УДК 378.147: 004.9(510)
DOI 10.33514/1694-7851-2025-3/1-499-505

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ЖОГОРКУ ОКУУ ЖАЙЛАРДЫН ОКУТУУЧУЛАРЫНЫН САНАРИПТИК КОМПЕТЕНТТҮҮЛҮГҮН КАЛЫПТАНДЫРУУ: КЫТАЙ БИЛИМ БЕРҮҮ СИСТЕМАСЫНА БАСЫМ ЖАСОО

Аннотация. Макалада билим берүүнүн тез сандриптик трансформациясынын фонунда Кытайдагы жогорку окуу жайлардын мугалимдеринин сандриптик компетенттүүлүгүн өнүктүрүү процесси талданат. Макалада мугалимдердин сандриптик көндүмдөрүн өнүктүрүүнүн негизги аспектилери, анын ичинде мамлекеттик стратегиянын таасири, сандриптик инфраструктураны өнүктүрүү, жасалма интеллект технологияларын жана чоң маалыматтарды билим берүү процессине интеграциялоо каралат. Кесиптик өсүү, насаатчылык, инклюзивдик билим берүү чөйрөсүн түзүү маселелерине, ошондой эле сандриптештирүүнүн батыш моделинен айырмаланган кытайлык мамиленин маданий жана баалуулук өзгөчөлүктөрүнө өзгөчө көңүл бурулат. Кытай системасы борборлоштурулган башкарууга, туруктуу мамлекеттик колдоого жана IT-компаниялар менен стратегиялык өнөктөштүккө багытталганы, бул мугалимдердин сандриптик жетилгендигинин жогорку деңгээлин камсыздай турганы белгиленген. Макалада гибриддик окутуу, сандриптик этика, коопсуздук, университеттер ортосундагы кызматташтык жана сандриптик маданиятты калыптандыруу сыяктуу тармактар талданат. Берилген тажрыйба эффективдүү сандриптик билим берүү чөйрөсүн түзүүгө умтулган башка өлкөлөр үчүн, атап айтканда, мугалимдерди даярдоону модернизациялоо жана жогорку билим берүүнүн сапатын жогорулатуу контекстинде пайдалуу болушу мүмкүн.

Негизги сөздөр: сандриптик компетенттүүлүк, жогорку билим берүү, Кытай, сандриптештирүү, окутуучу, жасалма интеллект, сандриптик трансформация, инфраструктура, аралаш окутуу, сандриптик насаатчылык, билим берүү саясаты.

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ФОРМИРОВАНИЕ ЦИФРОВОЙ КОМПЕТЕНТНОСТИ ПЕДАГОГОВ ВУЗА: АКЦЕНТ НА КИТАЙСКУЮ СИСТЕМУ ОБРАЗОВАНИЯ

Аннотация. Статья посвящена анализу процесса формирования цифровой компетентности педагогов в высших учебных заведениях Китайской Народной Республики на фоне стремительной цифровой трансформации образования. Рассматриваются ключевые аспекты развития цифровых навыков преподавателей, включая влияние государственной стратегии, развитие цифровой инфраструктуры, интеграцию технологий искусственного интеллекта и больших данных в учебный процесс. Особое внимание уделено вопросам профессионального роста, наставничества, создания инклюзивной образовательной среды, а также культурно-ценностным особенностям китайского подхода, отличающегося от западной модели цифровизации. Отмечается, что китайская система ориентирована на централизованное управление, устойчивую государственную поддержку и стратегическое партнёрство с ИТ-компаниями, что обеспечивает высокую степень цифровой зрелости преподавателей. Анализируются такие направления, как гибридное обучение, цифровая этика, безопасность, сотрудничество между университетами и формирование цифровой культуры. Представленный опыт может быть полезен для других стран, стремящихся к построению эффективной цифровой образовательной среды, в частности в контексте модернизации подготовки преподавателей и повышения качества высшего образования.

Ключевые слова: цифровая компетентность, высшее образование, Китай, цифровизация, педагог, искусственный интеллект, цифровая трансформация, цифровая инфраструктура, гибридное обучение, цифровое наставничество, государственная стратегия.

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DEVELOPING DIGITAL COMPETENCE OF UNIVERSITY EDUCATORS: FOCUS ON THE CHINESE EDUCATION SYSTEM

Annotation. The article is devoted to the analysis of the process of developing digital competence among educators in higher education institutions of the People's Republic of China amid the rapid digital transformation of education. It examines key aspects of the development of teachers' digital skills, including the influence of national strategy, the advancement of digital infrastructure, and the integration of artificial intelligence and big data technologies into the educational process. Special attention is given to issues of professional development, mentorship, the creation of an inclusive educational environment, as well as the cultural and value-based characteristics of the Chinese approach, which differs from the Western model of digitalization. It is noted that the Chinese system is oriented toward centralized management, sustained government support, and strategic partnerships with IT companies, which ensures a high level of digital maturity among educators. The article analyzes such areas as hybrid learning, digital ethics, cybersecurity, inter-university collaboration, and the formation of a digital culture. The experience presented may be useful for other countries striving to build an effective digital educational environment, particularly in the context of modernizing teacher training and improving the quality of higher education.

Keywords: digital competence, higher education, China, digitalization, university teachers, artificial intelligence, digital transformation, infrastructure, blended learning, digital mentorship, educational policy.

In the context of the rapid development of digital technologies and artificial intelligence, higher education systems around the world are facing the need to adapt their teaching staff to new requirements. Digital transformation encompasses not only the technical enhancement of the educational process but also the transformation of pedagogical approaches, as well as the mindset of both teachers and students.

China's education system is actively engaged in the digitalization process, which is considered a critical state task and is backed by strong strategic support at the ministerial and party levels. Chinese sources emphasize that digital transformation in higher education involves not just digitizing educational resources but also managing students' personal growth and socialization intelligently, moving toward personalized learning, deeply integrating educational and digital technologies, and modernizing traditional teaching scenarios [1, p. 84].

A defining feature of the modern world is the rapid change in information technology, which provides new opportunities for acquiring knowledge [5, p. 116].

An analysis of scientific publications on this topic reveals a variety of definitions of the concept of **digital competence**. For example, digital competence is defined as a person's ability to use digital information and communication technologies to access, manage, integrate, evaluate, and create information, as well as to communicate, while observing ethical and legal norms—thereby functioning fully in modern society [2].

Summarizing various definitions of a teacher's digital competence, it can be noted that it is a combination of knowledge, skills, and attitudes that enable effective use of digital technologies in educational activities, including class preparation and delivery, student interaction, assessment, as well as participation in scientific and project-based work in a digital environment.

In international practice (particularly in UNESCO and European Commission documents), digital competence includes five key components:

1. Information Literacy

Information literacy is the ability to effectively search for, analyze, select, evaluate, and use digital information. It includes:

- **Information search**: the ability to formulate queries, use search engines, and navigate specialized databases.
- **Critical evaluation**: the ability to distinguish reliable from unreliable sources, detect fake news, manipulation, and disinformation.
- **Information organization**: the ability to structure and store retrieved information and apply it in the appropriate context.
- **Digital consumption**: a conscious and responsible approach to information consumption — filtering out unnecessary content and avoiding "information noise."

2. Communication and Collaboration in the Digital Environment

This component refers to the skills needed for interaction and teamwork with others in digital spaces:

- **Digital communication**: the use of various communication channels (email, messengers, video conferencing, forums, etc.).
- **Etiquette and communication culture**: adherence to norms of digital communication, literacy, politeness, and respect for other users.
- **Online collaboration**: the ability to work effectively in teams using digital tools (e.g., Google Docs, Trello, Slack).
- **Intercultural communication**: the ability to engage with people from different cultures in a global digital environment.

3. Digital Content Creation

This involves not only consuming, but also independently creating high-quality digital content:

- **Content production**: creating texts, images, videos, presentations, websites, podcasts, etc.
- **Editing and processing**: the ability to use appropriate tools to edit media and text.
- **Copyright awareness**: knowledge of intellectual property laws and the ability to work with licenses (such as Creative Commons).
- **Programming and development**: basic coding skills and an understanding of programming fundamentals (as needed).

4. Online Safety

This entails knowledge and application of principles of digital safety and privacy:

- **Cybersecurity**: protecting devices and data from viruses, phishing, hacking, and malware.
- **Data privacy**: the ability to manage privacy settings and understand how to protect personal information.
- **Digital ethics and rights**: understanding one's rights and responsibilities in the digital environment.
- **Psychological safety**: recognizing and protecting against cyberbullying, trolling, and harmful online communities.

5. Problem-Solving and Digital Culture Development

This component focuses on technical skills and a broader understanding of the role of technology in society:

- **Technical literacy**: the ability to operate devices (computers, smartphones, tablets) and software effectively.
- **Troubleshooting**: the ability to independently resolve basic technical problems.
- **Conscious use of technology**: understanding the impact of technology on life, work, health, and the environment.
- **Digital culture**: active participation in digital society, critical thinking, ethical behavior, and continuous learning in the digital sphere.

Features of Developing Digital Competence in China's Education System:

1. **Strategic State Support -** China is actively implementing national strategies aimed at educational digitalization. The “Digital China” program and initiatives under “Made in China 2025” aim to position the country as a global technology leader, including in education. In recent years, the Ministry of Education has implemented the “Smart Education of China” plan, which includes the development of online platforms, digital resources, and training of IT-competent personnel.
2. **Infrastructure and Investment -** Most Chinese universities are equipped with high-tech classrooms, access to AI platforms, cloud data storage, and video conferencing systems. Significant state and private investments ensure continuous technical upgrades.
3. **Professional Development and Training -** To build digital competence among educators, Chinese universities provide:

- Regular professional development courses (including MOOCs);
- Experience exchange among university instructors;
- Collaboration with tech companies (e.g., Huawei, Tencent, Alibaba);
- A “learning-by-doing” model where teachers and students jointly participate in real-world digital projects.

China actively employs the principle of “lifelong learning,” ensuring continuous digital competence development at every stage of a teacher’s career. Digital technologies also enable teachers to apply personalized learning approaches [1, p. 88].

4. **Integration of AI and Big Data in Teaching -** Chinese universities are introducing AI tools, adaptive learning systems, and big data analytics to assess student progress and improve teaching efficiency. This requires teachers to possess not only technical skills but also an understanding of the pedagogical implications of these technologies.

At the same time, emphasis is placed on the development of the following competencies [3, 6]:

• **Technical competence**: Students need hands-on training to learn how to use artificial intelligence technologies. They should understand how different systems work, their functions and capabilities, as well as ways to troubleshoot common issues. Practical workshops, detailed manuals, and technical support can help teaching staff improve their level of technical literacy.

• **Ethical competence**: Students must be aware of the biases and limitations of AI systems and understand when their use may be inappropriate. Education should promote awareness of algorithms, critical thinking, and responsible oversight. Educators need guidance on creating a safe and ethical learning environment, regardless of AI’s capabilities.

• **Assessment competence**: Students need training to effectively evaluate learning using AI systems. This includes understanding data collected by AI tools, interpreting

algorithmic recommendations, recognizing the limitations of automated assessments, and providing well-rounded human feedback.

• **Collaborative learning mindset**: Instead of fearing replacement, students should be encouraged to adopt a collaborative learning mindset with AI as a partner. Through continuous learning and adaptation, educators can respond promptly to innovations. A growth mindset aimed at complementing each other's strengths is of critical importance.

5. **Cultural and Value-Based Aspects -** In China's educational model, digitalization is accompanied by a strong focus on ideological resilience, patriotic education, and cultural tradition preservation. Teachers are expected not only to master digital tools but to use them in nurturing well-rounded individuals in the spirit of "socialism with Chinese characteristics."
6. **Adoption of Hybrid Learning Formats -** Modern Chinese universities are actively developing blended learning, which combines in-person classes with online courses and digital platforms. This approach maximizes the use of digital resources while accommodating diverse student learning styles. Platforms like iCourse, XuetangX, and the Chinese version of MOOCs serve as foundations for implementing flexible formats that enhance student engagement.
7. **Support for Young Teachers and Digital Mentorship -** A key element in China's digital education transformation is the support of early-career educators. Universities are establishing digital mentoring communities where experienced teachers share digital teaching practices with junior colleagues. Additionally, internal university competitions and grant programs are held for the development of innovative digital courses, encouraging ongoing professional growth.
8. **Development of Inter-University Digital Networks and Partnerships -** China is creating large-scale inter-university digital networks and alliances (e.g., the Double First-Class Universities alliance), which facilitate shared educational platforms, resource exchange, and joint development of online programs. This promotes standardization and best-practice sharing across institutions.
9. **Digital Technologies for Inclusive Education -** Chinese universities implement digital solutions aimed at supporting students with disabilities. These include video subtitles, voice assistants, adaptive interfaces, and speech recognition technologies. Digital transformation is thus expanding access to higher education for diverse student groups.
10. **Monitoring and Evaluation of Teachers' Digital Maturity -** Chinese universities are introducing systems for assessing digital competence, including electronic portfolios, self-assessment, and external review. This helps monitor digital maturity and develop individualized professional growth pathways.

All Chinese higher education institutions are equipped with Internet access and high-quality equipment, enabling teachers to apply their practical IT skills. For example, Beijing Normal University was among the first to gain access to the National Research and Education Network in 1995. Additionally, a dedicated Network Center was established at the university, marking the beginning of higher education digitalization in China.

Since 1999, the second phase of digitalization began, focused on the rapid development of a nationwide digital education infrastructure. Since 2003, the third phase has been underway, aiming to create a full-fledged digital campus that allows for effective university management and online education delivery [7, p. 27].

Special attention must also be given to selecting appropriate digital educational resources. Chinese researcher R. Huang emphasizes the following factors:

1. **Content relevance** – Resources should closely relate to the subject and curriculum content, spark students' curiosity, or help solve specific learning tasks.
2. **Appropriate complexity** – Content should not overwhelm students in terms of difficulty or volume.
3. **Logical structure** – Content should be clearly structured and logically organized to help students form a holistic understanding of the subject.
4. **Presentation format** – The material should be presented in a way that is easy for students to process and avoids visual fatigue.
5. **Proper organization of educational resources** – Educational materials (e.g., video, animation, text, e-books, VR) must be effectively organized to provide a clear learning path [4, p. 14].

In comparison with other systems, unlike the Western model—where emphasis is placed on the individual initiative of the teacher—China's digitalization is top-down: the state sets the direction, and universities implement it in a unified format. This enables large-scale results but may reduce flexibility and individualization of teaching approaches.

Conclusions and Recommendations: The development of teachers' digital competence in Chinese universities is a systematic, multi-faceted process supported by the state, business, and the institutions themselves. China's experience demonstrates that:

- Strategic support and centralized management are crucial;
- High-quality infrastructure must be ensured;
- Digital skills should be integrated into teacher training from the beginning of their careers;
- University collaboration with IT companies is essential.

For many countries, including Kyrgyzstan, the Chinese model can serve as an example of building a sustainable digital educational environment with high levels of faculty engagement.

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