Keynote Speech Abstracts

The 18th International Symposium on Teacher Education in East Asia
International Consortium for Universities of Education in East Asia (ICUE) 2024

- Date and Time: Friday, November 29, 2024, 10:00–17:00 KST
- Theme: *Teacher Education in the Age of Artificial Intelligence: Opportunities and Challenges*
- Host: Seoul National University of Education (SNUE), Seoul, Korea (Online)

Keynote Speech I

Development of AI Digital Textbooks: Focusing on the Case of Korea

PARK Mangoo (Professor, Seoul National University of Education, Korea)

English

This presentation will introduce the development of AI digital textbooks and their application in the field, focusing on the case of Korea. The Korean government plans to introduce AI digital textbooks in subjects such as mathematics, English, information technology, and Korean (special education) in 2025, and gradually expand them to all subjects, including Korean, social studies, and science, by 2028. The Korean government is the first in the world to officially introduce AI digital textbooks and has set the motto of “5 million textbooks for 5 million students.” The plan is to provide textbooks equipped with various learning materials and support functions using intelligent information technology, including AI, so that students can engage in customized learning opportunities tailored to their abilities and levels.

AI is transforming not only nearly all industries but also our daily lives. With the help of AI, autonomous driving, delivery robots, automation in the automotive industry, and new drug development using big data in the medical field are making previously inefficient or time-consuming tasks easier to handle. This transformation is no longer an exception in the education sector. AI not only helps students learn more effectively by enabling customized learning based on their data, but also provides teachers with information about individual students, allowing them to plan, execute, and evaluate classes more effectively.

Recently, efforts have been made to help students engage in learning proactively by using data not only on cognitive aspects but also on affective factors, such as learning styles, tendencies, and attitudes. However, as the development and introduction of AI digital textbooks in Korea progresses rapidly, issues have arisen, including insufficient verification of their functions, a lack of awareness among teachers regarding their practical application, and challenges in improving teachers' utilization capabilities within a short time despite extensive training programs.

Additionally, since perceptions of AI digital textbooks by students and teachers can greatly affect how they are used, it is important to recognize that while understanding the functional aspects, such as how to use AI digital textbooks, is crucial, digital literacy education—including the meaning, ethical, and philosophical dimensions of using AI tools—is equally vital.

This forum will explore the significance and limitations of utilizing AI digital textbooks in schools, including their development, functionality, and the roles of teachers, with a focus on the case of Korea.

Korean

이 발표에서는 한국의 경우를 중심으로 AI 디지털교과서의 개발과 현장에서의 적용 방안에 대하여 소개할 것이다. 한국 정부에서 2025년에 ‘AI 디지털교과서’를 수학·영어·정보·국어(특수교육) 과목에 우선 도입하고, 2028년까지 국어·사회·과학 등 전과목 도입을 목표로 단계적 확대를 추진할 예정이다. 한국 정부에서 공식적으로 AI 디지털 교과서를 도입하는 것은 세계 최초로, 정부에서는 “500만 학생을 위한 500백만 개의 교과서”라는 모토를 내 세우면서, 학생 개인의 능력과 수준에 맞는 다양한 맞춤형 학습 기회를 지원할 수 있도록 인공지능을 포함한 지능정보화기술을 활용해 다양한 학습자료 및 학습지원 기능 등을 탑재한 교과서를 제공할 예정이다. 인공지능은 거의 전 산업뿐만 아니라 우리의 삶 전반을 바꾸어 나가도 있다.

AI의 도움으로 자율주행, 배달로봇, 자동차 산업에서의 자동화, 의료 산업에서의 빅데이터를 활용한 신약 개발 등 이전에는 비효율적이거나 시간이 오래 걸리는 일들을 보다 간편하게 처리하고 있다. 이는 이제 교육분야하고 해서 예외가 될 수는 없다. 인공지능은 학생들의 학습 데이터를 기반으로 맞춤형 학습을 가능하도록 하여 학생들의 효과적인 학습을 도울뿐만 아니라, 교사들로 하여금 학생들을 지도하는데 개별 학생에 대한 정보를 제공하여 수업을 효과적으로 계획, 실행, 평가하도록 하고 있다.

최근에는 학생들의 인지적인 측면뿐만 아니라 학생들의 학습 스타일, 성향, 태도 등을 포함한 정의적인 측면의 데이터를 활용하여 학생들이 주도적으로 학습에 참여할 수 있도록 돕기 위한 노력을 하고 있다. 그러나 한국에서 AI 디지털 교과서의 개발 및 도입을 급격히 추진하면서 AI 디지털교과서의 기능에 대한 철저한 검증 부족, AI 디지털 교과서의 현장 적용에 대한 교사들의 인식 부족과 많은 연수 프로그램의 제공에도 짧은 시간 안에 교사들의 활용 역량을 끌어 올리는 데에 대한 어려움 등의 문제를 가지고 있다.

또한, 학생들이나 교사들이 AI 디지털교과서에 대하여 어떻게 인식하느냐에 따라서 활용하는 양상을 매우 다를 수 있으므로, AI 디지털교과서를 어떻게 활용할 것인지와 같은 기능적인 측면도 중요하지만 인공지능 디지털 도구의 활용의 의미와 윤리적이고 철학적인 측면을 포함한 디지털 리터러시 교육이 중요함을 인지할 필요가 있다.

이 포럼에서는 한국의 경우를 중심으로 AI 디지털교과서의 개발, 기능, 교사의 역할 등을 포함한 학교 현장에서 AI 디지털교과서의 활용에 대한 의미와 한계점 등에 대하여 제시할 것이다.

Keynote Speech II

Beyond the Controversy Between “Dao” and “Technology”: The Multiple Cognitions and Active Choices of China’s Teacher Educators in the Technological Era

WANG Yanling (Professor, East China Normal University, China)

English	Chinese
Regarding the relationship between technology and teacher education, a clear "Dao" versus "Tech" debate has emerged among China’s teacher educators. "Dao" refers to the emphasis on the fundamental responsibilities of teaching and nurturing within the Chinese teacher education culture, as well as the pursuit of values such as moral development and the cultivation of humanistic spirit. "Tech," on the other hand, refers to information or digital technologies, resources, and platforms. The core issue of the "Dao" versus "Tech" debate is whether teacher education in the technological era should adhere to the traditional values and humanistic spirit of teacher education or be restructured in response to technological changes. A qualitative study of six "proactive" teacher educators in China finds that technology is not merely a tool for delivering content; teacher educators teach technology while using it to teach. Technology also provides teacher educators with the convenience of offering more personalized guidance, enriching the content and forms of student-student and teacher-student interactions, thereby influencing the personal development of teacher candidates. Technology and teacher education shape each other. Moreover, teacher educators' technological cognition and choices are closely related to the technological platforms, resource development levels, and ease of use at their respective universities. To transcend the debate between “Dao” and “Technology”, it is necessary to establish a symbiotic relationship between teacher education and technological advancement based on the development of “human beings”.	在技术与教师教育的关系上，中国教师教育者中出现了明显的“道”与“技”之争：“道”指中国师范文化中对教书育人基本职责的重视和对道德养成、人文精神培育等方面的价值追求；“技”则是指信息技术或数字技术、资源、平台。“道”与“技”之争的核心问题是：技术时代的教师教育是应该坚守师范教育中的师道传统与人文精神，还是应该顺应技术变革而重构？本研究发现，教师教育中“道”与“技”之争源于技术理性教师教育观对技术的片面理解。对6位“积极行动型”教师教育者的质性研究发现，技术不仅仅是承载内容的工具，教师教育者在运用技术来教的同时也在教技术;技术还赋予教师教育者提供更多个性化指导的便利，丰富了生生互动、师生互动的内容与形式，从而作用于师范生的人格养成。技术与教师教育相互形塑。同时，教师教育者的技术认知与抉择，与所在高校的技术平台、资源建设水平以及使用的便捷程度密切相关。超越“道”与“技”之争，需要立足“人”的发展建立教师教育与技术进步的共生关系。

Keynote Speech III

Educational Technology in the Age of Digital Transformation: Shaping Personalized and Collaborative Learning for Society 5.0

TERASHIMA Kosuke (Professor, Osaka Kyoiku University, Japan)

English	Japanese
Japan's education system is undergoing significant transformation to adapt to the demands of a rapidly evolving digital society. This presentation will explain the current trends and prospects of research in elementary and secondary education in Japan. First, the concept of "Society 5.0," one of the key policy terms in the background of Japan's current elementary and secondary education, will be introduced along with its background. Society 5.0 envisions a society where new scientific and technological advancements, such as AI, enable everyone to enjoy newly created conveniences and benefits, promoting a more mature and information-driven society. In Society 5.0 and beyond, pupils must engage in proactive problem-solving in constantly changing environments. They will also need the ability to continue learning independently to update their knowledge and skills as needed. From this perspective, the presentation will explore the education currently sought in Japan, using the keywords "GIGA School Initiative" and "Individually Optimized Learning." The GIGA School Initiative (Global and Innovation Gateway for All) aims to provide every elementary and junior high school student with a personal computer, ensuring they have constant access to technology in their school environment. Additionally, students are connected to high-speed internet networks, allowing them to utilize cloud-based services to enhance their learning experiences. The presentation will introduce these concepts and examples of actual learning activities being developed. Looking ahead, it is expected that these initiatives will accelerate the digital transformation of society and education. Keywords such as the use of data and generative AI will become increasingly important. In this era, teachers, like children, will also need to continue learning to realize new forms of education, and new teacher training and professional development programs will be necessary.	日本の教育制度は、急速に進化するデジタル社会の需要に適応するため、大きな変革期を迎えている。本講演では、日本の初等中等教育研究の現状と展望について解説する。まず、現在の日本の初等中等教育の背景にある重要な政策用語の一つである「Society 5.0」という概念について、その背景とともに紹介する。Society5.0とは、AIなどの新たな科学技術の進歩により、誰もが新たに生み出された便利さや恩恵を享受し、より成熟した情報化社会を推進する社会を想定している。 ソサエティ5.0以降では、生徒たちは常に変化する環境の中で、主体的に問題解決に取り組まなければならない。また、必要に応じて知識や技能を更新するために、主体的に学び続ける能力も必要となる。 このような観点から、「GIGAスクール構想」と「個別最適な学び」をキーワードに、現在日本で求められている教育のあり方を探る。GIGAスクール構想（Global and Innovation Gateway for All）は、すべての小中学生にパソコンを持たせ、学校環境で常にテクノロジーにアクセスできるようにすることを目的としている。さらに、生徒たちは高速インターネット・ネットワークに接続され、クラウドベースのサービスを利用して学習体験を向上させることができる。本講演では、これらのコンセプトと、実際に開発されている学習活動の例を紹介する。 今後、これらの取り組みにより、社会と教育のデジタル変革が加速することが期待される。データ活用や生成AIといったキーワードの重要性はますます高まるだろう。このような時代には、教師も子どもたちと同じように、新しい教育を実現するために学び続ける必要があり、新たな教員研修や専門能力開発プログラムが必要となる。