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Research on Postgraduate Classroom Construction Framework from the Perspective of Smart Education

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Abstract: Smart education is the future and development direction of higher education. Taking the graduate course Crime and Police Theory as the research subject, the shortcomings of smart education, which include the lack of understanding of the concept of smart education, the limited content structure of smart education, the poor cognition of smart education among teachers and students, and inadequate hardware and technical support for smart education, are systematically analyzed. In view of these shortcomings, several strategies are proposed, including improving the smart education curriculum development plan and management level, ensuring the construction quality of smart education projects, and raising funds for smart education construction from various sources.

Keywords: Smart education; Smart environment; Graduate student; Construction framework

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1. Introduction

From the traditional era to the digital era and even the future intelligent era, smart education is an inevitable system in education [1]. According to the "Overall Layout Plan for the Construction of Digital China," building a "Digital China" is an impetus for advancing China toward modernization in the digital era and a strong support to creating a new national competitive advantage. In face of the new situation, traditional higher education has been challenged to some extent; the status of tertiary institutions as the main platform for knowledge popularization and skill teaching is deteriorating, the authority embodied in teachers' preaching and teaching are constantly weakened, and the teaching contents and methods of are changing [2]. The construction of smart classroom, as the tenet for the implementation of smart education and teaching, is the impetus for the advancement of smart education [3]. How can we better promote classroom teaching with the help of smart education? In this study, the postgraduate course of Crime and Police Theory was taken as an example to explore the feasibility of smart education practice in tertiary institutions in hope that this study would provide reference not only for the design of a smart education system, but also for an improved development of graduate education.

2. Problem orientation: Deficiencies in the construction of graduate smart education

2.1. Lack of understanding of the concept of smart education

With the release of China Smart Education Bluebook (2022), the theoretical and practical aspects of smart education have further developed. Various types of businesses, technologies and academic activities, such

as the World Digital Education Conference, the United Nations Educational, Scientific and Cultural Organization (UNESCO) International Forum on Artificial Intelligence and Education, and the Sino-American (US) Smart Education Conference, have emerge in an endless stream. However, for most frontline teachers, questions such as "What is the core concept of smart education?", "What smart education can bring to people?", "What schools and teachers should do?", and "How to implement it?" are still unclear. Smart education is both remote and unreachable even for a small number of teachers and students. Objectively speaking, for a considerable number of education practitioners, smart education is a new concept. People are still ignorant to the concept of smart education, such as flipped classroom, maker education, and online learning, and idealize them as "wisdom education." In fact, as an exploration and attempt, these practices cannot be simply equated to wisdom education.

2.2. Incomprehensive framework of smart education

After the national smart education service platform was officially launched in March 2022, it has made great progress through the third phase of construction. It is a national and comprehensive teaching resource service platform for higher education. As shown in **Figure 1**, it has five modules [4], comprising of several sub-modules, including curriculum, teaching materials, virtual experiments, academic teaching and research, extracurricular development, special topics, academicians' lectures, massive open online courses (MOOC), information on graduate education, *etc*. After registration, visitors can click the link to access relevant modules and view the video recordings of relevant courses. Research has found that the courses on the platform are linked to specific resources on the MOOC website by default after clicking [4]. Smart education is believed to be a systematic project, and the construction of its content structure is not limited to offering recorded courses on the open website. Objectively speaking, uploading teaching resources onto the network for sharing is an integral part of digital education. However, people cannot simply equate this work to smart education. In other words, smart education can bring more enriched contents to graduate education.

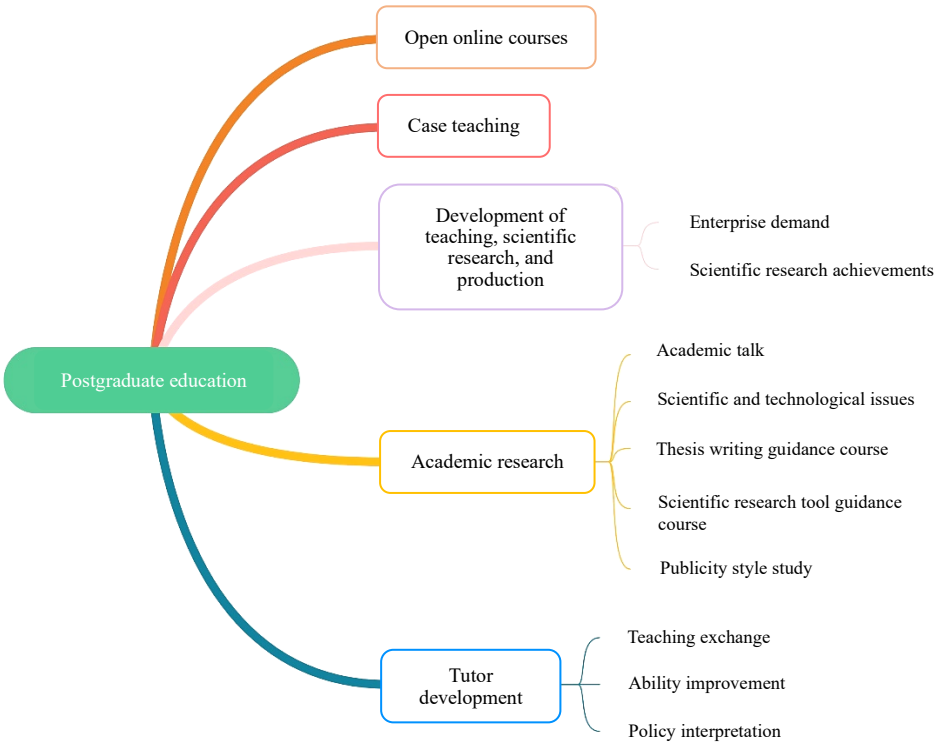

Figure 1. Smart education service platform modules in higher education

2.3. Poor cognition of smart education among teachers and students

Helping teachers understand, accept, and master the use of smart education software and hardware is an important task. In face of the new teaching module, the pressure of whole-process supervision, and the challenges brought on by unruly teaching evaluation, the impact of smart education on teachers can be said to be subversive. Higher education teachers are generally faced with high work pressure. They are required to take on the responsibility for various courses, teach multiple academic degrees (undergraduate, postgraduate, and doctoral), and complete hundreds of class hours in a semester. In addition, the heavy task of scientific research drains their extra energy and time to engage in smart education innovation. In addition, the new teaching module necessitates students to spend more time outside class hours to prepare for lessons. If the smart education module is adopted in every course, the countless tasks at-hand will create stress in students. As a result, they will be tired of coping, and this will diminish the constructive effect of smart education. All these are contrary to the original intentions of wisdom education. However, the development of students in these competencies prepares both teachers and students for new challenges and a rapidly evolving world by aligning formal education with informal education [5].

2.4. Inadequate hardware and technical support in smart education

The promotion and application of smart education cannot be separated from the support of science, technology, and hardware. As a complex system engineering, the technological innovation and practice of smart education require the technical support of enterprises. A study has found that general teachers, especially teachers of humanities and social sciences, lack the ability to develop smart education software. From using a piece of chalk and blackboard to slides and multimedia teaching, this process shows that the promotion of smart education requires not only time, but also the iterative development of technology. During COVID-19, when online teaching was widely used, security issues in information systems, such as "online course explosion," personal data leak, lack of control over online course processes, difficulty in achieving teaching results, *etc*., were exposed. These challenges and deficiencies can be taken as references for the design of smart education modules. In this way, we can continuously improve the technological level of smart education.

3. Construction framework: Practical approach of smart education

The characteristics of graduate classroom construction are as follows: small class size, strong interaction between teachers and students, high theoretical content, emphasis on the cultivation of scientific research ability, and rich and diverse forms of teaching. The construction needs both the support of the smart education module and the design of a core content. It can be carried out from the several aspects, as shown in **Figure 2** [6]. Combining curriculum construction with the smart education framework, several strategies are proposed.

3.1. Improving the smart education curriculum development plan

First, the concept of smart education should be refined. The Crime and Police Theory course aims to equip students with professional theoretical knowledge and practical service skills. By taking high-quality resources for teaching and learning, the course will be able to meet the personalized learning needs of police graduates. We must integrate smart education into the overall education ecology in schools, guide students' learning with smart education concepts, and build an environment for smart learning. The process of cultivating a smart teacher identity takes a long time and requires the awakening of the subject's will. However, the cultivation of this identity a strategic way for teachers to master and breakthrough technical constraints [7]. It would be beneficial to work closely with permanent and part-time instructors to improve teaching strategies and realize resource integration of universities, public security bureaus, enterprises, and

research institutions, provide an impetus for the transformation of the role of teachers in the new era, and ensure that the education ecology is keeping pace with the times and the development of modern information technology [8].

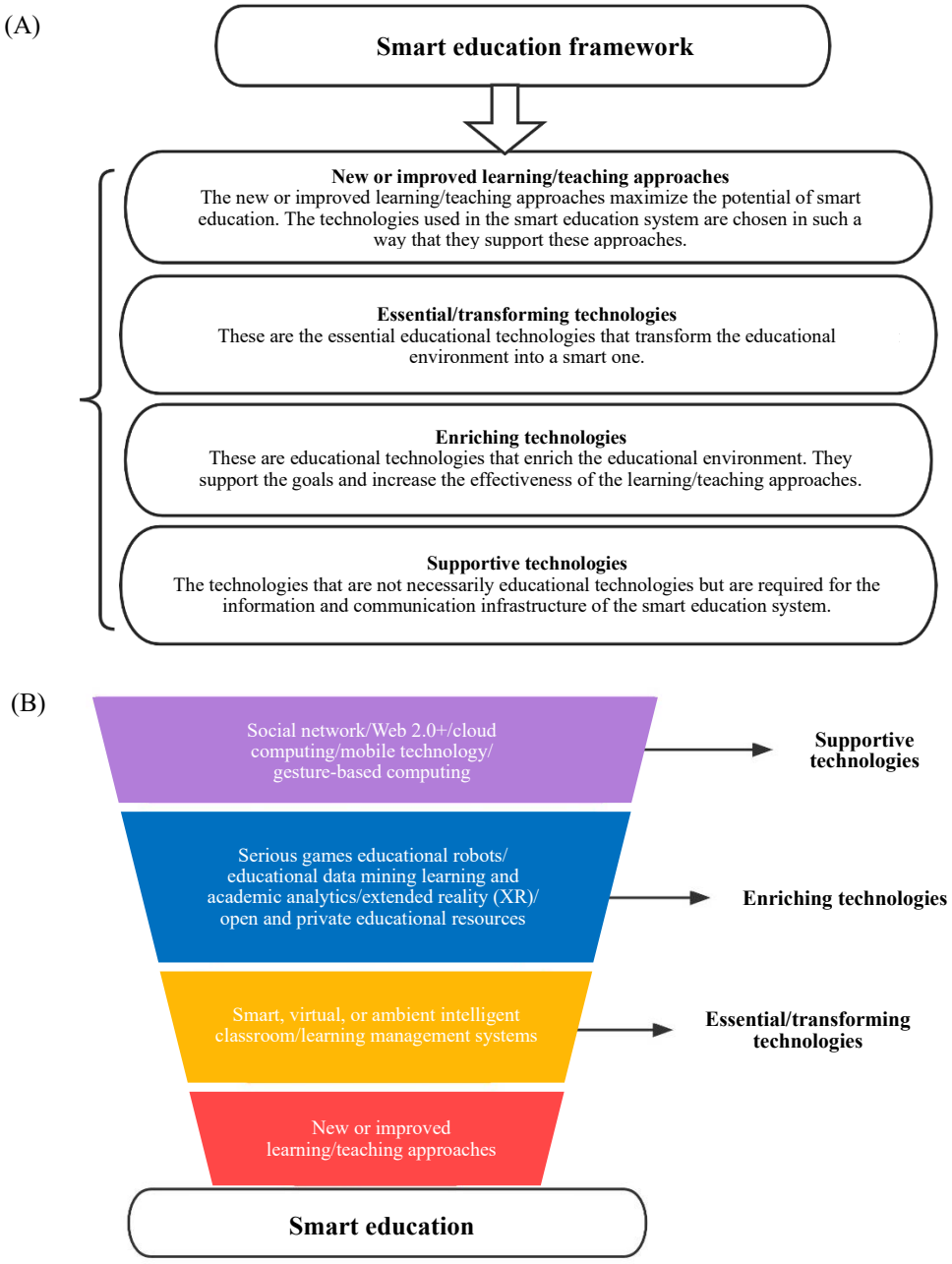

Figure 2. (A) Smart education framework. (B) Smart education technology framework [6]

Second, the smart education module design should be optimized. We should explore from the aspects of capacity innovation and system innovation and cultivate the ecological construction of Crime and Policing Theory with wisdom education; vigorously promote smart classroom, smart teachers, smart teaching research, smart evaluation, and other modules of Crime and Police Theory; as well as make full use of the smart classrooms and teaching systems that have been built in our school and make every effort to build a high-quality graduate education system. With the help of smart curriculum modules such as virtual simulation laboratory, simulated real combat block, immersive crime scene construction, *etc.*,

students' theoretical understanding of crime and practical combat ability will improve. From the standpoint of instructional methods, as shown in **Figure 3**, artificial intelligence (AI) can serve as an intelligent tutor, tutee, learning tool/partner, or policy-making adviser in education [9].

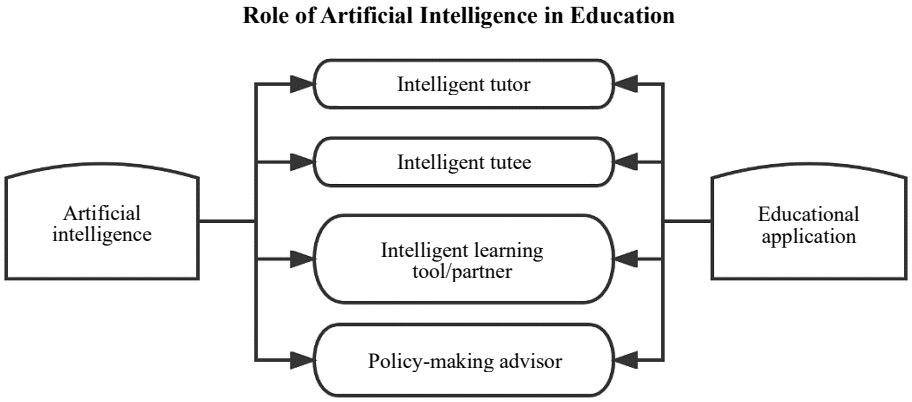

Figure 3. Role of artificial intelligence in education systems

Third, the academic characteristics of the course should be embalmed with smart education. The Crime and Police Theory course highlights the educational means of wisdom education and the academic characteristics of public security colleges in terms of teaching and learning. Focusing on the realization of the teaching objectives of criminology theory and practice, it observes a teaching content based on big data. We should further promote the exchange and interaction between lecturers and students as well as among students themselves and work together to build a knowledge map so that graduate students can better understand the basic theoretical content of criminology and the essentials of police practice in typical cases. Graduate students will be able to expand their knowledge on criminology through active learning and establish the concept of strict law enforcement by having laid a good foundation on the subject.

3.2. Improving the management level of smart education

First, the central position of students should be highlighted. The training for a police master degree is quite different from the undergraduate study of public security. Most of the students are police officers with rich practical experience in law enforcement. Therefore, they have more flexible thinking patterns and tend to focus on real crime scenes in classroom. More attention should be paid to the particularity of students. On the one hand, the course flexibly adopts blending learning and case-based teaching (CBT) approaches to achieve the goal of integrating theory with practice; on the other hand, it highlights the data, ladder, and informatization of instructional design and adopts the target teaching method, adhering to the idea of taking actual combat as the target.

Second, the objectives of the curriculum should be clarified. The reform of smart education should be clearly defined in the course, and the core teaching contents, which include crime phenomenon, causes, prevention, and control, should be emphasized. We should pay attention to the basic concept of practicality, cultivate the hands-on operation ability of police graduates, explore the realization path of smart education to reconstruct the education ecology, and utilize smart education to promote the digitalization and modernization of the educational means of the course. Centering on the training goal of the police master program to nurture professional police talents, a practical training (experiment) program is established based on scientific principles.

Third, the curriculum content should be constructed from a novel superior perspective. The course content must be modified in line with the smart education-integrated course design. With crime and police

theory as the core content, an information (big data) module is added on the basis of the four existing modules: introduction to criminology, crime phenomenon, crime causes, and crime prevention and control. Legal AI and big data systems hold far more cases than a single person, and the ability of AI to retrieve, analyze, and extract facts; analyze legal relationships; and predict judicial decisions is also unparalleled by a normal human being [3]. We should focus on improving the "innovation" of the course content and digitalizing the updated teaching cases. Through the smart education service platform, the public security network decryption materials, local journal resources, foreign police actual combat materials. and other contents can be introduced to constantly enrich the course content and expand the scope of cases.

3.3. Ensuring the construction quality of smart education projects

First, smart assessment should be taken as the starting point to lay a solid foundation for quality construction. On the one hand, we should strengthen the supervision of teachers. Teachers are faced with broad challenges brought on by smart education. These challenges are reflected not only in the comprehensiveness and depth of knowledge, but also in information acquisition and data analysis and processing. On the other hand, we should pay attention to curriculum supervision and management as well as information interaction and sharing. The original evaluation materials should be kept up to date, on-target, and complete so as to improve the teaching effect and evaluation system, while providing reference for other teachers. At the same time, we should pay attention to using big data for online teaching and learning, strengthen the supervision of the whole process, and promote the digital transformation of the evaluation system.

Second, a scientific and measurable curriculum evaluation system should be established. Teaching and examination should be separated based on the smart assessment platform. The smart assessment process highlights classroom performance and practice and establishes a diversified evaluation system that takes into account of regular assessment, homework assessment, mid-term test, and final examination. Teachers must inform the students of the evaluation methods at the beginning of the course and conduct the assessment with the aid of the smart assessment platform. Williams proposed a distributed degree evaluation system integrating blockchain, AI, and big data to focus on students' overall development [10]. This would help cultivate students' comprehensive ability and thinking in handling complex criminal cases when practicing in a risk society.

Third, the support and optimization of teaching and learning should be strengthened with technical support. Through the reconstruction of a series of links such as education model, education governance, education content, education evaluation, teaching methods, and so on by information technology, a new education ecology based on smart education can be created. Especially in the field of information security and encryption, we should strengthen the technical breakthrough and operation management in smart education to ensure the information security as much as possible. A new method based on cloud and recommendation system can be introduced to recommend interesting and useful books to students. This approach allows readers not only to rate the borrowed books, but also receive book recommendations based on the historical data stored in the cloud. The whole suite of systems may benefit readers as they are time-saving and cost-effective. In addition, if conditions permit, students should be encouraged and guided to use intelligent tools, such as ChatGPT and ERNIE Bot, to raise the classroom intelligence level.

3.4. Raising funds for smart education construction from various sources

There are several studies on investment and valuation of smart education in academic circles. Objectively speaking, the strength and intensity of investments are closely related to the success or failure of smart education. According to Omonayajo, the cost of using smart education technologies in the education system is quite low; although the expense incurred to the municipality from implementing new technologies can be high, computers, tablets, and class materials for students are inexpensive [12]. A number of scholars

believe that the construction investment by means of financial investment consumes a considerable sum of money, takes a long time, and may face investment risks. Karimanzira and Rauschenbach hold that multiagent collaborations in a "local area" network between mobile operators and information and communication technology (ICT) enterprises should be adopted in the construction of a smart education ecology. Since there is no network standard, it will be difficult to achieve system integration of multiple ICT subjects when considering the establishment of a credit system in the later stage. This will lead to several problems, such as high cost and a weak credit system [13].

The design, research and development, upgrade, and maintenance of smart education software require a certain amount of investment. The updating, purchasing, installing, and maintaining of hardware are huge expenses. These cost factors must be taken seriously by the implementing body. It is difficult for the government, enterprises, and higher education institutions to bear the huge one-time investment. In the process of promoting the smart education module, gradual investment and decentralized investment can be adopted to include the government, enterprises, actual public security combat departments, higher education institutions, alumni donations, social funds, *etc*. into the financing category.

4. Conclusion

The ultimate goal of technological development is to serve people, and it is impossible to separate the theory and practice of smart education from this attribute. As a high-end form of education system, smart campus has deployed cutting-edge information and communication technologies to improve the effectiveness and efficiency of campus services [14]. The construction of smart education in graduate programs is a long-term process. Even in short term, problems such as the poor cognition of smart education among teachers and students, the inadequate hardware and technical support, and the high pressure of financing have emerged. Looking forward to the future, with the support of smart education planning and design, process supervision and management, construction quality assurance, and funding guarantee, smart education will better promote the development of graduate classroom construction.

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Disclosure statement

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Author contributions

This article was completed by M.C. independently.

References

[1] Yang C, Wu F, 2022, Design Framework of Deep-Learning-Oriented Smart Class. Open Education Research, 28(6): 91–100.

[2] Gu X, Du H, 2021, The Theoretical Framework, Development and Future Prospect of Smart Education. Journal Of East China Normal University (Educational Sciences), 8: 20–32.

[3] Li H, Miao W, 2020, Challenges and Solutions: Colleges and Universities in the Age of Artificial Intelligence Should Pay Attention to the Education of Value Judgment. China Educational Technology, 2: 43–49.

[4] Smart Education of China, viewed on February 28, 2023, https://higher.smartedu.cn

[5] Howard P, 2015, Digital Citizenship in the Afterschool Space: Implications for Education for Sustainable Development. Journal of Teacher Education for Sustainability, 17(1): 23–34.

[6] Demir KA, 2021, Smart Education Framework. Smart Learning Environments, 8(29): 1–36. https://doi.org/10.1186/s40561-021-00170-x

[7] Li Z, Zhang K, 2022, Promoting Wisdom in Smart Teaching: The Weaknesses of Smart Teaching In Colleges in the Era of Smart Education and the Reforms. Jiangsu Higher Education, 12: 115–121 + 150.

[8] Selwyn N, Hillman T, Eynon R, et al., 2020, What's Next for EdTech? Critical Hopes and Concerns for the 2020s. Learning, Media and Technology, 45(01): 1–6.

[9] Hwang G-J, Tu Y-F, 2021, Roles and Research Trends of Artificial Intelligence in Mathematics Education: A Bibliometric Mapping Analysis and Systematic Review. Mathematics, 9(6): 584–603.

[10] Williams P, 2019, Does Competency-Based Education with Block Chain Signal a New Mission for Universities?. Journal of Higher Education Policy and Management, 14(1): 104–117.

[11] Anoop A, Ubale NA, 2020, Cloud Based Collaborative Filtering Algorithm for Library Book Recommender System. 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT), IEEE, 695–703.

[12] Babatomiwa O, Al-Turjman F, Nadire C, 2022, Interactive and Innovative Technologies for Smart Education. Computer Science and Information Systems, 19(3): 1549–1564.

[13] Karimanzira D, Rauschenbach T, 2019, Enhancing Aquaponics Management with IoT-Based Predictive Analytics for Efficient Information Utilization. Information Processing in Agriculture, 6(3): 375–385.

[14] Zhang Y, Yip C, Lu E, et al., 2022, A Systematic Review on Technologies and Applications in Smart Campus: A Human-Centered Case Study. IEEE Access, 10: 16134–16149.