a healthy physique and good psychological quality.</p>	<p>Ideological and political literacy, discipline and law, dedication, basic theoretical knowledge of educational technology, professional knowledge, foreign language ability, scientific research ability, teaching and management ability, physical and mental health</p>
<p>Southwest University</p>	<p>To master the knowledge of modern science and Technology and information technology closely related to educational practice and reform; to participate in educational informatization and educational modernization reform; To master a foreign language, to be able to read the professional foreign literature and materials; to be competent for teaching and research, media development and technology management in institutions of higher learning, scientific research institutions and functional departments.</p>	<p>Basic theoretical knowledge, professional knowledge, professional practical ability, scientific research ability, foreign language ability, teaching management ability of educational technology education</p>
<p>Northeast Normal University</p>	<p>To foster patriotism and collectivism, to have good moral character, a strong sense of enterprise and responsibility, to abide by discipline and the law, to be of good conduct, to be rigorous in style of study, and to be physically and mentally healthy, can aspire to serve the construction and development of the motherland; Knowledge of systematic educational technology theory, methodology, and the application of information technology to the teaching of the subject. With international vision, can dynamically track the professional field of domestic</p>	<p>Educational technology basic theoretical knowledge, professional knowledge, professional practical ability, teaching and management ability, professionalism, sense of responsibility, discipline and law, good conduct, rigorous style of study, physical and mental health, international perspective, scientific research ability, foreign language ability, writing ability, international academic communication ability</p>

and international research status and development trends; Ability to independently conduct relevant scientific research and practical applications within the discipline; 5. Master a foreign language, be able to read and understand foreign language materials, have a certain writing ability and the ability of international academic exchanges.

(Source: educational technology master's degree programs on university websites
Note: Due to space limitations, only 5 university programs are shown here)

In addition to the four universities shown in Table 1, this article also collected the Zhejiang Normal University, Shandong Normal University, Shanxi Teachers University, Chongqing Normal University, Nanning Normal University, China West Normal University, and other 14 universities of educational technology master's program to study. It can be found that the ability development of educational technology postgraduates in our higher education mainly emphasizes the following aspects:

One is knowledge. The specialty of educational technology not only requires the students to master the basic theoretical knowledge and professional knowledge of the specialty, it also requires the knowledge and skill of computer software development and application, database technology, virtual reality technology, network technology and artificial intelligence. But with the professional computer professional graduate students, the professional is not so strong, mainly partial to the theory of knowledge learning.

Second, exchanges and cooperation. Communication is the foundation of interpersonal relationships. For educational technology postgraduates, in addition to the most basic communication skills, the ability to collaborate with peers, but also requires the ability to communicate academically, this ability also includes the ability to communicate with foreign scholars and the ability to communicate with domestic scholars of different disciplines. Cooperation is the bottom logic of the whole society, cooperation can better promote the development of all aspects of an industry. Cooperation includes cooperation with students and teachers, cooperation with other disciplines and cooperation with foreign scholars, in the process of cooperation requires educational technology master's degree students to have a spirit of dedication.

The third is the inherent characteristics. The internal characteristics include ideological and political quality, discipline and law, good conduct, self-planning ability, independent thinking, physical and mental quality, cultural literacy, enterprise, enterprising, and so on. These factors are the essential intrinsic characteristics of educational technology master degree, and are the intrinsic motivation that determines the growth and development of educational technology master degree students.

Fourth, professional ability. The professional ability of educational technology postgraduates is the most basic ability. In the whole process of their training, they are required to have scientific research ability and strong practical ability, ability to read and write foreign language documents, ability to solve problems, solid professional skills, strong innovative quality and strong writing ability.

Fifth, the academic aspect. Academic and scientific literacy are the most basic qualities of educational technology master students, and critical spirit is essential in the process of educational technology master students conducting research, it is also required to have an international and interdisciplinary perspective, to be able to track and analyze the status quo of research at home and abroad, and to have forward-looking thinking, to be able to take the initiative to understand the cutting-edge knowledge of the subject.

Sixth, employment. Employment is a problem that all graduate students must face, and the same is true for educational technology graduates, who are required to have high professional quality when they are educational technology, the necessary entrepreneurial qualities. All the educational technology masters trained by universities are mainly teachers, so they are required to have strong teaching management ability.

Seven is digital literacy. Digital literacy is one of the most important qualities for educational technology masters. Digital literacy promotes the cultivation of educational technology master's digital talents, they are required to master the software and hardware learning technology tools to solve practical teaching problems, to be skilled in the use of information-based education tools, to understand new information technology and applications, with good information literacy.

Finally, after a series of de-weight, the final merger of the following 7 dimensions of a total of 38 competency factors.

Table 2. Dimensions of educational technology competency

Dimensions	Elements of competence
Knowledge	Basic theoretical knowledge of educational technology, Computer related knowledge of educational technology, Professional knowledge
Exchange and cooperation	Academic communication ability, Cooperation and communication ability, International communication ability, Team spirit, Dedication, Sense of responsibility
Inner qualities	Ideological and political quality, Discipline and law, Good conduct, Self-planning ability, Independent thinking, Physical and mental quality, Cultural literacy, Enterprise, Enterprising
Professional ability	Scientific research ability, Practical ability, Foreign language ability, Problem solving ability, Professional skills, Innovative quality, Writing ability
Academic	International Vision, Forward thinking, Transdisciplinarity vision, Scientific literacy, Academic literacy, Critical spirit
Employment	Professional quality, Entrepreneurial quality, Teaching management ability
Digital Literacy	Application of learning technology tools, Information-based education tools, Emerging information technology and application, Information literacy

According to the onion model theory, the competency model of educational technology postgraduates is constructed from the eight dimensions in Table 2. And see in figure 1.

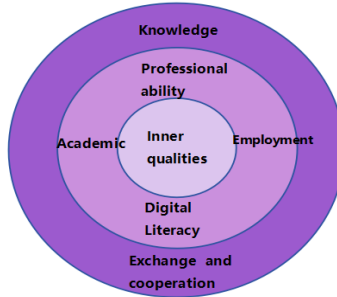


Fig. 1. The competency model of educational technology master degree in the context of digital transformation

3 Strategies for improving the competency of educational technology postgraduates in the context of digital transformation

3.1 To clearly identify the objectives for the training of Digital Master of educational technology talents, and to train potential talents for digital transformation

The objective of educational technology master's education is the basic basis and internal logic for the effective development and implementation of the whole process of education. College administrators and teachers should deeply understand the importance of cultivating reserve talents in digital transformation and its value of the times, actively respond to the guidance of the state educational policy, and give full play to the educational function of colleges and universities, the purpose of this paper is to grasp the direction of formulating the training objectives, to analyze the requirements of the new era and new forms for the educational technology masters, and to optimize the internal logic level of the training objectives for the educational technology masters. Only one-third of the 18 colleges and universities included digitization explicitly in their educational technology master's programs, but mainly in the application of digital resources, rather than the digital environment, digital education product development and other digital technologies as the main educational technology. Therefore, in the process of digital transformation, universities should train educational technology masters, which is not only the epitome of digital transformation teaching in higher education, it is also an effective means of promoting the employment of educational technology masters.

3.2 Promoting international exchanges and cooperation and cultivating international innovative talents

With the acceleration of the globalization of higher education, universities must actively participate in the global competition if they want to realize the goal of world-

oriented construction and train high-quality educational technology masters. More than one-third of the 18 colleges and universities surveyed for this article said they wanted to develop educational technology graduate students with an international perspective and cross-cultural communication skills, this shows that our universities have started to train educational technology postgraduates in the direction of internationalization. While primarily international in scientific research, it is also a new challenge for universities to train educational technology. This requires our country's universities and colleges should carry out multi-level cooperation with foreign trade colleges and foreign scientific research institutions, and complete scientific research projects through cooperation with foreign scholars, to train educational technology professional masters with international vision and cutting-edge scientific thinking. In addition, we can set up joint research centers and laboratories with foreign universities to attract more outstanding scholars to carry out scientific research in China To deepen the training of educational technology masters by organizing or encouraging teachers and students to attend international academic conferences, so as to build a broader international platform for talent growth. In order to promote the whole process of training internationalization.

3.3 To train high-quality professional personnel and to renew their professional ideas

Although there is no problem in ensuring the employment of our educational technology graduate students, it will be difficult to distinguish them from traditional teachers in the future, does not give prominence to its professionalism. Therefore, the training of educational technology masters should take into account their future career extension and aim at the future digital development, the employment management personnel of institutions of higher learning shall organize educational technology master's students to attend corresponding lectures on digital transformation learning, enhance their active learning of relevant knowledge on digital transformation, and renew their career ideas, to be a high-quality digital compound talents. Master of Educational Technology is academic master and professional master the difference lies in his employment direction, that is, the professional nature of the different, so it is particularly important to its professional quality, entrepreneurial quality training. In the course setting, we must pay attention to the training of students' post competence, professional development potential and entrepreneurial potential, with the aim of strengthening their professional quality, entrepreneurial quality and teaching management ability, only in this way can we promote the long-term development of educational technology talents and accomplish the mission of educating people in colleges and universities.

3.4 Strengthen the construction of digital curriculum system and improve the knowledge reserve and practical ability

Colleges and universities should attach importance to the construction of Educational Technology Master's digital curriculum system, and constantly adjust and optimize it. The teaching of educational technology master's course should be based on the principle of OBE achievement-oriented, so as to improve students' professional quality. In

the course system construction, it is necessary to master the degree between specialized courses and elective courses, theoretical knowledge teaching and practical ability teaching, professional discipline foundation and professional ability training, maintain the balance of its development. In the construction of digital curriculum system, it is necessary to embody the systematicness of knowledge. Colleges and universities should regularly study the teaching experience of other colleges and universities and communicate with the teachers of other colleges and universities in a timely manner, to facilitate the sharing of teaching resources among universities, to construct a digital curriculum system suitable for the present, and to form a regional educational technology joint group for postgraduate education. In addition, experts and scholars in relevant fields, heads of enterprise technology responsible for projects related to digitization and R & D personnel engaged in digital education and learning tools should be regularly invited to deliver cutting-edge lectures for graduate students, to help graduate students understand the theoretical frontier of this field.

Practical application is not only the basis of professional degree graduate education, but also an important part of academic master education. In order to get a better job, educational technology postgraduates need to focus on developing students' practical application ability and ability to solve practical problems. First, institutions of higher learning should investigate the employment intentions of educational technology graduates, and establish contacts and co-operation with enterprises and institutions that have employed more educational technology graduates in the past, to seek suggestions and opinions from enterprises and institutions to enhance the practical application ability of educational technology masters. Secondly, the construction of practice curriculum system, the establishment of practice mutual aid groups, universities and enterprises to cooperate, to improve the practice opportunities for students, such as providing practice opportunities once or twice a year, students are encouraged to do a lot of social practice before graduation. For the students who find enterprises or units to participate in the practice, colleges and universities should take measures to test the effect of professional practice and ensure the quality of professional practice. The nature of a master's degree in educational technology is comprehensive. Therefore, in addition to cultivating academic achievements, the master's degree must also focus on professional practice and enhance professional skills and skills, train them into high-level compound talents. Only by constantly improving the comprehensive quality of educational technology professional masters can they be competent for their future jobs and adapt to working life.

4 CONCLUSION

In the context of digital transformation, educational technology master education is facing both opportunities and challenges. As an important place for the training of educational technology postgraduates, universities should, in accordance with the needs of industrial development, explore a multi-agent collaborative education mechanism oriented towards the needs of society and enterprises, improve the quality and effectiveness of educational technology competency development. Through the application of

digital technology to build a comprehensive competency-based talent training mechanism, to better meet the needs of the digital transformation of high-quality master of educational technology talents. In this paper, we collect the talent training plan of the educational technology master students in 18 universities in our country, extract their competency elements, analyze their development status, and construct a educational technology master's competency model, on this basis, the author puts forward four strategies to enhance the competence of educational technology postgraduates: first, to require universities to make clear the training goal of digital educational technology postgraduates, and to train the reserve talents of digital transformation; Second, colleges and universities should provide international exchange and cooperation platform to cultivate international innovative talents; third, students should renew their professional ideas and become high-quality professional talents; fourth, college teaching staff should strengthen the construction of digital curriculum system, improve students' knowledge reserve and practical ability. I hope it can be used as a reference for the training of educational technology talents in our country.

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