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全球智慧教育大会
Global Smart Education Conference

Synthesis Report

Global Smart Education Conference 2023

Education Transformation and Data Governance

18 - 20 August 2023

全球智慧教育合作联盟
Global Smart Education Network

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Beijing Normal University (BNU) grew out of the Education Department of Imperial University of Peking established in 1902, which initiated teacher training in China’s higher education. After the development for over a century, BNU has become a comprehensive and research-intensive university with its main characteristics of basic disciplines in sciences and humanities, teacher education and educational science.

UNESCO IITE

The UNESCO Institute for Information Technologies in Education (UNESCO IITE) was established as an integral part of UNESCO by the General Conference of UNESCO at its 29th session (November 1997). IITE is the only UNESCO category 1 Institute that holds a global mandate for ICT in education.

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Coordinators: ZENG Haijun, MIAO Miao, QIN Zhaohong

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Foreword

As the new round of technological revolution and industrial transformation deepens, digital technology is increasingly becoming a driving force that fundamentally transforms human social thinking, organizational structures, and operational models. It not only provides significant opportunities for innovating pathways, reshaping forms, and promoting development but also brings new challenges. "What is education and its way forward?" has become a topic of collective consideration for countries worldwide. The United Nations Education Transformation Summit pointed out that global education faces severe challenges and a learning crisis. Therefore, it is urgent to promote educational transformation and fully tap into the power of the digital revolution to ensure that quality education and lifelong learning are provided as a common interest and a human right for all, with particular attention to the most marginalized groups. China has set the goal of promoting educational digitalization and building a society and country where everyone pursues lifelong learning. Smart education is the goal of the digital transformation of education. Cultivating talents is the central focus of smart education. Technology empowerment is the driving force behind innovative development in smart education. Data governance is the systematic approach driving the orderly advancement of educational system reform.

The initiative for the Global Smart Education Network (GSENet) was launched during GSE2022. The aim is to establish a partnership comprising researchers, practitioners, technology experts, and policymakers, to support the rethinking and redesign of education systems at the national, regional, and school levels. This initiative seeks to formulate strategic solutions and approaches to reshape and innovate education and establish an equitable, inclusive, and high-quality smart education system.

As the annual conference of GSENet, with the theme of "Education Transformation and Data Governance", GSE2023 shared new trends, new theories and new technologies in the field of smart education through thematic forums, high-end dialogues, exhibitions, workshops and webinars, and disseminated smart education solutions and best practices.

Let us take this conference as an opportunity to join hands to deepen exchanges and cooperation, jointly create a better tomorrow of smart education for the benefit of all mankind, and strive to achieve global sustainable development goals and build a better world.

ZHOU Zuoyu	ZHAN Tao	HUANG Ronghuai
Vice-president, BNU	Director, UNESCO IITE	Co-Dean, Smart Learning Institute of BNU

Co-Chairs of GSE2023 Program Committee

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We benefit from the inputs of our partners, including the National Engineering Research Centre of Cyberlearning and Intelligent Technology; UNESCO International Research and Training Center for Rural Education (INRULED); State Key Laboratory of Virtual Reality Technology and Systems; Strategic Research Base of Education Informatization, Ministry of Education, P.R.China; Capital Normal University, China; Longhua Education Bureau, Shenzhen, China; Asian Institute of Technology (AIT); China Academy of Information and Communications Technology (CAICT); World Broadband Association (WBBA); China Education Association for International Exchange (CEAIE); China Educational Equipment Industry Association (CEEIA); Beijing Design Society (BDS); and China Information Technology Education Magazine.

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Gratitude is also extended to the speakers, moderators, and participants from across the globe, including representatives from governments and international organizations, as well as academic experts, teachers, students and industry practitioners in the field of smart education.

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Organizer

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National Engineering Laboratory
for Cyberlearning and Intelligent Technology

GSENet Beijing Declaration on Smart Education Strategies

Preamble

The founding members of Global Smart Education Network (GSENet) and their collaboration partners met in Beijing, China at the Global Smart Education (GSE) conference held on 18-20 August 2023,

Aiming at promoting follow-up actions of the UN Transforming Education Summit (TES) in 2022 and achieving Sustainable Development Goal 4 (SDG4) and UNESCO Education 2030 Agenda,

Recognizing that cutting-edge technologies and tools (e.g., ChatGPT, Metaverse, Digital Twin), when integrated with smart education planning and practice, will be an important engine to reshape teaching and learning and transform the education system,

Taking into account the collective work and research outcomes coordinated by Beijing Normal University and UNESCO Institute for Information Technologies in Education (UNESCO IITE) jointly with other GSENet founding members and global partners on the national smart education strategy and relevant issues,

Defining Smart education as the educational behaviors (system) provided by schools, regions, or governments, with the characteristics of the high learning experience, learning content adaptation, and teaching efficiency. Modern science and technologies are used to provide diversified support and on-demand services for students, teachers, and parents, the data of participants and learning and teaching processes are recorded and used to promote the quality and equity of education.

Recommending that to promote the adoption and implementation of smart education worldwide, the following recommendation should be considered:

- **Recommendation 1**

  Governments, according to their governing structures and specific conditions, should develop smart education from three key leverage points of transforming teaching and learning methods, building smart digital learning environments, and implementing forward-thinking policy. The overarching considerations of equity, continuous improvement, and multi-sector cooperation for the above leverage points should be fully considered.

- **Recommendation 2**
  Policymakers are encouraged to review, analyze and rebuild policies on Information and Communication Technology (ICT) in education from the policy themes of ICT infrastructure, digital education resources and platforms, curriculum and pedagogy, skills and competencies, governance, educational management and administration, toward smart education.

- **Recommendation 3**
  Local authorities and school leaders need to design and employ smart campus and new learning environments in the effectiveness of learning, efficiency of schooling, efficacy of digital tools & resources, and innovate and monitor the new model of learning and teaching enhanced by technology in personalized learning and differentiated teaching, at all levels of education and skills development.

- **Recommendation 4**
  Researchers and practitioners in collaboration with policy-makers, educators, university leaders, etc., should extend the joint work on smart education, hence further promoting it and also contributing to the UNESCO call on Futures Education.

- **Recommendation 5**
  All relevant stakeholders are urged to promote and reinforce their cooperation driven by smart education strategies to build public services of smart education, such as access to compulsory curriculum, learning and technical supports, and learning analytics in the large-scale learning platforms and open education practices across regions. In this context, GSENet is committed to collaborating with global partners to promote the adoption and implementation of smart education worldwide.

Also noting with concern that smart education systems should focus on the following challenges:

- **Challenge 1**
  Smart education systems and environments should be responsible and human-centered to ensure safe and effective teaching and learning processes.

- **Challenge 2**
  Technology should be used as a facilitator, and augment teachers' competencies rather than replacing them.

- **Challenge 3**
  Smart education systems and environments should go beyond digital resources to use Open Educational Resources (OER) and Open Educational Practices (OEP), hence providing inclusive and innovative pedagogy.

- **Challenge 4**
  With the rapid evolution of technology (e.g., ChatGPT, metaverse), teachers, students and administrators should keep up with these technologies by continuously upskilling their competencies accordingly.

GSENet is committed to networking more global partners from different regions and sectors to promote smart education practices for achieving SDG 4.

Founding members of GSENet:

- Beijing Normal University (BNU)
- UNESCO Institute for Information Technologies in Education (IITE)
- Commonwealth of Learning (COL)
- International society for Technology in Education (ISTE)
- Arab League Educational, Cultural and Scientific Organization (ALECSO)
- Southeast Asia Ministers of Education Organization (SEAMEO)

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Executive Summary

The GSE2023 organized by BNU and UNESCO IITE was held in Beijing from August 18 to 20, where representatives from 40 countries and 16 international organizations gathered to discuss the future of human education. Over 300 speakers and guests aired their views freely and drew a blueprint for smart education. Over 1,300 representatives participated in the conference in person.

The conference made us deeply feel that the global wave of digital transformation of education is unstoppable, the power of technology in enabling education is increasingly strong, the calls and demands for data governance are becoming more urgent, the vision of a wisdom life through smart education is growing stronger, and international cooperation in education is deepening.

> **"Smart education represents a profound transformation of education and concerns the future of humanity."**

Smart education:

An inevitable choice for advancing equitable quality education

Education is the cornerstone of human civilization and the driving force behind societal advancement. The world today is undergoing profound changes unseen in a century. Intelligent technologies represented by artificial intelligence (AI) open up new prospects for education but also bring challenges in terms of educational concepts, teaching methods, learning styles and education governance models. Therefore, education must accurately identify changes, take the initiative to seek them and actively respond to them. "Transformation" became a keyword frequently mentioned by experts and representatives at the conference.

This great transformation will affect every individual and should benefit humanity. UNESCO proposed that it's important to highlight education as a global public good, and the UN Transforming Education Summit emphasized that digital transformation should benefit all learners. Many countries have released digital development strategies and made education an important component thereof. China initiated its strategic action for educational digitalization in 2022 and has integrated and launched online the Smart Education of China platform which brings together the best digital educational resources in the country to benefit 291 million students and other learners in society at large. As a model of public portals for digital learning, the platform won the 2022 UNESCO ICT in Education Prize.

If the digital transformation of education is a digitalization process involving all factors, processes, services and fields within the education system, then smart education that holds people's high expectations for future education is the target form of the digital transformation of education. "**As a new form of education in the digital age, smart education is an inevitable choice for us to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**," said **H.E. Mr CHEN Jie**, Vice Minister of Education of P.R.China and Chairperson of National Commission of the People's Republic of China for UNESCO.

During the conference, **representatives from various countries and international organizations presented initiatives and experience in promoting educational development, bridging the digital divide and reducing learning poverty with information technologies**.

- **H.E. Mrs Leela Devi Dookun-Luchoomun**, Vice Prime Minister and Minister of Education, Tertiary Education, Science and Technology of Mauritius, presented the Government of Mauritius's efforts in promoting lifelong learning through technology and called for international cooperation in technology to strengthen lifelong learning supported by technology.
- **H.E. Mr Azat Atayev**, Deputy Minister of Education of Turkmenistan, stated that Turkmenistan is working to transform education through new initiatives such as creating the Concept for the Development of a Digital Education System, using teaching methods that integrate new technologies and supporting educational decision-making with data analytics.
- **Mr Mahmoud Zouaoui**, Chief of the Staff of the Tunisian Ministry of Higher Education and Scientific Research, presented the digital platform projects and educational information systems in higher education in his country, "These new initiatives can enable researchers, teachers and students to better utilize technology for learning, use resources efficiently and narrow the digital divide, and even help policymakers and teachers make scientific decisions, improve the quality of education and facilitate the development of smart education."
- **H.E. Dr. Susil Premajayantha**, Minister of Education of Sri Lanka, introduced Sri Lanka's educational development and exploration of promoting education transformation with information technologies.

Smart education has started a new chapter in the development of education. The connotations, characteristics and development paths of smart education are important issues of concern in academia and are among the core topics of the conference. **Many experts shared their thoughts on smart education during the conference.**

- **Professor CHEN Li** from Beijing Normal University explained the fundamental principles of how the Internet promotes education transformation, proposed the philosophical thought of Internet + Education and revealed the teaching law of Internet + Education.
- During the release of his new book, *Future Education Transformed by Artificial Intelligence*, **Professor HUANG Ronghuai**, Co-Dean of the Smart Learning Institute of Beijing Normal University, presented concepts of education for the age of intelligence, including the crowdsourced and shared knowledge, the intelligently connected and structured learning, the integrated and open curriculum, and the human-AI collaborative teaching.
- According to **Professor ZHU Zhiting**, a tenured professor at East China Normal University, smart education should create a technologically integrated learning ecosystem and provide smart learning, smart assessment and smart services to learners using data wisdom, teaching wisdom and cultural wisdom.
- According to **Dr. SHAN Zhiguang**, Director of the Department of Informatization and Industry Development, State Information Center, smart education is a transformation and upgrade of education and its foundation lies in digital education, interest-based education, psychological education and talent education. The core of developing smart education lies in idea innovation, data driving, intelligent optimization and model reengineering, with new-generation information and communication technologies (ICTs) used to reshape and restructure paradigms, thereby reconstructing scenarios, operations and services.

Academia's theoretical construction for smart education is still underway, and this process may continue as technology advances. However, one thing is clear: smart education will break through the temporal and spatial constraints of traditional education so that everyone can learn whenever and wherever they want, and smart education will greatly promote the building of a learning society where lifelong learning is pursued by all. "The 21st century belongs to lifelong learners. UN SDG 4 is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030," said **Professor Asha S. Kanwar**, President and CEO of the Commonwealth of Learning. **Mr MO Yan**, winner of the Nobel Prize in Literature and professor at Beijing Normal University, stated that lifelong learning becomes extremely important in the age of intelligence. "We must keep pace with the times and keep track of and learn new things to avoid being obliterated by the times."

At the Forum on Educational Digitalization and Lifelong Learning, **Mr Mohamed Ould Amar**, Director-General of the Arab League Educational, Cultural and Scientific Organization (ALECSO), presented the AI and education-related projects ALECSO is promoting. "We hold Arab Code Week to promote the popularization of programming culture in the Arab world. We use blockchain technology to verify university degree certificates to help students pursue advanced studies and get employed successfully. We have also launched an education platform to guide the younger generation into the Metaverse and the world of NFTs."

Three academicians discussed talent cultivation in higher education in the age of intelligence during the conference.

- **Academician LV Jian** from the Chinese Academy of Sciences proposed the integration of "the way of educating people, the way of the Great Learning and the way of the times" and shared the practical experience of Nanjing University providing core support for high-quality cultivation of talents through high-level disciplines.
- **Academician ZHANG Jun** from the Chinese Academy of Engineering stated that the new relations of production formed by people, materials and machines in the future will drive smart education toward "green education", namely a new form of education that truly makes learning ubiquitous and innovation constantly emerge. He also presented the Beijing Institute of Technology's building of a comprehensive system for smart education and innovation in cultivating top-notch innovative talents.
- According to **Academician CHEN Xiaohong** from the Chinese Academy of Engineering, to meet the challenges of digital intelligence technology, colleges and universities should focus on multidisciplinary and innovative education and cultivate innovative, entrepreneurial, applied and compound high-level talents through innovation in teaching space, teaching models, teaching resources and teaching evaluation.

Widely used AI in social life will replace a large number of human workers, leading to new structural unemployment. Therefore, workers must improve themselves to adapt to the changing times. Vocational education and skill training will accompany workers throughout their careers, and the concept of lifelong learning will gradually take root in people's minds. **Experts have emphasized the great urgency of transforming vocational education and that digital technology should be fully employed and the cultivation of high-quality skilled talents should be focused on in vocational education.**

- **Professor SUN Shanxue**, member of the Expert Advisory Committee for Educational Digitalization of the Ministry of Education and professor from the Graduate School of Education of Beijing Foreign Studies University, proposed that a new digital ecosystem for vocational colleges should be built and the digital literacy and skills of vocational college teachers should be defined, so as to promote high-quality vocational education.
- **Professor WANG Libing**, Director a.i., Chief of Section for Educational Innovation and Skills Development (EISD), UNESCO Multisectoral Regional Office in Bangkok, shared key strategies for advancing vocational education & training and skill development.
- **Professor ZENG Tianshan**, Deputy Director of the Center for Vocational Education Development, Ministry of Education, P.R. China, shared views on reform on teachers, textbooks and teaching methods in vocational education empowered by digitalization, i.e., changes to teachers, textbooks and teaching methods in the background of digital transformation.

The TVET Leadership and Management Benchmarking Programme was held during the Global Smart Education Conference, to promote social, economic, educational, and cultural development in China and Southeast Asian countries and deepen cooperation in technical and vocational education and training (TVET) between the two sides. Officials from education authorities and principals and administrators of vocational colleges from eight countries, including Brunei Darussalam, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Timor-Leste, discussed how to construct a more effective and flexible TVET system using digital technology and innovative approaches, and they went on field trips and paid visits to some places.

Strategic planning:

A grand blueprint for digital transformation

The new round of sci-tech revolution and industrial changes is rapidly evolving and is reconstructing the educational ecosystem and vision. **A focus on strategic planning for AI and rational design of a policy framework for smart education will be the support and guarantee for promoting teaching innovation and accelerating digital transformation.**

- **H.E. Mr CHEN Jie**, Vice Minister of Education of P.R.China stated that developing smart education is a major project in education transformation. It requires huge investment and will produce a far-reaching impact, and it necessitates systematic and scientific planning as well as effective policy measures.
- **Dr. Martín Benavides**, Director of the UNESCO International Institute for Educational Planning (IIEP) said: "Technology shall be integrated into a broader government strategy, so as to effectively address the continuing educational challenges. The planning and management ability of the education system shall be improved to enhance the digital ability of students, educators and all participants in the education system. In this way, they can successfully interact with technology in a responsible manner."

During the Forum on Educational Digitalization Strategy and Policy Planning, **experts shared their understanding of educational digitalization strategy and policy planning and their latest practical explorations in the digital transformation of education**.

- **Ms SONG Shanping**, Executive Director of the China National Institute for Education and Social Development, said, "The formulation of macro policies should fully consider the inclusiveness of education and ensure that digital educational resources are available to every learner and that every child can equally access opportunities brought by digital education."
- **Professor ZHANG Zhiyong**, Director of the National High-end Think Tank of Education Survey Center at Beijing Normal University, stated that the deepening of comprehensive education reform requires accelerating the reform of education-related government performance evaluation, advancing the reform of the basic education system, promoting digital education empowerment, deepening the reform of the examination and enrollment system, establishing a modern education governance system and strengthening educational expenditure guarantees, so as to advance the building of a leading country in education with high quality.
- **Mr Raúl Valdés-Cotera**, Team Leader of the UNESCO Lifelong Learning Policies and Strategies Programme of the UNESCO Institute for Lifelong Learning, proposed expanding the opportunities for receiving higher education through digital technology. He said, "Many universities and higher education institutions have been strategically using online learning tools to provide learning opportunities for more learners, especially marginalized and vulnerable groups. Promoting the exchanges of higher education knowledge, experience and resources within and between countries is crucial to strengthening technology's support for education and expanding access and diversity."
- **Ms Harlena Harris**, Program Director of the APEC Human Resources Development Working Group, said, "Successful education requires policy design, determination and capability building, which is very challenging." She stated that it's important to empower ideas through technology, so as to transform the education model.
- **Mr Andreas Schleicher**, Director for the Directorate of Education and Skill of OECD, advocated study in the digital world.

From the perspective of practice, the impact of national strategic planning and macro policies on education is beginning to show on **regional education transformation**.

- **Mr ZHANG Xuezheng**, Deputy Director of the Education and Sports Bureau of Luoyang Xigong District, stated that smart education gives "wings" to the quality and balanced development of regional compulsory education and contributes to the high-quality development of education in Xigong District.
- **Mr HOU Yuandong**, Director of the Wenzhou Educational Technology Center, Zhejiang Province, presented the "digital brain" for education in Wenzhou and said, "Wenzhou has built an integrated application platform called 'Studious Wenzhou', created a cross-departmental and cross-level education coordination mechanism and constructed a smart education ecosystem."

Technology empowerment:

Strong impetus to education transformation

ChatGPT's going viral has made AI foundation models known to the public for the first time. ChatGPT can generate high-quality text, images, videos, etc. through deep learning of massive data. The penetration and widespread use of generative AI in the field of education will produce a great impact on teaching models, learning styles, evaluation methods, etc. and make the ethical issues of AI applications in education more complex. The enormous potential and broad application prospects of foundation models have attracted widespread attention. **Two forums on generative AI attracted the attention of numerous participants during the conference.**

- "Generative AI and foundation model technology are developing toward high complexity, high efficiency and integration with other AI technologies," said **Professor WU Fati**, Dean of the School of Educational Technology, Faculty of Education, Beijing Normal University. He said, "AI applications in education will help enhance the personalized learning experience, create adaptive learning environments, spark inspiration and creation and contribute to human-machine collaborative teaching and high-quality educational resource creation."
- **Professor John Shawe-Taylor**, Director of the International Research Centre on Artificial Intelligence under UNESCO and professor at University College London, emphasized the need to promote the integration of AI and education in a human-centric approach.
- **Professor Neil Selwyn** from Monash University said: “We should take a rational and cautious approach to AI's impact on education. Excessive hype and complete banning are undesirable." He analyzed the boundaries, principles and future scenarios of AI applications in education and emphasized that close attention should be paid to social criticisms and concerns regarding AI applications in education.
- **Professor HUANG Hua**, Executive Dean of the School of Artificial Intelligence of Beijing Normal University, reviewed the development history of AI and generative AI, analyzed generative AI's significant impact on education with examples, including teaching plan generation, homework correcting, intelligent question setting and solving and search functionality, and pointed out problems and challenges of generative AI in personalization and complex reasoning.

A Human-machine Dialogue activity was specially held at the Forum on Generative Artificial Intelligence and Futures of Education, where experts in the field of smart education, teachers and students were invited to dialogue with four different AI foundation models and answer questions and participate in discussions synchronously with machines. **Professor JIAO Jianli**, Director of the Research Center of Future Education at South China Normal University, pointed out 10 challenges facing the applications of generative AI in education, and **student ZHONG Zixiao** from Kangding No. 2 Middle School in Kangding City, Sichuan Province and **student ZHOU Runzhou** from Sanhe Town Central Primary School in Tiantai County, Taizhou City, Zhejiang Province raised interesting questions, such as "What role will AI play in the future?", "Will AI replace my teacher?" and "Are there aliens in the world?"

Generative foundation models provide new ideas and methods for psychological assessment research. At the International Forum on Generative AI Large Models and Psychological Assessment, internationally renowned experts and industry practitioners were invited to share their research results, practical experience and innovative ideas in this field. **Professor John Rust** from the University of Cambridge presented the impact of AI on psychometrics, and **Professor Jinyan FAN** from the Psychology Department at Auburn University explained how to optimize personality assessments in scenarios such as recruitment interviews based on personalized data generated by AI chatbots. **Professor LUO Fang** from Beijing Normal University shared automated scoring attempts based on foundation models, and **Assistant Professor Yeun Joon Kim** from Cambridge Judge Business School analyzed the prospects for AI creativity and stated that the correct use of ChatGPT will lead to greater innovation capabilities in human-machine cooperation.

"Digital transformation represents the general trend and is a profound self-reform," said **Professor ZHOU Aoying**, Vice President of East China Normal University, at the Forum on Technology-Empowered Educational Transformation. He said, "Developing educational technology is the fundamental path to achieving the digital transformation of education. This means using data empowerment and sci-tech assistance to promote the digital transformation of education and realize the beautiful vision of smart education." **Mr Richard Culatta**, CEO of the International Society for Technology in Education (ISTE), emphasized the need to teach the principles and application skills of AI to young people, to help them find solutions to problems using AI, and said, "It's important to prepare young people so they can collaborate in teams under conditions of human-machine synergy." **Professor LI Yanyan** from Beijing Normal University stated that the construction of a high-quality education system is in urgent need of the intelligent upgrading of learning environments and three-dimensional comprehensive teaching fields should be built to construct learner-centric learning environments and deliver precise learning services. "Cloud-edge-end collaborative multimodal perception will strengthen multidimensional monitoring of learning states, full-chain analysis of the learning process will help with precision teaching decision-making, cross-field integration will support multi-granularity learner portrait depicting and human-machine synergy will empower adaptive learning support and services," said Professor LI Yanyan.

The Forum on Digital Campus and Intelligent Educational Equipment focused on the **core issue of solidly advancing the construction of new infrastructure for education and shoring up the digital foundation of a high-quality education system**, where experts discussed topics, including digital campus construction standards and applications, intelligent educational equipment and technical solutions, intelligent educational product evaluations and industry-university-research collaborative innovation.

- **Mr LI Ying**, Secretary General of the China Educational Equipment Industry Association (CEEIA), remarked that educational equipment is the physical foundation for education modernization. It provides a key guarantee for the promotion of equity and high quality in education in the new era, as well as for the development of innovative talents. He called for an accelerated standardization of educational equipment and the use of such standards as a strategic resource so that educational innovations have a role to play. Educational equipment will thus become a bridge for industrialization and the commercial application of innovations.
- **Ms YANG Fei**, Deputy Director of the Center for Educational Technology and Resource Development of the Ministry of Education (National Center for Educational Technology, NCET), presented the development and application of the Smart Education of China platform for primary and secondary schools.
- **Professor YU Shengquan** from Beijing Normal University shared his thoughts and practices on the construction of a smart campus service ecosystem.
- **Professor HU Xiaoyong**, Vice Dean of the Institute of Artificial Intelligence in Education of South China Normal University, gave a presentation on the research results of collaborative innovation between the industry, academia and university on scenario-oriented AI in education.

For the future, **Professor ZHAO Qinping**, Academician of the Chinese Academy of Engineering, said that the connected objects of "IoE of Virtual-Real Convergence" will be extended to the digital twins of physical objects, human incarnations and digitally native objects. It would open up a space full of hope, where human beings survive and travel freely in the physical and digital worlds at the same time. In the future, VR 2.0 will be integrated into a new generation of learning environments to better help learners learn easily, lovingly and effectively.

A group of business representatives shared their best cases and solutions in driving the digital transformation of education with information technology. They were from companies such as Netdragon Websoft, China Unicom, iFlytek, Tsinghua Unigroup MoEdu, H3C Group, Baidu, Huawei, Alibaba Cloud, Jing Shi Rui Dao, 17 Education & Technology Group, Tencent Education, Onion Academy, Squirrel Ai Learning, OUR SCHOOL, Purity in Zixi, Rokid, and Kingsha. During the conference, the "Smart Education Exhibition" was also held in parallel, where many companies displayed their latest smart education products and services.

Data governmence:

A strong guarantee for sustainable development

Under the theme of "Education Transformation and Data Governance" and through holding the Forum on Data Governance and Cognitive Development, the conference expressed a strong interest in the issue of sustainable development in education. Experts, scholars and business people from universities, research institutes, technology companies and other fields related to digital governance in education engaged in an in-depth discussion on the issues including data governance, data decision-making, data management, data-related legislation and regulation, etc. from different perspectives.

- "We will establish a full-life-cycle data security governance system, which involves a sound data security classification and grading system, a detailed data authority management mechanism, and an enhanced awareness of data security among users," said **Mr LEI Chaozi**, Director General of the Department of Science, Technology and Informatization of the Ministry of Education, "The Chinese government will continue to pursue deep and profound actions in line with the national strategy of educational digitalization, facilitating change and innovation in education through the development and use of big data in education."
- As such, **Ms Anamarija Viček**, State Secretary of the Ministry of Education of Serbia, shared her views on the digital evolution and transformation of education, as well as the progress and successes of digital governance in Serbia.
- **Professor Mammo Muchie**, a fellow of the Academy of Science of South Africa, advocated that the international community should work together to build a cyberspace and a cyberspace community of a shared future of peace, security, openness, cooperation and order.
- **Professor LIU Ting**, Vice President of Harbin Institute of Technology, took ChatGPT as an example to show a big AI model and its application. "ChatGPT could be the first and the only major invention in the history of mankind so far where the exact principle is unknown," as he put it, "ChatGPT is an outpouring of intelligence that makes dramatic breakthroughs in online retention of immense information, conversational comprehension of arbitrary tasks, mental reasoning of complex logic, text generation, and learning and evolution of instantaneous new knowledge." In his opinion, the future of big model development lies in the application of industry private data to construct a big model of the industry or of the scene.
- **Professor CHEN Guangju**, Vice Director of the School Affairs Committee and Vice President of the Alumni Association of BNU, provided his insight that in the process of educational digitalization superimposed on the rapid development of AI technology, data has emerged as a core component in which learning is increasingly taking place in an Internet environment. "And, the key to the digital transformation of education lies in the acquisition of real data, the scientific design of underlying algorithms, the

efficient and energy-saving use of arithmetic networks, and the practice of diverse and effective governance."

- **Professor TANG Yayang**, Secretary of the Party Committee of Hunan University of Science and Technology, presented his research findings on the Smart Education of China platform for primary and secondary schools to empower the quality development of basic education.
- **Ms MENG Ying**, Director of Longhua Education Bureau of Shenzhen, shared the development path of AI education in the district. Longhua District launched the first district-level AI education program in Shenzhen, with high-tech industries as the core and a balance of modern service industries and advanced manufacturing industries, which is a pattern characterized by "1+4+N". To make the effect of AI education better and to train top innovative talents, initiatives were introduced in Longhua District to prepare innovative curricula, to create special educational resources, to optimize its platform's supportive functions, to develop the faculty, to provide incentives for young people to practice and innovate, and to take a step further in interdisciplinary education.
- **Ms WANG Xiaoli**, Deputy Secretary of the Party Committee of the China Academy of Information
- and Communications Technology (CAICT), gave a brief introduction on the evolution of cloud-network convergence technology and the trend of its application in global education.
- **Dr. TONG Lili**, Deputy Director of the Educational Informatization Strategy Research Base (Beijing) of the Ministry of Education and Associate Professor of Beijing Normal University, provided her analysis on the new path of cognitive development driven by AIGC.
- As **Professor Shahbaz Khan**, Director of the UNESCO Office in China, said, "The complex applications of technology in education have to be evaluated holistically. AI must be human-centred, aiming to serve and empower people, and be ethical, avoiding discrimination and following ethical guidelines such as fairness, transparency, and interpretability."

The efficiency of regional management and the effectiveness of education were improved thanks to the construction of the data center as well as standardized data governance. According to **Mr GU Ruihua**, Director of Suzhou Center for Education Technology in Jiangsu Province, "With the mutual authentication and request-free call of e-Cert licenses across ranks and departments, school clerks are now able to execute one-stop approval for enrollment without face-to-face meetings with parents." **Ms ZHANG Ying**, Chief Inspector of Schools of the People's Government of Chenghua District in Chengdu, Sichuan Province, said, "To fulfil the requirements of the national strategy in data governance and the pursuit of quality and even development of regional education, we have focused our efforts on data-supported teaching, learning, research, management, and evaluation. The whole region is pushing for optimization and innovation in the construction of the integrated district-school platform as well as the management and applications of it continuously."

Regional transformation:

A practical exploration of build a new educational ecosystem

The "*Smart Education Demonstration Zone*" Project initiated by the Ministry of Education is a move towards the realization of smart education, as well as an exploration and experiment in the reform and development of education in China. Regional development is about the implementation of the national strategy for education at a large scale and the interests of teachers and students at a small scale.

The Forum on the New Ecology of Regional Smart Education and the Forum on the Digital Transformation of Regional Education, were thus the most attended and the most popular at the conference.

The experts present at the conference discussed in depth what characteristics should be given to this smart education demonstration zone and what mechanisms should be adopted for the sustainable development of smart education in the region. Moreover, **they shared their views on how to digitalize education to create an alternative path for education development and to map out a new pattern.**

- **Mr REN Changshan**, Division Chief of the Division of Education Informatization and Network Security, Department of Science, Technology and Informatization of the Ministry of Education, released the "2023 List of Best Practices of Smart Education", "Constructing Regional Smart Education Ecosystems in China" and "Smart Education Best Practices in Chinese Schools".
- **Professor Chee-Kit Looi** from The Education University of Hong Kong remarked that teacher readiness and AI literacy enhancement are the key paths for the digital transformation of education.
- **Ms MA Li**, Deputy Director of the Education Department of Ningxia Hui Autonomous Region, shared the provincial best practice of leading the development of quality and balanced basic education through digitalization.
- **Mr CUI Changhong**, Deputy Director of the Sichuan Provincial Department of Education, shared Sichuan's best practices in the digital transformation of education with the topic of "Promoting Quality and Balance in Education with Digital Empowerment". He underlined that it is necessary to prioritize needs and effectiveness to inspire transformation, which is a solution to the conflict between high-quality development of education and uneven development between regions, urban and rural areas, and schools.

Haidian District of Beijing, Wenzhou City of Zhejiang Province, Nanchang City of Jiangxi Province, Minhang District of Shanghai, and Wuhan City of Hubei Province are the sites where the *Smart Education Demonstration Zone Construction Project* works. **Representatives from those sites presented their approaches in exploring the circumstances, models, services, and reforms of governance mechanisms that support smart education**. It was evident that they were effectively adapting to local conditions and demonstrating great innovation in their practices.

- **Ms DU Rongzhen**, Director of the Haidian Education Committee at Beijing, talked about the effectiveness and experience of Haidian in driving forward the construction of a new ecosystem of smart education in the context of digital transformation across four dimensions: construction, application, integration and innovation. Haidian District has brought about an effective convergence between the educative essence of education and the innovative features of digitalization. In particular, initiatives have been taken such as upgrading the digital support environment, creating characteristic smart campuses, encouraging innovation in teaching and learning modes, and making high-quality educational resources widely available. It thus taps into the inherent potential of smart education in terms of environment, tools and resources.
- **Ms HUANG Yan**, Director of Nanchang Municipal Education Bureau of Jiangxi Province, shared the Nanchang practices of data-led modernization of education governance. Nanchang strives to provide better science education. In particular, it empowers the optimization of schooling and governance mechanisms with enrollment data, the integration of school and social resources with practice data, and the innovation of teaching and assessment systems with academic data.

Representatives from educational departments in Bengbu City of Anhui Province, Guangzhou City of Guangdong Province, Wuhou District of Chengdu City of Sichuan Province, and Suzhou City of Jiangsu Province engaged in a dialogue on the opportunities and challenges of in-depth smart education development.

Representatives from educational departments in Changsha of Hunan Province, Baoshan District and Changning District of Shanghai, Yichang of Hubei Province, Liangjiang District of Chongqing, Fuzhou of Jiangxi Province, Erdos of Inner Mongolia, and Fuzhou of Fujian Province shared their **best practices in constructing a favorable digitalization system that empowers high-quality education**.

- **Mr SUN Chuangui**, Director of Changsha Municipal Education Bureau of Hunan Province, presented an exploration of smart technology to empower the reform of value-added evaluation of education quality in Changsha's general secondary schools. Changsha has integrated the latest information technology, such as big data and AI, into the comprehensive evaluation of education quality in general secondary schools, with a view to detailing the evaluation index system, developing evaluation and analysis models, and stepping up the application of evaluation results. This initiative has solved bottlenecks in conducting comprehensive evaluations, handling value-added evaluations, and applying evaluation results.
- Changning District is the first experimental zone for the digital transformation of education in Shanghai. "Focusing on the three keywords of base, data, and ecology, Changning District has embarked on a feasible path to promote the digital transformation of 'standardization + personalization' education throughout the district," said **Ms XIONG Qiuju**, Director of the Changning Education Bureau, Shanghai, China.
- **Ms DENG Yuhua**, Director of the Yichang Municipal Education Bureau of Hubei Province, shared the experience of developing smart education in Yichang. By seizing the strategic opportunity of smart city construction, building an "educational brain", strengthening the foundation of the education center, and improving the level of education governance, Yichang of Hubei Province has innovated educational application scenarios and continuously promoted the digital transformation of education.

The balanced development of regional education cannot be separated from the revitalization of rural education. "Technology-enabled education and economic imbalance between regions should not be limiting factors for children's future development. We should break down barriers and strive to enable students from all regions to engage in smart learning with technical support," said **Mr YANG Yinfu**, Vice President and Secretary General of the Chinese Society of Education. With the core theme of equity and inclusion in education, the transformation of rural education and the education of children in rural and remote areas are the most concerned issues for the participants. **Experts discussed cutting-edge issues such as how to seize the development opportunities brought by smart technologies, promote the high-quality and balanced development of urban and rural education, explore educational solutions for smart villages and sustainable rural development, and assist in the implementation of rural revitalization strategy and the UN SDG.**

Dr. Monserrat Creamer, former Minister of Education of Ecuador, shared Ecuador's innovative practices in promoting urban-rural education balance. According to **Professor Muhammad Yunus**, the Founder of Bangladesh's "Rural Bank", Nobel Peace Prize laureate, and Chairman of the AIT Yunus Center, in addition to mastering skills, students must learn how to learn. The purpose of education is to promote human growth, motivate people to strive, and integrate this spirit into the daily lives of the educated. **Professor**

Worsak Kanok Nukulchai, Executive Director of the School of Integrated Innovation at Chulalongkorn University in Thailand, former President of the Asian Institute of Technology, and Fellow of the Royal Thai Academy of Sciences, proposed to reduce the urban-rural divide by popularizing generative AI. The report by **Professor GUO Shaoqing**, Director of the Educational Informatization Strategy Research Base (Northwest) of the Ministry of Education, focused on "fairness in the process of basic education in remote rural areas". According to him, the major problems facing rural education in China are the structural shortage of teachers and the inadequate skills and knowledge of teachers. We can rely on education platforms at all levels to provide rich digital education resources for rural schools, and support small schools to carry out human-machine collaborative teaching through the collaborative application of online resources. At the same time, the coverage of the "three classes" can be expanded to promote the fairness of the course teaching process through the "delivery classes, synchronous classes and famous teacher classes".

Cultivating Talents:

The original intent and mission of developing smart education

The mission of education is to inspire wisdom and cultivate talent. The digital transformation of education poses significant challenges to educational research and practice. It is a transformation that affects every teacher and student on campus, in families and in society, and will inevitably change the lives of all of us and reshape our future.

- Smart education requires smart teachers. Improving the digital literacy and skills of teachers, as well as using digital technology to innovate teaching models, are key to the reform of the education system. "How to make teaching a fun profession is crucial for educators, technology providers and various stakeholders," said **Professor ZHAN Tao**, Director of UNESCO IITE.
- Speaking at the Forum on Teacher Digital Competences and Innovative Talent Cultivation Model, **Dr. Quentin Wodon**, Director of UNESCO IICBA, noted that many children in Africa still suffer from learning poverty, with many 10-year-olds unable to read and comprehend age-appropriate texts. The solution to this problem requires teachers to play a crucial role. Measures should be taken to make teachers' professional development more practical, and teacher training should include content such as technological literacy and digital literacy.
- **Dr. REN Youqun**, Director of the Department of Teacher Education of the Ministry of Education, delivered a keynote speech entitled "Building a Digital Empowered Teacher Team". He analyzed the new situation and problems of China's teacher training, and introduced the measures taken by the Ministry of Education to improve teacher literacy and skills through information technology. "Normal universities naturally connect basic education and higher education, playing an important role in improving people's digital literacy, deepening digital transformation in education, and building an education power.
- In recent years, Beijing Normal University has been vigorously implementing the project of improving teachers' capacity to promote the sharing of digital development achievements among the whole population," said **Professor MA Jun**, President of Beijing Normal University. In addition, he suggested continuously promoting original innovation in basic research, strengthening information sharing and resource sharing among normal universities, jointly improving the ecology of teacher training, and promoting high-quality and balanced development of education through complementary advantages.

- **Mr CUI Tinghui**, Deputy Director of the Qinghai Provincial Department of Education, shared the exploration of empowering talent cultivation through digital engines in Qinghai Province. He said, "Qinghai closely focuses on the requirements of students' development of core literacy and subject core literacy, and by seizing the favorable opportunity of the national smart education platform's provincial pilot program, they organize teachers to fully utilize the platform to carry out education, teaching, research, and training activities, fully empowering the development of learners."

A special discussion on "a new teaching and learning model that integrates information technology" was also held by experts during the conference.

- **Prof. MO Jingqi**, Deputy Director of the Department of NationalTextbook of the Ministry of Education, presented the top-level design concept of technology-enabled teaching evaluation integration, which promotes the transformation of evaluation subjects, content, methods, and results through the organic integration of teaching evaluation and modern information technology.
- According to **Mr MA Tao**, Member of Informatization Teaching Expert Committee, Teaching Committee of Basic Education of the Ministry of Education, technology will bring about resource upgrading, restructuring, and spatiotemporal expansion of teaching, thereby reshaping the teaching and learning model system.
- **Mr ZHANG Quan**, Division Chief of the Division of Teaching and Equipment Informatization, Department of Basic Education of the Ministry of Education, presented the progress of the experimental zone work of the Ministry of Education's "New Teaching and Learning Model Based on Teaching Reform and Integrating Information Technology".
- **Professor CAI Chun**, Vice President of Capital Normal University, presented the work of the university in supporting the Ministry of Education's "Experimental Zone for New Teaching and Learning Models Based on Teaching Reform and Integrating Information Technology" project.

Through extensive contacts with experts from all parties and providing in-depth professional guidance and support to various regions, Capital Normal University strives to promote the formation of a nationwide basic education curriculum reform plan and create a brand of experimental zone. Education directors, heads of research institutions, and school principals from Chongqing, Dalian, Qinghai, Guangdong, and other regions exchanged ideas on exploring new teaching and learning models in their regions and in schools.

Smart education leads to an intelligent life. How to cultivate students who are eager to learn, happy to learn and intelligent to learn, and how to cultivate a large number of innovative talents who can meet the needs of society and lead the development of the times, is one of the core issues that experts and scholars are paying attention to at the conference, and it is also the focus topic that the public is paying the most attention to. At the Forum on Information Technology-supported Innovative Comprehensive Evaluation of Students, leaders from the Department of Science, Technology and Information Technology of the Ministry of Education, experts and scholars in the field of smart education, and heads of education regulatory departments from nearly 30 pilot regions were invited to attend. They exchanged and discussed **the pilot work of the pilot area of the information technology-supported comprehensive quality assessment reform for students initiated by the Ministry of Education**.

- **Ms SHU Hua**, Deputy Director of the Department of Science, Technology, and Informatization of the Ministry of Education, believes that it is necessary to fully utilize information technology, improve the scientificity, professionalism, and objectivity of educational evaluation, and innovate evaluation tools to utilize modern information technologies such as AI and big data to explore the vertical evaluation of students' learning situation in all grades and the horizontal evaluation of all-around development of moral, intellectual, physical, aesthetics and labor education.

- According to **Mr Mark Boris Andrijanič**, former Minister of Digital Transformation in Slovenia, research shows that in the future, 70% of jobs will rely on digital technology and skills to complete. The younger generation must master the latest technologies and have a sense of social responsibility to grow from digital natives to digital leaders.
- **Professor CHEN Li** from Beijing Normal University presented the current situation and progress of information technology-supported comprehensive student quality assessment.
- **Professor ZHENG Qinhua** from Beijing Normal University stated that the comprehensive quality of students will be measured and characterized using sophisticated technology through multiple data collection, processing, and analysis around performance evaluation.
- **Professor XIN Tao** from Beijing Normal University shared his thoughts on evaluation reform and the construction of comprehensive literacy theory.

Heads of education authorities from Chongqing, Changsha, Yangquan, Beijing’s Fangshan District and Foshan shared practical cases of ICT-supported reform and innovation of comprehensive student quality assessment in their regions.

To promote the growth of teachers and students in the era of intelligence and enhance digital literacy and skills, the conference held a special Teacher Forum on Innovative Practice of Smart Education and a Students Forum on Innovative Design of Future Education for teachers and students. Participants discussed teaching methods for integrating technology and subject courses, practical exploration of technology education applications, digital literacy and professional development of teachers in the information environment, learning environment design and digital transformation of learning, and excellent cases of smart education, jointly exploring innovative solutions for future education.

- **Professor YUAN Jiazheng**, Dean of the College of Science and Technology at Beijing Open University, believes that the AIGC's promotion of open education is mainly reflected in the following aspects: the transformation from traditional classrooms to intelligent classrooms; the more intelligent teaching methods, teacher roles and evaluation methods; the opportunity for teachers to access better resources; and the students to focus more on improving innovative thinking instead of passively accepting knowledge.
- **Professor XIONG Yu**, Director of AI and Smart Education Centre at Chongqing University of Posts and Telecommunications, presented the university’s insights and experiences in data governance by focusing on the research and practice of universities in the comprehensive evaluation of teaching intelligence.
- **Mr SONG Weizu**, Founder of the Beijing Design Society, called for exploring the form, direction, and needs of future education from the perspective of design thinking. Representatives of outstanding college students from 13 countries shared experiences and exchanged views based on the actual situation and personal experiences of their countries and regions.

The event held at the same time as the conference also included the final of the 6th Global Competition on Design for Future Education. Since its launch on March 1, the competition has attracted more than 1,000 college students and 2,000 primary and secondary school teachers from more than 30 countries and regions to participate. After fierce competition in the preliminary rounds and pre-finals, 20 outstanding works were selected for the finals in the group of university students and the group of primary and secondary school teachers. Gold, silver and copper awards were given.

International cooperation:

A bridge to a better future for education

AI, big data, cloud computing, VR, and other new technologies are leading people into an intelligent era of "human-machine collaboration, cross-border integration, and co-creation and sharing." In 2022, at the In 2022, at the United Nations Transforming Education Summit, UN Secretary-General António Guterres emphasized that "education must be transformed because it is in a deep crisis". The summit identified "digital learning and transformation" as one of the five key action areas and called on countries to take full advantage of digital technology to promote education reform and lifelong learning. *The Reimagining Our Futures Together: A New Social Contract for Education*, published by UNESCO, emphasizes that the development of digital technology has opened new avenues for humanity, but also poses unprecedented risks. The report calls on countries around the world to unite and reimagine their ideal future society through education reform.

In response to UNESCO's initiative to promote international exchanges in the field of education, the Ministry of Education of the People's Republic of China, in cooperation with UNESCO, has held four consecutive International Forum on Artificial Intelligence (AI) and Education since 2019. The first *World Digital Education Conference* was held in Beijing in February this year, actively promoting policy dialogue and exchanges among all parties, calling for joint efforts to eliminate digital barriers, and promoting open source, sharing, and co-construction of resources. According to H.E. Mr HUAI Jinpeng, Minister of Education, digital education should be an open and cooperative education. The digital era has brought us an efficient platform for open cooperation, and open cooperation has become a key element in promoting education reform and innovation in the new era.

The "Global Smart Education Conference" jointly organized by Beijing Normal University and UNESCO, IITE has always been committed to promoting open cooperation in global education. "Since the conference was held in 2020, it has become an important platform for international exchange and cooperation in smart education," **H.E. Mr CHEN Jie** fully affirmed the conference. "Beijing Normal University is willing to sincerely cooperate with friends from all walks of life to continuously tap the potential of technology, jointly contribute to the development of education, and promote the building of a human community with a shared future," said **Professor ZHOU Zuoyu**, Vice President of Beijing Normal University.

At the closing ceremony of the conference, NetDragon Websoft released the EDA White Paper. As an educational co-creation platform and diversified incentive system, EDA enables teachers and students to access educational resources anytime, anywhere through open resources and channels, and to create and distribute courseware, thereby participating in the co-creation and sharing of the global digital education ecosystem. "NetDragon Websoft is building an idealized form of educational innovation. It is a new-age public smart education platform that aims to utilize advanced and interesting technologies to generate massive high-quality digital education resources and serve diverse learners worldwide," said **Professor LIU Dejian**, Co-dean of the Smart Learning Institute of Beijing Normal University and Chairman of NetDragon Websoft.

On behalf of the Global Smart Education Network (GSENet), **Professor HUANG Ronghuai** released the joint research finding *Consolidating Smart Education Strategies for SDG4 - An Interdisciplinary Research Report on Digital Transformation of Education*. The report rethinks and explains the characteristics of smart education in the context of digital transformation, and analyzes digital education policies in 22 countries or regions using text analysis methods. It also analyzes the contribution of relevant indicators from four dimensions of smart education to SDG 4 development goals, based on global public datasets.

At the conference, the Global Smart Education Network (GSENet) jointly launched the initiative titled "GSENet Beijing Declaration on Smart Education Strategies". The initiative includes the following content: Governments of various countries should promote the development of smart education through three strategic leverage points: changing teaching methods, building a smart learning environment, and developing forward-looking policies; policymakers should analyze and formulate national education policies from aspects such as infrastructure, resources, curriculum, digital skills and literacy, and build a new ecosystem of smart education; all stakeholders should strengthen cooperation, accelerate the development of inclusive, equitable, and high-quality education, and establish a public service system for smart education.

"China has always believed that all countries should work together in the face of global challenges. China is willing to uphold the concept of building a human community with a shared future and work closely with the international community," said **H.E. Mr CHEN Jie**. At the same time, he also proposed three initiatives for international cooperation in the field of smart education. The first is to strengthen policy dialogue and jointly promote education reform. The second is to strengthen resource sharing to promote equitable and inclusive quality education. The third is to strengthen cooperation in capacity building to facilitate teaching reform.

British author Charles Dickens wrote at the beginning of *A Tale of Two Cities: "It was the best of times, it was the worst of times..."* As **Dr. SHAN Zhiguang** said, from the perspective of the digital transformation of education and the flourishing development of smart education, this is the best of times; but from the perspective of the differentiation of global educational concepts and the confusion of educational paths, this is the worst of times. It can be said that this is the best of times for those who actively adapt to and take advantage of the situation, while this is the worst of times for those who are stubborn and complacent. We must fully recognize that smart education is an irreversible trend, a necessity for social development, and an inevitable evolution of education itself. It coincides with the Fourth Industrial Revolution and synchronizes with the transformation of human society. It will be guided by humanistic ideas and driven by technological empowerment, leading the new development of education.

True heroes arise in times of hardship. Against the backdrop of the rising tide of smart education, this generation of educators should keep pace with the times, boldly shoulder great responsibilities, and strive to be the trendsetters of the times. At the same time, due to the long and arduous road of smart education, we must overcome difficulties and work together to explore new horizons in smart education.

Finally, we are pleased to announce that the Global Smart Education Conference 2024 will be held on August 18th - 20th, 2024. We are already looking forward to next year together, and having the opportunity to connect with our friends again.

*The video of GSE2023 Spotlights is available at the official website.

Introduction

To promote the digital transformation and intelligent upgrading of education, Beijing Normal University held the first "Global Smart Education Conference" in August 2020 to explore the development trend of future education. Until today, we have held four editions of the "Global Smart Education Conference", aiming to discuss the development direction and practice path of education reform in the intelligent era.

The Global Smart Education Conference 2020 was held on August 20-22 with the theme of *AI and Futures of Education*. It aimed to further understand the latest achievements and development trends in smart education, fully grasp the influences of AI on the futures of education, and discuss the factors, features, plans, and potential problems in ICT-driven educational development.

With a focus on identifying the promise of futures of education, the Global Smart Education Conference 2021 was held on August 18-20, 2021, with the theme of *Smart Learning and Futures of Education*. The plural form of "Futures" emphasized multiple dimensions of the future and appealed to reimagine how education and knowledge shall shape the future of humanity in a context of complexity, uncertainty, and precarity.

The Global Smart Education Conference 2022 was held on August 18-20, exploring the theme *Intelligent Technology and Digital Transformation in Education*. It emphasized how intelligent technologies empower smart education, digital transformation in regional and rural education, the futures of education in the eyes of teachers and students, how digital governance of education can be enhanced to direct intelligent technologies to the common good for education and humanity.

Held on 18-20 August 2023, this Global Smart Education Conference 2023, which is the focus of this report, involved 300 speakers from 40 countries, including experts from international organizations, academic institutions, and private sectors. The conference included 16 thematic forums and released International research outcomes. This series of forums has aimed to become a sustainable platform to promote knowledge sharing and the achievement of international agreements in the field of smart education.

Smart Education: The Goal of the Digital Transformation of Education

As the new round of technological revolution and industrial transformation deepens, digital technology is increasingly becoming a driving force that fundamentally transforms human social thinking, organizational structures, and operational models. It not only provides significant opportunities for innovating pathways, reshaping forms, and promoting development but also brings new challenges. "What is education and its way forward?" has become a topic of collective consideration for countries worldwide. The United Nations Education Transformation Summit pointed out that global education faces severe challenges and a learning crisis. Therefore, it is urgent to promote educational transformation and fully tap into the power of the digital revolution to ensure that quality education and lifelong learning are provided as a common interest and a human right for all, with particular attention to the most marginalized groups. China has set the goal of promoting educational digitalization and building a society and country where everyone pursues lifelong learning. The digital transformation of education is a systematic planning process carried out at the strategic level, implementing a comprehensive digitalization process across all elements, processes, businesses, and fields within the education system, expanding the coverage of "education for all," widening the spatial scope of "learning anywhere," and extending the temporal scale of "learning anytime." This will create a learning society that meets the demands of lifelong learning for all and is open, flexible, and sustainable. As the desired form of the digital transformation of education, smart education is an educational behavior (system) provided by schools, regions, or countries that offer high learning experiences, high adaptability of content, and high teaching efficiency. It leverages modern science and technology to provide a range of differentiated support and on-demand services to students, teachers, parents, and others. Furthermore, it comprehensively collects and utilizes data on the status of participant groups and educational processes to promote fairness, continuous performance improvement, and the cultivation of educational excellence. The key to promoting the digitalization of education and developing innovative smart education lies in fostering digital thinking within the education system, strengthening digital support capabilities, developing high-quality digital learning content, and constructing a digital learning public service system for the entire population.

Cultivating Talents: The Central Focus of Smart Education

Education's original intention and mission are to enlighten people's wisdom and cultivate outstanding individuals. This is also the primary task and fundamental goal of smart education. The development of the times and the advancement of technology drive the changes in talent development goals and talent structures, prompting education to adapt and adjust accordingly. Smart education is a new form of education in the digital age. Smart education embodies "wisdom" emanating from teachers. Intelligent education represents "intelligence" empowered by the environment. The futures of education embodies the "transformation" of education forms. The new teaching models enlighten students' wisdom, have surpassed the formal learning provided by schools, and moved towards integrating formal and informal learning. The diversity of students and individual differences are given due attention, allowing the realization of a “learner-centred" educational philosophy. A smart learning environment is a place or space for learning that can perceive learning situations, identify learner characteristics, provide appropriate learning resources and convenient interactive tools, automatically record learning processes, and evaluate learning outcomes to promote effective learning. The modern education system nurtures human intelligence, and artificial intelligence and big data will play a crucial role in its evolution. They will provide reform proposals and decision-making foundations for national education, school management, teaching, and talent development systems, ultimately enhancing the quality of talent cultivation.

Technology Empowerment: The Driving Force Behind Innovative Development in Smart Education

With the continuous upgrading of the intelligent technology ecosystem, such as generative artificial intelligence, big data, the Internet of Things, and mobile communication, the fields of technology and education are actively permeating each other. Technology empowers education, while education adds value to technology. Education holds a fundamental, pioneering, and comprehensive position and role that empower, store, and enhance national competitiveness. Education is one of the practical fields of technology. The driving force of technological innovation contributes to and supports the high-quality development of education. The continuous upgrading of the intelligent technology ecosystem will serve students' adaptive growth, support teachers' professional development, and facilitate the advanced enhancement of smart learning environments. The increasing demand for quality education will be the natural driving force behind technological development. The mutual empowerment of technology and education will promote cross-domain integration, realize the integration and innovation of data, information, business, applications, and services, and enhance educational intelligence. As a result, learners will experience high satisfaction and enjoyment in receiving smart education services.

Data Governance: The Systematic Approach Driving the Orderly Advancement of Educational System Reform

As a new production factor, data is the foundation for digitalization, networking, and intelligence, profoundly transforming production methods, lifestyles, and social governance. "Presenting with data, deciding with data, managing with data, living with data" constitutes the fundamental mindset for the digital transformation of education. The development of smart education not only accumulates high-quality resources but also generates massive data treasures. Educational big data provides objective evidence and fresh perspectives for optimizing educational policies, innovating teaching models, and transforming educational measurement and evaluation methods.

The transformative power of data elements in education relies on necessary external conditions. It requires accelerating the improvement of the education data element market, emphasizing the security and ethical issues in data application, establishing a classification, grading, and authorization system, and focusing on enhancing educational data governance capabilities and user data literacy. This approach drives the balanced allocation of educational resources, precise teaching, educational evaluation reform, and digitized governance by leveraging data.

The shift from "extensive management based on experience" to "intensive governance relying on data analysis" calls for a new model of data-driven educational governance. This entails building an education data brain, establishing secure and convenient data exchange channels, enhancing the perception, interconnection, computation, and processing capabilities of education data, promoting the orderly flow of educational data, realizing cross-regional, cross-level, and cross-departmental data sharing, supporting scientific decision-making, driving the reengineering of management business processes, achieving joint operations between internal and external school affairs, streamlining education services into a one-stop process, and improving the efficiency and quality of management services.

Global Smart Education Network (GSENet): The International Platform for Collaboration and Exchange

To collectively address global learning crises and educational challenges and to further unlock the immense possibilities of integrating technology and education, Beijing Normal University (BNU), in collaboration with the UNESCO Institute for Information Technologies in Education (UNESCO-IITE), the Arab League Educational, Cultural, and Scientific Organization (ALECSO), the Commonwealth of Learning (COL), the International Society for Technology in Education (ISTE), and the Southeast Asian Ministers of Education Organization (SEAMEO), have jointly initiated the "Global Smart Education Network (GSENet)." The aim is to establish a partnership comprising researchers, practitioners, technology experts, and policymakers, to support the rethinking and redesign of education systems at the national, regional, and school levels. This initiative seeks to formulate strategic solutions and approaches to reshape and innovate education and establish an equitable, inclusive, and high-quality smart education system that caters to individuals' diverse and personalized needs in the future world.

Forum Structure

The Global Smart Education Conference 2023 was structured around 16 thematic forums. Three events were held at the same time, inlcuding *The 6th Global Competition on Design for Future Education*, *TVET Leadership and Management Benchmarking Programme* and *Smart Education Exhibition*.

Opening Ceremony

& Forum on Educational Digitalization and Lifelong Learning

- Forum on Data Governance and Cognitive Development
- Forum on Educational Digitalization Strategy and Policy Planning
- Forum on Generative Artificial Intelligence and Futures of Education
- International Forum on Generative AI Large Models and Psychological Assessment

- Forum on the New Ecology of Regional Smart Education (Director Forum)
- Forum on the Digital Transformation of Regional Education (Director Forum)
- Teacher Forum on Innovative Practice of Smart Education
- Student Forum on Design for Future Education

- Forum on Digital Campus and Intelligent Educational Equipment (Learning Environment)
- Forum on New Teaching and Learning Model Integrating Information Technology (Teaching Model)
- Forum on Information Technology-supported Innovative Comprehensive Evaluation of Students (Evaluation Reform)

- Forum on Teacher Digital Competences and Innovative Talent Cultivation Model (Teacher Education)
- Forum on Youth Skills Development and Digital Transformation (Vocational Education)
- Forum on Smart Village and Rural Education Transformation (Rural Education)

Forum on Technology-Empowered Educational Transformation

& Closing Ceremony

- **Forum on Educational Digitalization and Lifelong Learning**

  This forum highlighted the issues on the digitalization process of the entire education system, including all elements, processes, businesses, and fields; the digital foundation and public service system for a learning society; the transformative pathways and cooperative mechanisms for promoting digital transformation in lifelong learning; national strategies for smart education.

- **Forum on Data Governance and Cognitive Development**

  This forum highlighted the issues on new policies and trends in data governance; intelligent algorithm design; cognitive development assessment; methods and case studies of social experimentation in education.

- **Forum on Educational Digitalization Strategy and Policy Planning**

  This forum highlighted the issues on addressing learning crises and educational challenges; policy planning and roadmaps for educational digitalization; development of educational think tanks in the digital age.

- **Forum on Generative Artificial Intelligence and Futures of Education**

  This forum highlighted the issues on opportunities and challenges of the generative artificial intelligence in education; reshaping education through artificial intelligence; human-machine collaborative teaching; ethical applications of artificial intelligence in education.

- **International Forum on Generative AI Large Models and Psychological Assessment**

  This forum highlighted the issues on generative AI Large Models compared to human abilities; generative AI Large Models based psychological assessment; generative AI Large Models and emotional perception.

- **Forum on New Ecology of Regional Smart Education**

  This forum highlighted the issues on theconnotation and characteristics of smart education; construction features of smart education demonstration zones; smart learning environments; public service systems for smart education; mechanisms for sustainable development of regional smart education; assessment of the development of smart education.

- **Forum on Digital Transformation of Regional Education**

  This forum highlighted the issues on the implementation plan for digital transformation of education; construction and application of smart education platform; big data application in education; artificial intelligence-supported construction of teachers’ team; new teaching and learning model integrating information technology; collaborative innovation mechanism for education digitalization.

- **Teacher Forum on Innovative Practice of Smart Education**

  This forum highlighted the issues on the teaching methods of the integration of technology and subject courses; practice and exploration of the application of technology education; teachers’ professional development in the informationized environment.

- **Student Forum on Innovative Design for Future Education**

  This forum highlighted the issues on the creative solution design for future campuses, intelligent learning spaces, virtual teachers, etc.; smart learning methods; excellent works of the Global Competition on Design for Future Education.

- **Forum on Digital Campus and Intelligent Educational Equipment**

  This forum highlighted the issues on theconstruction standards and application of digital campus; intelligent education equipment and technical solutions; assessment of intelligent education products; industry-university-research collaborative innovation.

- **Forum on New Teaching and Learning Model Integrating Information Technology**

  This forum highlighted the issues on the curriculum construction under the background of digital transformation of education; normalized application of deep integration of information technology in teaching; technology empowered evaluation and homework reform.

- **Information Technology-supported Innovative Comprehensive Evaluation of Students**

  This forum highlighted the issues on theories, models, and indicator systems for comprehensive quality evaluation of students; performance evaluation technology supported by multimodal data; data-driven reform and innovation of regional comprehensive quality evaluation of students.

- **Forum on Teacher Digital Competences and Innovative Talent Cultivation Model**

  This forum highlighted the issues on the definition, development and assessment of digital literacy and skills; selection criteria and methods, training models, and evaluation systems for innovative talents; characteristics and growth patterns of digital generation students; education informatization leadership; smart campus and new form of future school.

- **Forum on Youth Skills Development and Digital Transformation**

  This forum highlighted the issues on the integration of job position, curriculum system, vocational skills competition and vocational skill certificate to cultivate skillful youth talents; construction of digital campuses for vocational education; teacher workforce development for industry-education integration; development of digital courses and reforms in teaching methods; TVET Leadership Benchmarking Program.

- **Forum on Smart Village and Rural Education Transformation**

  This forum highlighted the issues on the rural education revitalization and revitalizing rural areas through education; opportunities and challenges of digital transformation in rural education; teacher workforce development in rural areas; online and distance education in rural areas.

- **Forum on Technology-Empowered Educational Transformation**

  This forum highlighted the issues on the research achievements of major scientific and technological projects in the field of smart education; pathways for mutual empowerment of technology and education; application scenarios and development trends of intelligent technology in education.

Opening Ceremony

Advancing the strategic action of educational digitalization to develop smart education through innovation

The digital transformation of education is systematically planned from the strategic level, implementing the digitalization process of all factors, all processes, all services, and all fields in the education system. Smart education is its target form. The UN Transforming Education Summit indicated that the power of digital transformation must be fully harnessed to ensure that quality education and lifelong learning are made available to all as a common good. The Chinese government has proposed to promote educational digitalization and build a society and country of learning where lifelong learning is pursued by all.

H.E. Mr CHEN Jie, Vice Minister of Education, P.R.China and Chairperson of National Commission of the People's Republic of China for UNESCO, delivered an opening remarks. He said that as a new form of education in the digital age, smart education is an inevitable choice for us to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. In recent years, AI technology has developed rapidly, demonstrating its increasingly broad application in education. Since AI technology and digital transformation of education are in the ascendant, data governance has become a topic that we must pay great attention to and address. The Chinese government has always given priority to education in social and economic development, attached great importance to the key role of digitalization in driving educational reform, and formulated a

SPEAKERS

H.E. Mr CHEN Jie
Vice Minister of Education, P.R.China
Chairperson, National Commission of the People's Republic of China for UNESCO

H.E. Mrs Leela Devi Dookun-Luchoomun
Vice Prime Minister, Mauritius
Minister of Education, Tertiary Education, Science and Technology, Mauritius

H.E. Mr Azat Atayev
Deputy Minister of Education,Turkmenistan

Prof. MA Jun
President, Beijing Normal University, China

Prof. ZHAO Qinping
Academician of Chinese Academy of Engineering

Mr Mahmoud Zouaoui
Chief of the Staff, Ministry of Higher Education and Scientific Research, Tunisia

Prof. CHEN Li
Director, Technical Committee of National Engineering Laboratory of Cyberlearning and Intelligent Technology

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MODERATOR

Prof. ZHOU Zuoyu
Vice President, Beijing Normal University, China

national strategy for the development of educational digitalization. Our ongoing efforts in implementing the strategic action of educational digitalization have been rewarded with tangible results. The Chinese government has strengthened infrastructure construction, established a high-quality support system for educational digitalization, and built a national smart education platform to expand the supply of quality educational resources. In addition, more effort is being made to vigorously promote the deep integration of digitalization with educational and teaching reform, create a new form of modern education, and actively carry out international cooperation in digital education. **He put forward three proposals:**

- **Strengthening Policy Dialogue for Collaborative Education Transformation.** The development of smart education represents a significant endeavor in education reform, requiring substantial investment and exerting far-reaching impacts. It necessitates systematic planning, scientific strategies, and effective policy measures. Therefore, it is imperative for nations to engage in strategic dialogues and exchanges on pertinent issues, drawing inspiration from one another. China is committed to collaborating with governments and international organizations worldwide to establish platforms for policy dialogue and exchange. Through these platforms, we aim to foster in-depth discussions on new concepts, strategies, as well as policy matters pertaining to smart education, including planning, standards, data governance, security, and ethics. Our shared objective is to collectively explore a scientifically sound path and effective policies for the development of smart education.

- **Enhancing Resource Sharing to Promote Equity and Inclusion.** The advancement of digital transformation in education hinges on harnessing digital technologies to foster inclusivity and equity in education while preventing the emergence of digital divides. The fundamental approach is to leverage digital technology to facilitate the sharing of high-quality educational resources. We advocate for the principles of mutual consultation, co-construction, and shared benefits to construct a digitalized education resource public service platform, serving lifelong learning for all. Taking the recent recognition of our national smart education platform by UNESCO for its educational information technology excellence as an opportunity, China is committed to actively expanding educational resources in multiple languages, broadening international sharing. China is eager to deepen collaboration with other countries to collectively encourage more nations and individuals to participate in the development of high-quality educational resources, thereby ensuring that smart education benefits everyone.

- **Strengthening Capacity Building Cooperation to Drive Pedagogical Transformation.** The crux of developing smart education lies in pedagogical transformation, with the pivotal factor being the enhancement of teachers' proficiency in using digital technology for instruction. We propose further expansion of international cooperation in building teachers' capacity for smart education. This involves assisting teachers in grasping the essential principles of smart education and mastering critical digital teaching skills. Simultaneously, we aim to establish platforms and channels for inter-country teacher exchanges, collaboration on educational research, and curriculum development. China encourages teachers to engage in international exchanges and cooperation in teaching and research. We support and actively contribute to the establishment of relevant second-tier centers in collaboration with UNESCO, focusing on enhancing international cooperation in teacher capacity building.

Professor ZHAO Qinping, Academician of the Chinese Academy of Engineering, emphasized that education transformation must rely on scientific and technological means, and that data governance would be a crucial part of this. In the era of intelligence, learners expected a more flexible, ubiquitous and networked environment of smart learning to realize cooperative and inquiry-based "real" learning by combining virtuality and reality. He argued that we are making the leap from VR 1.0 to 2.0, and that VR would increase the characteristics of intelligence, interoperability and evolution on the basis of immersion, interactivity and conceivability. The virtual-real connected objects of "ubiquitous networking" will be extended to the digital twins of physical objects, human avatars and digital native objects, opening up a road of hope for the shared survival and free shuttle of human beings in the physical world and the digital world. In the future, VR 2.0 will be integrated into a new-generation learning environment to better help learners learn more easily and effectively and be better invested.

Professor MA Jun, President of Beijing Normal University, pointed out that normal universities naturally connected basic education and higher education, and played a pivotal role in improving people's digital literacy, deepening the digital transformation of education, and building an education power. As the earliest modern institution of higher education for teachers in China, and the leading normal university in teacher education, Beijing Normal University has actively implemented the demonstration project for educational digitalization strategy in recent years, carried out the "Internet + Education" reform and innovation action plan, and vigorously enforced the project to build a stronger teacher force, in an effort to facilitate the sharing among all of the fruits of digital development. He proposed to continuously promote the original innovation in basic research, and the ecological upgrading of intellectual technology, effectively serving the modernization of education. Normal universities are expected to enhance information commonality and resource sharing, improve the ecosystem of teacher education through complementary advantages, and accelerate the quality and balanced development of education. We must do more to allow diverse learners to improve their knowledge and understanding in the broad digital space, develop their thinking and skills, learn communication and collaboration, and become truly usable talents for the future.

Tackling the learning crisis together to drive educational reform

Strengthening international dialogue and cooperation in terms of digital education is conducive to pooling the efforts of all countries to jointly address global education challenges and learning crises, promote educational transformation and innovation, and enable more people to benefit from the development of digital education.

H.E. Mrs Leela Devi Dookun-Luchoomun, Vice Prime Minister, Minister of Education, Tertiary Education, Science and Technology of Mauritius, pointed out that the current inequality gap remains wide in the countries of the Southern Hemisphere, particularly in sub-Saharan Africa. The digital divide has become a tangible barrier. She stressed that human well-being should consistently be at the center of concern in digital transformation, and human intelligence and AI should coexist harmoniously and help each other forward. She described the initiatives of Mauritius in promoting lifelong learning through technology and called for international cooperation at the technical level to strengthen technology-enabled lifelong learning, thereby providing a strong guarantee for sustained economic growth, employment opportunities and social welfare.

H.E. Mr Azat Atayev, Deputy Minister of Education of Turkmenistan, presented his country's efforts in boosting the development of digital education. In cooperation with UNESCO IITE, Beijing Normal University and other institutions, Turkmenistan has developed a "strategy for the development of digital education" and is striving to drive educational reform through new initiatives such as the introduction of normative legislation, the building of an e-learning platform, the use of teaching methods incorporating new technologies, and the application of data analytics to support educational decision-making. He suggested that emphasis be placed on the identification and discovery of the structure and clustering of educational data, on the network analysis of "digital footprint" and the analysis of educational data in personal digital files, and on the prediction of intellectual development based on comprehensive education and human development data.

Mr Mahmoud Zouaoui, Chief of the Staff of the Tunisian Ministry of Higher Education and Scientific Research, presented the digital platform projects and educational information systems in higher education in his country. These new initiatives can enable researchers, teachers, and students to better utilize technology for learning, use resources efficiently, and narrow the digital divide, while even helping policymakers and teachers make scientific decisions, improve the quality of education, and facilitate the development of smart education. He pinpointed that we must be fully aware of the risks of privacy protection, information security and network abuse in the digital transformation of education, and students' learning experience should be enhanced by strengthening infrastructure development and multi-party collaboration to ensure equitable and safe education.

Outcome Release: Fundamental Theoretical Innovations of Internet-driven Educational Transformation

Professor CHEN Li, Director of the Technical Committee of National Engineering Research Centre of Cyberlearning and Intelligent Technology and Professor of Beijing Normal University, released the "Innovative Achievement of the Basic Theory of Internet + Education". The achievement is rooted in the first-mover advantage and practical soil of Internet education in China, and attempts to answer three major theoretical questions during the implementation of the national "Internet + Education" strategy: first, it explains the basic principles of the Internet to promote the educational reform, including the transformation role of the Internet, the connotation and extension of "Internet + Education" and the focus on promoting the innovative development of "Internet + Education"; second, the achievement creatively puts forward the philosophical thought of "Internet + Education", including the ontology, epistemology, methodology and world outlook of "Internet + Education"; third, it reveals the teaching law of "Internet + Education", including learners' self-organization, the emergence of knowledge and the nonlinear relationship between teaching and learning. This achievement is the first all-round, multi-angle and systematic research result on the basic theory of "Internet + Education" in China, which will provide important theoretical support for the implementation of the national "Internet + Education" strategy. During the conference, important achievements in smart education, AI and future education development will also be

Prof. ZHOU Zuoyu, Vice President of Beijing Normal University, was the moderator of Opening Speeches. He stated that digital technology has increasingly become an important leading force driving fundamental changes, providing new and major opportunities for us to innovate paths, reshape forms, and promote development, as well as new challenges.

*The Opening Ceremony is hosted by BNU and UNESCO IITE. For more information, the video is available at https://wx.vzan.com/live/page/419308241.

2023全球智慧教育大会
Global Smart Education Conference 2023
The Annual Conference of GSENet
教育转型 与 数据治理
Education Transformation and Data Governance
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Global Smart Education Conference

Group Photo of Guests at Opening Ceremony

Photo at Opening Ceremony

Forum on Educational Digitalization and Lifelong Learning

Focusing on the core proposition of talent training to drive the digital transformation of lifelong learning

Professor LV Jian, Academician of the Chinese Academy of Sciences, delivered a report entitled "Reflection and Practice on the New System of Talent Cultivation in the New Era". Proceeding from the international trend and the new historical orientation of China's social development, he focused on talent training and the mission of universities, and proposed that educators should integrate and unify the way of educating people, the way of the Great Learning, and the way of the times. He shared the practical experience of Nanjing University in providing core support for high-quality talent training with high-level disciplines, strengthening the meta-capacity building of the disciplinary ecosystem, and creating a problem-oriented integrated model system of undergraduate, postgraduate and doctoral studies.

Professor Asha S. Kanwar, President and CEO of the Commonwealth of Learning (COL), noted that the 21st century belongs to lifelong learners, and the UN Sustainable Development Goal 4 aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all by 2030. She argued that smart education should be pleasant, engaging, efficient, effective and moral. Noting that climate disasters are likely to be the biggest disruption to education over the next decade, she said smart education must be meaningful and give people the opportunity to make a living, where the most vulnerable and marginalized groups in society could gain access to technology. Smart education must be stakeholder-oriented

SPEAKERS

Prof. LV Jian
Academician of the Chinese Academy of Sciences

Prof. Asha S. Kanwar
President & CEO, COL

Prof. ZHANG Jun
Academician of the Chinese Academy of Engineering

Dr. Martín Benavides
Director, UNESCO IIEP

Prof. CHEN Xiaohong
Academician of the Chinese Academy of Engineering

Dr. Quentin Wodon
Director, UNESCO IICBA

Mr Mohamed Ould Amar
Director General, ALECSO

MODERATOR

Prof. ZHAN Tao
Director, UNESCO IITE

and prepared for any future disaster or shock. Above all, smart learning should be transformative to develop independent thinkers. She stressed that lifelong learning was not just a course or a teaching program, but to be integrated into all aspects of human life, including social culture, policy and planning. A learning culture should be established through the ongoing enhancement of skills and knowledge and the cultivation of values.

Professor ZHANG Jun, Academician of the Chinese Academy of Engineering, shared a new understanding of green education in his report entitled "Green Education Drives the High-quality Development of Education". He pointed out that green education, driven by such technologies as data acquisition, knowledge graph, metaverse, and large language model (LLM), realized thorough perception of education through the data acquisition of teaching resources, performance status and teaching effect. To achieve knowledge-driven smart education, fragmented knowledge shall be integrated into systematic knowledge, which shall be summarized and innovated; the immersive, interactive, scene-based and game-oriented curriculum contents shall be designed to promote the immersion and expansion of smart education; finally, for innovative learning of smart education, the multiple learning paths shall be designed and the innovative models shall be developed. In addition, he introduced the "Huanyu + (iSPACE+X) Greening Education Comprehensive System" created by the Beijing Institute of Technology. This system focuses on innovation in ideological value, cultivating model and top-level design of professional systems to train top-notch innovative talent to keep up with the times.

How does digital technology empower education transformation? According to **Dr. Martín Benavides**, Director of UNESCO IIEP, as a key component of education transformation, responsible technology is essential to ensure the successful application of education transformation. The technology shall be integrated into a broader government strategy to effectively address the continuing educational challenges. The planning and management ability of the education system shall be improved to enhance the digital ability of students, educators and all participants in the education system. In this way, they can successfully responsibly interact with technology.

Professor CHEN Xiaohong, Academician of the Chinese Academy of Engineering, gave a keynote speech entitled "A New Paradigm of Talent Training in the Age of Digital Intelligence". She pointed out that in the age of digital intelligence, talent cultivation in colleges and universities shall follow five major transformations: transforming from traditional thinking patterns to digital intelligence thinking, from specialized discipline to cross disciplines, from theoretical research to innovative practice, from traditional evaluation standards to comprehensive evaluation standards, and achieving deep integration of science and art & humanity. In her view, to solve the challenge of digital intelligence technology and cultivate talents suitable for the new era, colleges and universities shall develop innovative and compound talents with practical application capacity using multidisciplinary and innovative education. She briefed on the education process of Hunan University of Technology and Business, which, adhering to the philosophy of integrated development of "New Engineering + New Business + New Liberal Arts", accelerates the innovation of teaching space, teaching mode, teaching resources and teaching evaluation, to cultivate innovative and compound talents with entrepreneurial spirit and application ability.

Dr. Quentin Wodon, Director of UNESCO IICBA, described via video the digital learning platforms for African teachers and their skills development. He pointed out that human capital is an important wealth of national education. However, many children over the age of 10 in Africa lack basic literacy skills, resulting in a severe education crisis. To change this situation, relevant authorities should not only provide schools with ICT equipment such as computers, but also improve teachers' digital skills to better their ability to use resources. To strengthen teachers' teaching ability and assist them in integrating information technology with education and teaching, relevant government departments should provide teachers with free-of-charge internet access with the help of infrastructure construction and carry out pre-and post-service teacher training.

Mr Mohamed Ould Amar, Director General of ALECSO, pointed out via video, that ALECSO has fully realized the great energy of science and technology in educational transformation. He also believed that the adoption of ICT to develop education in Arab countries should be a priority. To successfully implement AI and education-related projects, ALECSO held Arab Code Week to promote the culture of programming sciences, verified the credibility of university degree certificates using blockchain technology, and enabled the young generation to enter the world of the Metaverse and NFTs through the ALECSO NFT education platform. To improve learners' survival and development in a knowledge-based society, ALECSO will expand and deepen future exchange and cooperation with international organizations, regional organizations, colleges and universities, and scientific research institutions.

Prof. ZHAN Tao, Director of UNESCO IITE, was the moderator of this forum. He said this conference, which combines both in-person and online components, reflects our recognition of the diverse demands posed by the realms of real-world, online, and virtual education within the context of smart education.

*The Forum on Educational Digitalization and Lifelong Learning is hosted by BNU and UNESCO IITE. For more information, the video is available at https://wx.vzan.com/live/page/419308241.

Forum on Educational Digitalization and Lifelong Learning

Key takeaways

- Smart education is a broader concept than online learning; Smart education is a comprehensive approach that integrates technology, data analytics, innovative teaching, social inclusion and environmental conservation for a more effective and engaging experience; Smart education goes beyond formal learning to include non-formal and informal learning.

- Digital technology can be used to empower educational planning and management. When implemented at a system level, technology can streamline processes and improve the efficiency of institutions. It allows us to: Plan and manage education systems more efficiently by strengthening and scaling EMIS in the collection, integration, processing, maintenance and dissemination of data to assist decision-making; Increase transparency by facilitating open access to relevant information and allowing the construction of participatory systems where stakeholders can engage in the formulation of public policy.

- Considering that ICTs are a fundamental pillar of smart learning, ALECSO has been implementing major pioneering projects in the field of artificial intelligence (AI) and its applications in education, with the primary focus of using this technology to help the Arab world face the major challenges in this field, to innovate educational practices and learning, and to accelerate progress towards achieving SDG4 by addressing the current forms of inequality in terms of access to knowledge, research, and the diversity of cultural expression, and reducing the technological gaps within and between Arab countries.

- In the era of artificial intelligence, it is crucial that we accurately understand the reasonable range in which AI, represented by ChatGPT, can play a role. We must approach AI, exemplified by ChatGPT, as a double-edged sword that is continually evolving and advancing the reform and reshaping of the education system in the new tripartite world of human-machine-object fusion with caution and rationality.

- In the realm of immersive innovation, the educational metaverse harnesses various sensory devices, wearable technology, and more to offer students entirely new means of immersive perception, including visual, auditory, and tactile sensations. As the sensitivity, battery life, and rendering capabilities of these devices have significantly improved, students' experiences in the educational metaverse are approaching parity with the real world. The heightened realism makes it easier for teachers to introduce course backgrounds and explain knowledge concepts from various angles, enabling students to feel truly present and transforming the focal elements of their attention.

- In the age of data intelligence, the framework for talent cultivation should be oriented towards the goal of nurturing innovative, applied, and versatile talents. Our educational philosophy should revolve around "cultivating culture, promoting integration, building foundations, enhancing perspectives, facilitating interaction, and providing ecological support." Ultimately, our guiding direction for technological innovation and talent development should encompass "intelligence, creativity, emotional well-being, social interaction, and spiritual communication."

Forum on Data Governance and Cognitive Development

In recent years, as we witness the rapid development of artificial intelligence technology layered upon the digitization of education, data has emerged as the central element. An increasing proportion of learning is happening within the online environment, making the acquisition of real data, scientific algorithm design, efficient utilization of computing power networks, and the implementation of diverse and effective governance pivotal to the transformation of digital education.

数据治理与认知发展论坛
Forum on Data Governance and Cognitive Development
全球智慧教育大会
Global Smart Education Conference

Group Photo of Guests from Forum on Data Governance and Cognitive Development

Mr LEI Chaozi, Director General of the Department of Science, Technology and Informatization, the Ministry of Education, expounded the significance of data governance from the perspective of strengthening the country through education, and introduced the practical exploration of data governance in China. He said: "we will establish a full-lifecycle data security governance system, improve the data security classification and grading system, refine the data permission management mechanism, and enhance the data security awareness of users." The Chinese government will continue to deeply implement the national educational digitalization strategy, and promote the reform and innovation of education through the development and application of educational big data.

Ms WANG Xiaoli, Deputy Secretary of the Party Committee of the China Academy of Information and Communications Technology (CAICT), remarked that CAICT and Beijing Normal University have established a robust collaborative foundation through their joint involvement in the Ministry of Science and Technology's Special Project on Social Governance and the National Key Research and Development Program. They are also jointly implementing the 5G+ Smart Education pilot project. Leveraging their strengths in technological research and development as

SPEAKERS

Mr LEI Chaozi
Director, Department of Science, Technology and Informatization, Ministry of Education, P.R.China

Ms WANG Xiaoli
Deputy Party Secretary, China Academy of Information and Communications Technology, China

Mr LIU Ting
Vice President, Harbin Institute of Technology, China

Prof. Mammo Muchie
Fellow at Academy of Science of South Africa

Prof. TANG Yayang
Secretary of the Party Committee, Hunan University of Science and Technology, China

Dr. TONG Lili
Deputy Director, Educational Informatization Strategy Research Base (Beijing), Ministry of Education, P.R.China

Ms MENG Ying
Director, Longhua Education Bureau, Shenzhen City, Guangdong Province, China

Ms MIAO Yaqin
Deputy Director, Changsha Municipal Education Bureau, Hunan Province, China

Dr. LI Renliang
Assistant Professor, National Institute of Development Administration, Thailand

Prof. Yashwantrao Ramma
School of Science & Mathematics, Mauritius Institute of Education, Mauritius

Ms HUANG Xiaoting
Division Chief, Office of Academic Research, Guangzhou Municipal Education Bureau, Guangdong Province, China

Mr HUANG Weilong
Vice Dean, Luohu Institute of Education Sciences, Shenzhen, Guangdong Province, China

Dr. XIE Tao
Associate Professor, School of Educational Technology, Faculty of Education, Southwest University, China

Ms WANG Xiuming
Teacher, Primary School Affiliated to Beijing Institute of Technology, China

Mr SHENG Chengbin
Principal, Ninth Primary School,
Qitaihe City, Heilongjiang Province, China

MODERATORS

Prof. CHEN Guangju
Vice Director, School Affairs Committee, Beijing Normal University, China

Mr LEI Mingyu
Senior Engineer, China Academy of Information and Communications Technology, China

well as industrial integration, CAICT will advance efforts in the technological and standardization aspects of digital educational governance, thereby contributing to the enhancement of cognitive skills and talent cultivation in the education sector.

Professor LIU Ting, Vice President of the Harbin Institute of Technology, used ChatGPT as an example to discuss AI large models and their applications. He mentioned, "ChatGPT may be the first and only significant invention in human history that cannot articulate its precise principles." According to him, "ChatGPT represents an emergence of intelligence, achieving breakthroughs in online memory of massive information, conversational understanding for various tasks, complex logical reasoning, text generation, and real-time learning and evolution. The high degree of realism in the environment makes it easier for teachers to present course backgrounds and articulate knowledge concepts from different perspectives, enabling an immersive learning experience and transforming the focus of attention."

Professor Mammo Muchie, fellow at the Academy of Sciences of South Africa, discussed the intelligent implementation of digital higher education and AI in the Forum on China-Africa Cooperation Dakar Action Plan. He called for international cooperation in building a peaceful, secure, open, cooperative, and orderly cyberspace and a cyberspace community of shared destiny.

Professor TANG Yayang, Secretary of the Party Committee of Hunan University of Science and Technology, China, elaborated on the national primary and secondary school smart education platform's performance over the past year. He emphasized its special role in addressing "double reduction" (reducing both students' academic burden and after-school tutoring), ensuring uninterrupted learning during school closures, promoting independent learning, facilitating teacher training, and advancing the high-quality and equitable development of education. However, he acknowledged that there is still room for improvement in terms of functionality, mechanisms, and results, and he called for collective efforts. He expressed confidence that the platform will play a significant role in promoting high-quality development in basic education and contributing to the construction of an "education powerhouse."

Dr. TONG Lili, Deputy Director of Educational Informatization Strategy Research Base (Beijing), Ministry of Education, P.R. China, presented a new path for cognitive development under the influence of Artificial Intelligence in Global Context (AIGC). She emphasized the need to strengthen fundamental research talent development, high-level talent cultivation, and high-quality technical skill development while respecting human cognitive patterns and the rules of online and offline teaching. AIGC has the potential to reduce time consumption, achieve mass production, provide intelligent guidance, broaden perspectives, and leverage technologies such as data annotation, information tracing, and algorithm diagnosis. However, it also brings certain regulatory risks.

Ms MENG Ying, Director of the Longhua Education Bureau, Shenzhen City, Guangdong Province, China, highlighted that artificial intelligence is the core driving force for promoting high-quality education and that widespread AI in education is essential for nurturing innovative talents. She emphasized the importance of actively promoting and appropriately managing the depth and breadth of the integration of AI technology and education development. Continuous improvement and optimization of AI applications in education, achieving synergy and win-win outcomes between AI and regional education, should be the focus.

Ms MIAO Yaqin, Deputy Director of the Changsha Municipal Education Bureau, Hunan Province, China, introduced the development of modern education governance in China and the path to achieving it. She discussed promoting transformation and reconstruction through top-level design, structural reshaping, and process optimization. In the future, Changsha will implement China's digital education strategy, comprehensively build a "smart education" characterized by innovative talent development, ubiquitous intelligent environments, and a humanistic, open, and collaborative ecosystem. This approach aims to continuously advance the modernization of the education governance system and capabilities.

Dr. LI Renliang, Assistant Professor at the National Institute of Development Administration, Thailand, shared insights into Smart City concepts, including smart energy, smart mobility, smart community, smart environment, smart building, smart governance, smart economy, and smart innovation. He pointed out that future trends in digital education governance in Thailand include direct degree attainment through exams, mutual recognition of credits within and between institutions, dual degrees, and the widespread use of micro-credentials.

Professor Yashwantrao Ramma, School of Science & Mathematics, Mauritius Institute of Education, Mauritius, introduced a website called myptim. The architecture of the website has three layers (biological, chemistry, physics) as well as the interaction between the stakeholders. The website puts more emphasis on the diagnostic assessment so that there is that element of feedback going from the teacher to the student and back to the teacher. The team designs carefully structured type of lessons that would engage the learners in Minds-on and hands-on tasks and finally a conclusion and summative estimates.

Outcome Release: Pure Campus APP

This forum unveiled the "Pure Campus[1] App (Operational Version)" developed independently by Beijing Normal University. Currently, it offers five service capabilities aimed at domestic basic education campuses: "Teacher Development," "Student Cultivation," "Interactive Space for Intelligent Tools," and more. This app seeks to establish a "Smart Campus" that covers early childhood education and basic education stages, serving as a "Internet + Education" public service platform. It connects thousands of campuses, including advanced smart education demonstration areas and "Three Districts and Three Prefectures," and builds an online and offline sharing mechanism in areas such as "Smart School Affairs," "Smart Classrooms," "Tool-based Learning," and "AI Paradigm." This initiative promotes the sharing of educational resources between regions and the application of artificial intelligence technology.

Roundtable Discussion

The Topic of the Roundtable Discussion is *Exploration of Assessment Pathways for Data Authenticity and Cognitive Adaptability in the Internet Environment*. Speakers include **Ms HUANG Xiaoting**, Division Chief of Office of Academic Research, Guangzhou Municipal Education Bureau, Guangdong Province, China; **Mr HUANG Weilong**, Vice Dean of Luohu Institute of Education Sciences, Shenzhen City, Guangdong Province, China; **Dr. XIE Tao**, Associate Professor, School of Educational Technology, Faculty of Education, Southwest University, China; **Ms WANG Xiuming**, Teacher at Primary School Affiliated to Beijing Institute of Technology, China; and **Mr SHENG Chengbin**, Principal of the Ninth Primary School, Qitaihe City, Heilongjiang Province, China.

*The Forum on Data Governance and Cognitive Development is hosted by Educational Informatization Strategy Research Base (Beijing), Ministry of Education of P.R.China, CAICT, Longhua Education Bureau, China, WBBA; and partner with China-Africa Leadership Development Institute, Tsinghua University (CALDI-THU), and iFLYTEK. For more information, the video is available at https://wx.vzan.com/live/page/1589526055.

Forum on Data Governance and Cognitive Development

Key takeaways

- As a new production factor, data is the foundation for digitalization, networking, and intelligence, profoundly transforming production methods, lifestyles, and social governance. Data Governance is a systematic approach driving the orderly advancement of educational system reform.

- As a technological pathway to modernize the education governance system and governance capabilities, digital technology should be fully leveraged to shift education from "management" to "data-driven governance" and from "closed" to "open." Governance methods should transition from "broad" to "precise" and from "single" to "diverse," while governance efficiency should evolve from "speed" to "effectiveness."

- The challenge that we faced lies in understanding how to effectively integrate technology to enhance the teaching and learning process, rather than using it as a mere add-on or substitute for traditional methods.

- By viewing technology as a pedagogical instrument rather than a mere tool, educators can unlock its full potential to enhance teaching and learning experiences. A thoughtful and strategic approach to technology integration coupled with ongoing professional development and a focus on student-centred learning will lead to more meaningful and effective educational outcomes.

- The Smart Education platform should continuously enhance its application efficiency. This involves leveraging and analyzing student learning data to provide data support for classroom teaching diagnostics, and further researching strategies and models for enhancing education and teaching quality through digital empowerment.

- In the future, significant changes will occur due to artificial intelligence. Humans will begin to adapt to cultures created by non-human entities. Moreover, as culture serves as the "operating system" for humans, this implies that artificial intelligence will have the capacity to alter the way humans think, feel, and behave.

Forum on Educational Digitalization Strategy and Policy Planning

The ongoing acceleration of the new technological revolution and industrial transformation is reshaping the education ecosystem and its vision. Prioritizing strategic planning for artificial intelligence and designing a rational policy framework for smart education are essential pillars for driving pedagogical innovation and accelerating digital transformation.

Smart Education Policy
Framework

Photo of Forum on Educational Digitalization Strategy and Policy Planning

Ms SONG Shanping, China National Institute for Education and Social Development's Executive Director, pointed out that the rapid evolution of the new technological revolution and industrial transformation is reshaping the education ecosystem and vision. She emphasized the importance of considering education's inclusivity, ensuring that digital education resources reach every learner and that each child can equally benefit from the opportunities brought by digital education.

In her address, **Professor Asha S. Kanwar**, President and CEO of the Commonwealth of Learning, highlighted the significance of artificial intelligence strategies in countries like China, India, Singapore, and South Korea. She noted that the framework of intelligent education policies supports and accelerates teaching innovation and digital transformation. She reported that the strategies focus on providing digital or AI literacy at all levels, building the capacity of

SPEAKERS

Ms SONG Shanping
Executive Director, China Institute of Education and Social Development, China

Prof. Asha S. Kanwar
President & CEO, COL

Dr. Martín Benavides
Director, UNESCO IIEP

Prof. ZHANG Zhiyong
Director, National High-end Think Tank of Education Survey Center, Beijing Normal University, China

Prof. SUN Shanxue
Graduate School of Education, Beijing Foreign Studies University, China

Mr Raúl Valdés-Cotera
Team Leader, UNESCO Lifelong Learning Policies and Strategies Programme, UIL

Mrs Aneeta Ghoorah
Secretary General, Mauritius National Commission for UNESCO

Ms Harlena Harris
Program Director, APEC Human Resources Development Working Group

Prof. Kriengsak Chareonwongsak
Chairman, Nation-Building Institute International, Thailand

Mr Andreas Schleicher
Director, Directorate of Education and Skill, OECD

Dr. Ethel Agnes Pascua-Valenzuela
Advisor of ASEAN on the Future of Education ASCC Research and Development Platform

Mr ZHANG Xuezheng
Deputy Director, Education and Sports Bureau, Luoyang Xigong District, China

Mr HOU Yuandong
Director, Wenzhou Educational Technology Center, Zhejiang Province, China

Dr. Kalyarat Sukruang
Chairman of ISW & CEO of GoldenZone Wellness, Thailand

Mr LUO Cheng
Director, Principal's Office at Fengming Senior High School, Zhejiang Province, China

Ms LI Ahui
Principal, Kaiyue Kindergarten of Xiaoshan District, Hangzhou, China

Ms WU Yanjing
Supervisor, China Galaxy Securities TMT Research Group & Chief Analyst for the Computer Industry, China

Dr. Axel Rivas
Director, School of Education, Universidad de San Andrés, Argentina

MODERATORS

Ms LI Wen
Director, Think Tank Management Office, Beijing Normal University, China

Prof. YANG Junfeng
Deputy Director, Educational Informatization Strategy Research Base (Beijing), Ministry of Education, P.R.China

Dr. JIANG Yanshuang
Office Director, Educational Informatization Strategy Research Base (Beijing), Ministry of Education, P.R.China

teachers, equity and inclusion, and promoting innovation.

Dr. Martín Benavides, Director of the UNESCO International Institute for Educational Planning, emphasized the importance of digitalization and technological innovation in education. He expressed the hope that governments worldwide would incorporate technology into their national strategies to drive educational reform and development.

Professor ZHANG Zhiyong, Director of the National High-end Think Tank Education of Education Survey Center, delivered a keynote report titled "The Strategic Path of Building a Powerful Education Country." He highlighted that the digital wave presents both new opportunities and challenges for comprehensive national education reform. To deepen this reform, he suggested accelerating changes in educational performance evaluation, advancing foundational educational system reforms, promoting digital education empowerment, deepening examination and enrollment system reforms, establishing modern educational governance systems, and strengthening education funding security. These steps collectively contribute to the high-quality development of an education powerhouse.

Professor SUN Shanxue at the International Education School of Beijing Foreign Studies University, delivered a keynote report titled "Key Issues of Digital Development of Vocational Education." He highlighted that adapting to the digital era, building a digital ecosystem for vocational schools, and enhancing teachers' digital literacy and capabilities are key challenges in the digital development of vocational education. He underscored the need to integrate technology into macro policies, construct new digital ecosystems for vocational institutions, and define the digital literacy and skills required of vocational school teachers, all of which contribute to the high-quality development of vocational education.

Mr Raúl Valdés-Cotera, Project Coordinator at the UNESCO Institute for Lifelong Learning (UIL), elaborated on the expansion of the opportunity to receive higher education through digital technology. He pointed out that numerous higher education institutions worldwide are integrating technology-enhanced learning into their courses. Such learning should cater to diverse learner groups by offering appropriate teaching methods and designs while considering varying levels of digital skills, thus contributing to the goal of lifelong learning.

Ms Aneeta Ghoorah, Secretary-General of Mauritius National Commission for UNESCO, remarked that in recent years, as Mauritius' national digital infrastructure has gradually improved, significant changes have occurred in sectors such as education and healthcare. Strategic documents like "Digital Mauritius 2030" and "Mauritius Vision 2030" provide insights and directions for Mauritius' education digitization transformation, serving as fundamental guidelines to address challenges and risks in the digital age.

Ms Harlena Harris, Program Director of the APEC Human Resources Development Working Group, believed that the success of education requires policy design, determination, and capacity building, which is highly challenging, and it should involve a shift in educational models through technology empowerment. She shared that the responsibility for shaping the future of education does not lie solely with policymakers or education specialists and it demands collective action and shared ownership.

Professor Kriengsak Chareonwongsak, Chairman of the Nation-Building Institute International (NBII), Thailand, delivered challenges and strategies on educational digitalization in 12 aspects: Equality and Inclusivity; Quantity and Quality; Competency and Acceptance; Privacy, Security and (Public) Accessibility; Health and Wellness; Specificity and Comprehensiveness; Compulsion and Personalisation; Engagement and Motivation; Assessment and Evaluation; Flexibility and Dynamism; Collaboration and Integration; and Accuracy and Economy.

Mr Andreas Schleicher, Director for the Directorate of Education and Skill, OECD, highlighted that the growth mindset of young people is what we should focus on. Growth mindset and academic performance are very closely related. Having that growth mindset was also a very important predictor for students to master difficult task, to have a greater sense of self-efficacy, to be less afraid of failure, to see more ambitious learning goals and also to see greater value in school. Those are the mindsets that are so important in the digital world.

Dr. Ethel Agnes Pascua-Valenzuela, Advisor of ASEAN on the Future of Education ASCC Research and Development Platform, mentioned two points about the future of education. The first one is reimagining the education space and looking for innovative solutions to the most pressing problems impacting learning and teaching, and the second one is addressing disruptive technologies, AI tools, and practices that have the potential to reshape the future of teaching and learning as we know it.

From a practical perspective, the impact of national education strategic planning and macro policies on regional education transformation is becoming evident. Representatives from Luoyang Xigong District and Wenzhou shared their insights. They discussed the positive impact of strategic planning and macro policies driven by China's national educational informatization policy on the digital transformation of education in their regions. **Mr ZHANG Xuezheng**, Deputy Director of the Education and Sports Bureau of Luoyang Xigong District, expressed that smart education has provided wings to the development of balanced and high-quality compulsory education in the region, facilitating the high-quality development of education. **Mr HOU Yuandong**, Director of the Wenzhou Education Technology Center highlighted that Wenzhou City, in the process of building the "Digital Brain," has created an integrated application platform named "Good Learning Wenzhou." This initiative has fostered a cross-departmental, cross-level educational collaborative mechanism and established a smart education ecosystem.

Dr. Kalyarat Sukruang, Chairman of ISW, and CEO of GoldenZone Wellness, Thailand, shared a topic about Thailand Wellness Academy Development. The NBI places great importance on wellness and aims to become a leading organization in driving Thailand to become the Wellness Capital of the World. The main characteristics of the NBI Wellness Programme are Good Content, Outstanding Network, Engaging Activities, Study Visit to Famous Places, and Cap-Corner Stone (CCS) Projects.

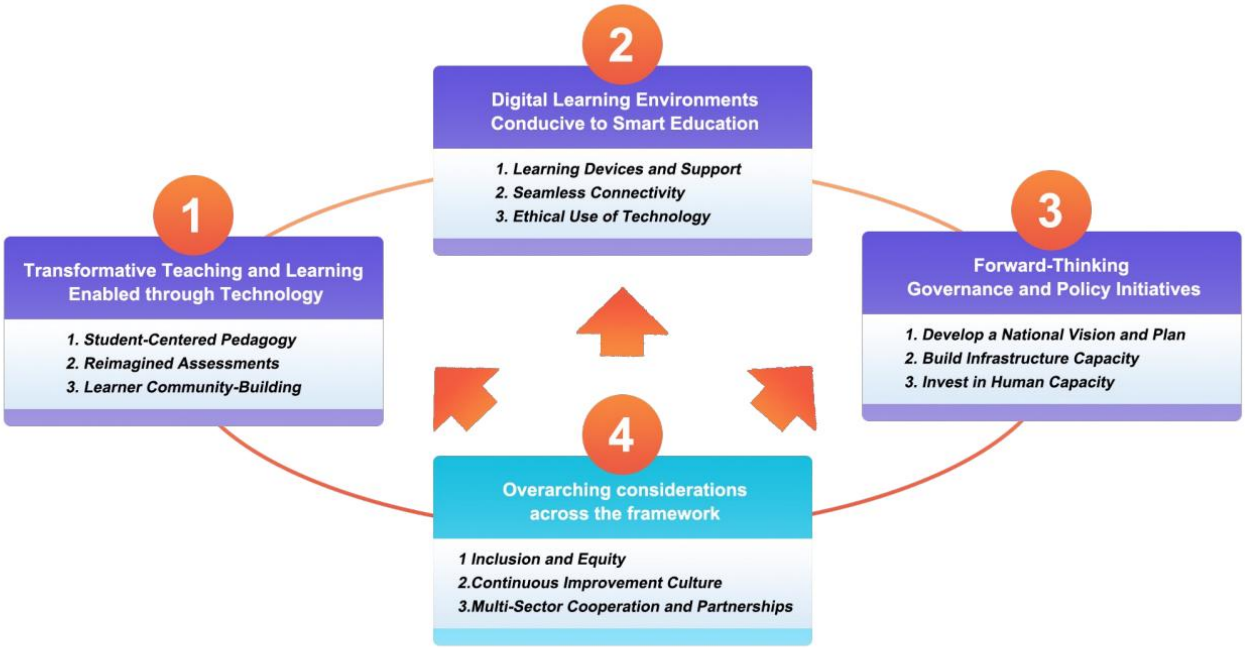
Mr LUO Cheng, Director of the Principal‘s Office at Fengming Senior High School, Tongxiang City, Zhejiang Province, China, delivered a speech named "Ecosystem and Harmony in the Digital Intelligence Classroom". In the context of digital intelligence, the classroom ecosystem requires a human-centred approach, with a primary focus on facilitating students' self-directed development. It emphasizes the interactions among classroom ecosystem factors such as teachers, students, curriculum, resources, and environment. This approach effectively promotes learning engagement, ignites the motivation for both teaching and learning and highlights the vitality of the educational process.

Ms LI Ahui, Principal of Kaiyue Kindergarten of Xiaoshan District, Hangzhou City, China, presented an overview of the quality improvement in kindergarten education under the context of digital intelligence, focusing on needs, pathways, and outcomes. She emphasized that in the era of digital intelligence empowering life and learning, digitalization is not the sole path for education but rather an inevitable route for nurturing future generations. It is about enabling education to stay true to its core principles while innovating its methods, transitioning from tradition to precision, and offering endless possibilities for young children to explore their future lives.

Ms WU Yanjing, Supervisor of China Galaxy Securities TMT Research Group and Chief Analyst for the Computer Industry, China, reported that Artificial intelligence will reshape the educational landscape and trigger a transformation in the education system. With the advent of the GPT large model era, AI-generated personalized learning scenarios by AIGC will be fully developed. Large-scale models will redefine the relationships among participants in the educational ecosystem, address the shortcomings of the industrial-era education system, unlock the true potential of education, and redefine the education industry.

Dr. Axel Rivas, Director of the School of Education, Universidad de San Andrés, Argentina, shared three parallel scenarios of AI in education in the region. The first scenario is an explosion of venture capital. The second scenario is the largest ecosystem is in Brazil, closely associated with university entrance exams. The third scenario refers to the public policies which have generated important equipment initiatives and OLPC models.

*The Forum on Educational Digitalization Strategy and Policy Planning is hosted by China Institute of Education and Social Development, UNESCO IIEP, COL, and Educational Informatization Strategy Research Base (Beijing), Ministry of Education of P.R.China. For more information, the video is available at https://wx.vzan.com/live/page/233705701.


2
Digital Learning Environments Conducive to Smart Education
1. Learning Devices and Support
2. Seamless Connectivity
3. Ethical Use of Technology
1
Transformative Teaching and Learning Enabled through Technology
1. Student-Centered Pedagogy
2. Reimagined Assessments
3. Learner Community-Building
3
Forward-Thinking Governance and Policy Initiatives
1. Develop a National Vision and Plan
2. Build Infrastructure Capacity
3. Invest in Human Capacity
4
Overarching considerations across the framework
1 Inclusion and Equity
2.Continuous Improvement Culture
3.Multi-Sector Cooperation and Partnerships

National Smart Education Framework

Forum on Educational Digitalization Strategy and Policy Planning
Key takeaways

- Many universities and higher education institutions have been strategically utilizing online learning tools to provide learning opportunities for a broader range of learners, especially marginalized and disadvantaged groups. Promoting the exchange of knowledge, experiences, and resources in higher education both within and between countries is crucial for enhancing technology's support for education and expanding diverse enrollment opportunities.

- Technology is racing ahead at a breathtaking speed, the kind of things that are easy to teach have become easy to digitize. We are seeing a decline in the demand for routine cognitive skills, a rise in the demand for technology intensive tasks. And you put the two things together. That is the future of work.

- AI can give students access to a wider range of resources. It can make learning more adaptive, more granular, more interactive to students, and can engage with the special needs of students, with the special needs that we all have by understanding our learning needs.

- AI large-scale models are driving educational transformation, leading to a shift in the focal point of traditional teaching systems. Therefore, traditional educational products should, in addition to their core functions of tutoring and reinforcement, explore strategic approaches to cultivate diverse skills such as students' comprehension and adaptability. This shift encourages students to transition from a problem-solving mindset of "dealing with issues as they come" to one of "making connections and drawing parallels."

- Fostering exchange of knowledge, experiences and resources among HEIs within and across countries would be important to enhance the impact that technology-enhanced learning can have on widening and diversifying access.

- In the context of the AI era, there is significant potential for educational intelligent hardware, AI learning assistants, virtual mentors, and more in the future. The virtual world created by AIGC, with its creativity and human-machine interaction capabilities, will further enhance the alignment of educational resource supply and demand, driving the evolution of education scenarios from single-dimensional to diverse.

Forum on Generative Artificial Intelligence and Futures of Education

The widespread recognition of ChatGPT's capabilities has brought large-scale AI models into the mainstream spotlight for the first time. It possesses the ability to generate high-quality content, including text, images, and videos, through deep learning on vast datasets. The penetration and extensive application of generative artificial intelligence in the field of education will have a significant impact on teaching methods, learning approaches, and assessment methods. It will also complicate the ethical considerations surrounding AI in education. The immense potential and broad application prospects of large AI models have generated widespread interest and attention.

Photo of Forum on Generative Artificial Intelligence and Futures of Education

Centered on Individuals: Empowering Future Education with Artificial Intelligence

Professor John Shawe-Taylor, Director of International Research Center on AI and Professor at the University College London, remarked that Human-centric AI provides a framework for ensuring AI enhances human experience and creativity. Automated educational systems should be driven by human-centric AI. Equally human-centric AI systems should be educational by design so that they afford greater insight and creativity to their users. He also highlighted the potential of AI to enhance online access to quality open educational materials for learners and teachers.

SPEAKERS

Prof. John Shawe-Taylor
Director, UNESCO IRCAI

Prof. Mohamed Jemni
Director, ICT Department, ALECSO

Prof. HUANG Hua
Executive Dean, School of Artificial Intelligence, Beijing Normal University, China

Prof. Neil Selwyn
Monash University, Australia

Prof. LIANG Zheng
Vice Dean, Institute for AI International Governance, TsingHua University, China

Prof. JIAO Jianli
Director, Research Center for Future Education, South China Normal University, China

Ms Annie Ning
Director, Asian Affairs, ISTE

Dr. Ahmed Tlili
Associate Professor, Beijing Normal University, China

Ms FU Minjia
Teacher,Lixian Primary School, Zhejiang Province, China

Mr ZHONG Zixiao
Student, Second Middle School of Kangding City, Sichuan Province, China

Mr ZHOU Runzhou
Student, Sanhe Town Central Primary School, Zhejiang Province, China

Prof. GU Xiaoqing
Director, Shanghai Engineering Research Center of Digital Education Equipment, China

Mr CHEN Hong
Vice President & CTO, Netdragon Websoft Inc., China

Mr ZHANG Zhi
Director, Education Bureau of Baoshan District, Shanghai, China

Mr ZHOU Jiafeng
Vice President, iFLYTEK, China

Mr LI Xiaoyuan
Chief Inspector of Schools, Qingdao Municipal Education Bureau, Shandong Province, China

Ms LIANG Jing
Founding Partner, Squirrel Ai, China

Prof. Arthur Graesser
University of Memphis, USA

Mr ZHANG Jinbao
Associate Professor, Beijing Normal University, China

MODERATORS

Prof. WU Fati
Dean, School of Educational Technology, Faculty of Education, Beijing Normal University, China

Dr. LU Yu
Associate Professor, Advanced Innovation Center for Future Education, Beijing Normal University, China

Professor Mohamed Jemni, Director of the ICT Department of ALECSO, shared insights into the application of artificial intelligence in the education systems of Arab countries and highlighted exemplary cases of the Arab League actively promoting generative AI applications in education. These cases included initiatives like Arab Code Week, the NFT education platform, blockchain authentication systems, among others. He also introduced the smart learning environments developed within the Arab League's educational system based on platforms such as NFT.

Professor HUANG Hua, Executive Dean of the School of Artificial Intelligence at Beijing Normal University, elaborated on the impact of generative artificial intelligence on education. He traced the evolution of artificial intelligence and generative AI and analyzed instances of their significant influence on education, such as generating teaching materials, automated assignment grading, intelligent question answering, and search functionalities. He also highlighted challenges and issues associated with generative AI in personalized learning and complex reasoning.

Professor Neil Selwyn from Monash University in Australia delivered a keynote titled "AI and the Future of Education - Moving from Reckless Hype toward Realistic Hope." He scrutinized the boundaries, principles, and future scenarios of AI applications in education and emphasized the need to address and rationally analyze criticisms and concerns from society about AI in education.

Professor LIANG Zheng, Vice Dean of the Institute for AI Governance at Tsinghua University, analyzed new applications, challenges, and requirements brought about by AI's empowerment of education. He focused on the emerging applications of AI in educational contexts, its impact on education, new challenges arising from AI integration, and the demands AI places on educational transformation. He underscored that the key to future education lies in schools teaching students how to be better individuals, not just how to acquire knowledge.

Professor WU Fati, Dean of the Institute of Educational Technology at the Faculty of Education, Beijing Normal University, highlighted that artificial intelligence is propelling human society towards collaborative human-machine interactions and interdisciplinary integration, shaping an era of intelligent co-creation and sharing. He noted that generative AI and large-scale model technologies are evolving towards higher complexity, efficiency, and integration with other AI technologies. Applications of AI in education are poised to enhance personalized learning experiences, foster adaptive learning environments, stimulate creativity and inspiration, facilitate human-machine collaborative teaching, and develop high-quality educational resources.

Human-Machine Dialogue: Opportunities and Challenges Generative AI Brings to Education

生成式人工智能与教育的未来论坛
Forum on Generative Artificial Intelligence and Futures of Education

This forum featured a segment titled "Human-Machine Dialogue," inviting experts, educators, and students in the field of intelligent education to engage in discussions with four distinct artificial intelligence large models. The participants simultaneously answered questions and took part in discussions. Participants include **Professor JIAO Jianli**, Director of the Research Center of Future Education, School of Information Technology in Education, South China Normal

University, China; **Ms Annie Ning**, Director of Asian Affairs, ISTE; **Dr. Ahmed Tlili**, Associate Professor at Beijing Normal University, China; **Ms FU Minjia**, Information Technology Teacher at Lixian Primary School, Kecheng District, Quzhou City, Zhejiang Province, China; **Mr ZHONG Zixiao**, Student of Grade 2022, the Second Middle School of Kangding City, Sichuan Province, China; **Mr ZHOU Runzhou**, Forth-Grade Student, Sanhe Town Central Primary School, Tiantai County, Taizhou City, Zhejiang Province, China; and Large Model Platforms. Large Model Platforms also "participated" in the dialogue, including ChatGPT4, ERNIE Bot, SparkDesk and Tongyi.

In his opening remarks for the "Human-Machine Dialogue," Professor JIAO Jianli posed ten major questions, addressing challenges in the application of generative artificial intelligence in education. Two students shared their understanding of generative AI based on their daily experiences, engaging in dialogues with experts and AI models from both domestic and international contexts. They raised intriguing questions such as "What role will AI play in the future?" "Will AI replace my teachers?" "Do extraterrestrial beings truly exist?" The student participation is a special feature of this forum.

Industry-Education Integration: Next-Generation AI Facilitating Innovative Educational Exploration

Professor GU Xiaoqing, Director of the Shanghai Engineering Research Center of Digital Education Equipment, delivered a presentation titled "The New Generation of Artificial Intelligence Calling for Innovation of the Industry-Education Integration in the Cultivation of Talents." She emphasized that amidst the constant evolution of technology, artificial intelligence will reshape perspectives on knowledge. Open education needs to be approached with novel concepts and visions, and knowledge production should be integrated into the educational system.

Mr CHEN Hong, Vice President and CTO of Netdragon Websoft Inc., China, introduced the application of generative technologies in producing educational content. He shared the company's practice of combining traditional educational content creation with generative AI technology, presenting explorations and case studies. He pointed out that the key applications of generative models in education are in five areas: content generation for teaching, personalized instruction, intelligent interactions, learning assessment and feedback, and career planning.

Mr ZHANG Zhi, Director of the Education Bureau of Baoshan District, Shanghai, introduced the exploration and practical application of the Baoshan District AI Education Brain. He not only shared application cases from an educational management perspective but also offered in-depth insights from an educational researcher's viewpoint into the use of generative AIED.

Mr ZHOU Jiafeng, Vice President of iFLYTEK, delivered a presentation titled "Artificial Intelligence Empowerment and Digital Intelligence: AI Promoting High-Quality Development of Education." He shared iFLYTEK's achievements and recent applications in critical and systematic technological innovations. He believed that the future of nurturing top-tier innovative talent lies in imagination, creativity, and empathy. The future belongs not to AI but to the new breed of humans who master AI.

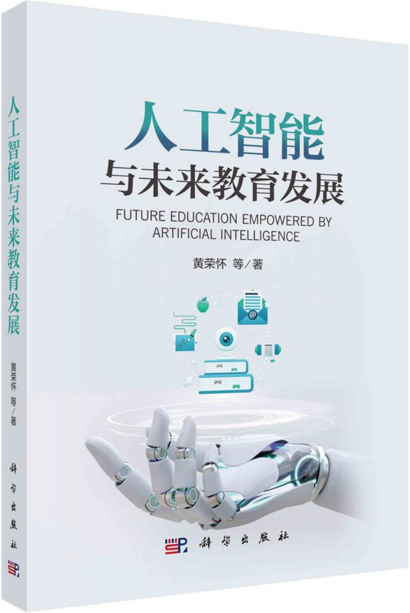
Ms LI Xiaoyuan, Chief Inspector of Schools, Qingdao Municipal Education Bureau, Shandong Province, China, shared the "Qingdao Plan" for AI-empowered education development. Qingdao is determined to transform the decisions and deployments of the 20th National Congress into practical actions for high-quality development, promote the modernization of education with artificial intelligence, and continue to share the wisdom and model for the global development of artificial intelligence education.

Ms LIANG Jing, Founding Partner of Squirrel AI, presented "How AI Teaching Intelligent Hardware Realizes L5 Level Autonomous driving in Education." She discussed Squirrel AI's progress and solutions in building adaptive learning software and hardware. She believed that combining AI-powered learning systems can lead to improved learning efficiency, focused learning efforts, and amplified learning outcomes.

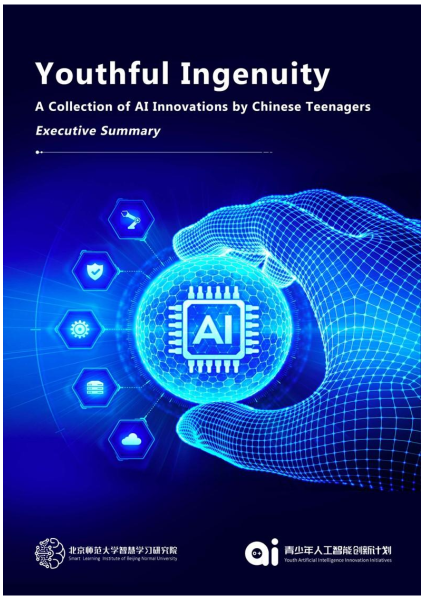
Professor Arthur Graesser from the University of Memphis in the United States introduced the application of conversational agents in learning environments. Computer agents interact with people and understand the learners in real time and at the same time, they are very adaptive in helping them learn. He also shared some examples of an intelligent tutoring system (ITS) with conversational agent.

Outcome Release: Future Education Empowered by Artificial Intelligence

The book titled "Future Education Empowered by Artificial Intelligence", authored by Professor HUANG Ronghuai from Beijing Normal University, has been officially published by China Science Publishing & Media Ltd. At the release ceremony, **Ms FU Yan**, Leader of the Education and Psychology Branch of the China Science Publishing & Media Ltd, delivered a speech on behalf of **Mr YAN Xiangdong**, Vice General Manager of the China Science Publishing & Media Ltd. She emphasized that intelligent education, focusing on the present, oriented toward the future, and supporting the new era of education, is comprehensively explored in this book. The book not only investigates the relationship between artificial intelligence and the future of education, as well as the role of artificial intelligence in educational transformation, but also directly addresses significant challenges yet to be fully understood by academia. She expressed that this achievement possesses both a high level of academic rigor and relevance to national strategies and decision-making. It holds crucial theoretical and practical significance for further advancing educational innovation, reform, and high-quality development, thereby enhancing the overall development level of intelligent education.



Professor HUANG Ronghuai introduced the book's background and main content. "Future Education Empowered by Artificial Intelligence" is a notable outcome of the 2019 Key Project of the National Social Science Fund of China in the field of education, titled "Research on the Development of Artificial Intelligence and Future Education." This project was led by Professor HUANG Ronghuai and involved collaborative efforts from expert teams at Beijing Normal University, Southwest University, Central China Normal University, Zhejiang Normal University, and Beijing Sport University. Within the context of the new round of technological revolution and significant historical transitions in human history, the book examines the role and impact of intelligent technologies in education. It analyzes the critical global issues and challenges facing education in the era of intelligence, focusing on the main contradictions, focal points, and pressing concerns of China's educational reform and development in the new era. From a perspective of future education, the book explores key questions including trustworthy AI, AI and student growth, AI and teacher development, AI and the new generation learning environment. It elucidates the educational characteristics of the intelligent era and identifies the potential, mechanisms, implementation paths, and governance methods for AI-enabled educational transformation. This book is suitable for, but not limited to, educators and students in the field of educational technology, as well as individuals from various sectors concerned with the development of intelligent education.


Youthful Ingenuity
A Collection of AI Innovations by Chinese Teenagers
Executive Summary
AI
北京师范大学智慧学习研究院
青少年人工智能创新计划

During the forum, **Mr ZHANG Jinbao**, Associate Professor from Beijing Normal University, hosted the release of the abstract version of the book "Youthful Ingenuity: A Collection of AI Innovations by Chinese Teenagers" ("Yuanzhuo Project" Youth AI Innovation Plan). In December 2019, BNU launched Yuanzhuo Initiatives in response to the call for implementing the Beijing Consensus on Artificial Intelligence and Education. The goal is to cultivate top-notch innovative youth talents with the ability to apply original and groundbreaking algorithms to address real-world challenges. Major Projects include Online Platform (offering vast AI resources, reaching 70+ countries.), Community (fostering online/offline ICT knowledge exchange), Summer/Winter Camps (enhancing youth cross-border cooperation), and Boosting Case Studies.

*The Forum on Generative Artificial Intelligence and Futures of Education is hosted by FOE of BNU, ALECSO, ISTE, School of Artificial Intelligence of BNU; and partner with NetDragon Websoft Inc. For more information, the video is available at https://wx.vzan.com/live/page/11645672**.**

Forum on Generative Artificial Intelligence and Futures of Education
Key takeaways

- The impact of generative artificial intelligence on education is centred on transforming the future of education, including teaching methods, and shifting from traditional "teacher-student" binary structures in terms of patterns, methods, and content to a transformative "teacher-machine-student" ternary structure, where humans and machines collaborate. The focus of education transitions from knowledge to skills, and the role of teachers evolves from being instructors to guides and mentors.
- AI has a dual impact on the education system. On one hand, it directly influences and empowers education. On the other hand, it indirectly drives educational reform by altering the structure of societal labor demands, thereby necessitating adaptation and leadership in social development.
- The impact of AI on education is not determined by artificial intelligence itself but rather by human decisions and actions.
- Metaverse is a huge social network that includes a mixture of VR technology, augmented reality AR, 3D environments, in addition to AI technologies that are interacted with in real-time, effectively and continuously. It provides a real immersion environment for users, a real feeling, and real virtual communication in environments that are completely similar to real-world environments, in which various types of transactions such as communication, play, shopping, work, and others take place.
- Education is pivotal for achieving the UN SDGs, but demand exceeds supply. To address this, we need innovative solutions that offer global access, are cross-lingual and inclusive, cater to diverse learners, meet labor market needs, and make learning enjoyable.

International Forum on Generative AI Large Models and Psychological Assessment

The explosive popularity of ChatGPT marked the first time that large AI models truly entered the public eye. Generative large models possess immense potential and wide-ranging application prospects. By learning from vast amounts of data and patterns, they can generate high-quality content such as text, images, and videos. This opens up new avenues and methods for psychological assessment research. This forum invited internationally renowned experts and industry professionals in the field of psychological assessment to share their research findings, practical experiences, and innovative ideas related to generative AI models and psychological assessment.

2023
全球智慧教育大会
Global Smart Education Conference
生成式AI大模型与心理评估国际论坛
International Forum on Generative AI Large Models and Psychological Assessment

Group Photo of Guests from International Forum on Generative AI Large Models and Psychological Assessment

Professor John Rust from the University of Cambridge explained the concept, development trends, and risks associated with generative artificial intelligence, while also discussing AI's impact on psychometrics. **Professor Jinyan Fan** from Auburn University's Psychology Department described how personality assessments can be optimized in scenarios like recruitment interviews using AI chatbots. **Professor LUO Fang** from Beijing Normal University shared attempts at automated scoring based on large models. **Dr. Yeun Joon Kim**, Associate Professor at the Cambridge Judge Business School, analyzed the prospects for creativity in artificial intelligence and pointed out that the correct use of ChatGPT would greatly enhance innovation potential in human-machine collaboration. **Dr. LI Xin**, Vice Dean of iFLYTEK AI Research Institute, analyzed the development opportunities, challenges, and future considerations from the perspective of applying large models to psychological assessments. **Dr. SUN Luning**, Research Director of the University of Cambridge Psychometrics Centre, used empirical research methods to compare human creativity with that of ChatGPT and concluded that useful creative answers still primarily come from humans.

*The International Forum on Generative AI Large Models and Psychological Assessment is hosted by Faculty of Psychology of BNU, and partner with Collaborative Innovation Center of Assessment for Basic Education Quality. For more information, the video is available at https://wx.vzan.com/live/page/821706908.

SPEAKERS

Prof. John Rust
Cambridge University, UK

Prof. Jinyan Fan
Auburn University, USA

Prof. LUO Fang
Vice Dean, Faculty of Psychology, Beijing Normal University, China

Dr. Yeun Joon Kim
Associate Professor, University of Cambridge Judge Business School, UK

Mr LI Xin
Vice Dean, iFLYTEK AI Research Institute, China

Dr. SUN Luning
Research Director, University of Cambridge Psychometrics Centre, UK

International Forum on Generative AI Large Models and Psychological Assessment Key takeaways

- Generative Artificial Intelligence (GAI) is an advanced and rapidly evolving form of AI, trained using Large Language Models (LLMs). It can create novel content and behave as if self-aware, making it difficult to distinguish from Artificial General Intelligence (AGI)
- Major Advantages of the AI/ML Approach: (1) Efficiency -Once models are built, various individual differences can be automatically and simultaneously inferred with a single set of digital footprint inputs. (2) Less tedious testing experience: (a) when social media content is used; (b) when automatic video interview or text-based interview (chatbot) is used. (3) Less prone to faking due to less transparent "items."
- AI can complement the key weakness of less creative people. The key issue for less creative people is the lack of skills for idea variations, and the main role of "generative" AI is to generate various ideas.
- It is not technology that changes psychological assessment, but products; however, ultimately, it is individuals who harness technology to heal the human heart.

Forum on New Ecology of Regional Smart Education

Participating experts in this forum engaged in in-depth discussions on the distinctive features of creating smart education demonstration zones and the mechanisms for sustainable development of regional smart education. They collectively deliberated on how to leverage educational digitization to chart new avenues for educational development and shape novel forms of educational progress.

区域智慧教育新生态论坛
Forum on the New Ecology of Regional Smart Education
全球智慧教育大会
Global Smart Education Conference

Group Photo of Guests from Forum on New Ecology of Regional Smart Education

Mr REN Changshan, Division Chief of the Division of Education Informatizationand Network Security, Department of Science, Technology and Informatization, Ministry of Education, P.R.China, released the list of best practices of smart education for 2023, along with the 2022 case compendiums titled *Constructing Regional Smart Education Ecosystems in China* and *Smart Education Best Practices in Chinese Schools*. These two case compendiums have been officially published by Springer.

To further advance the strategic action plan for digital education, promote the development of smart education, facilitate the sharing of experiences, and encourage mutual learning in the field of smart education, under the guidance of the Department of Science, Technology, and Informatization and Informationization of the Ministry of Education, the Secretariat of the Expert Group for the "Smart Education Demonstration Zone" Project collaborated with the Education Informatization Strategy Research Bases of the Ministry of Education (Beijing, Central China, and Northwest China) to conduct the annual collection of outstanding smart education cases in 2023. Ultimately, a total of 324 outstanding smart education cases were selected, including 74 in the regional development category, 226 in the school practices category, 12 in the solutions category, and 12 in the research results category. Informationization of the Ministry of Education, the Secretariat of the Expert Group for the "Smart Education Demonstration Zone" Project collaborated with the Education Informatization Strategy Research Bases of the Ministry of Education (Beijing, Central China, and Northwest China) to conduct the annual collection of outstanding smart education cases in 2023. Ultimately, a total of 324 outstanding smart education cases were selected, including 74 in the regional development category, 226 in the school practices category, 12 in the solutions category, and 12 in the research results category.

SPEAKERS

Mr REN Changshan
Division Chief, Division of Education Informatization and Network Security, Department of Science, Technology and Informatization, Ministry of Education, P.R.China

Prof. ZHU Zhiting
Distinguished Professor, East China Normal University, China

Ms MA Li
Director, Department of Education of the Ningxia Hui Autonomous Region, China

Mr DU Rongzhen
Director, Haidian Education Committee, Beijing Municipality, China

Mr ZHENG Huandong
Director, Wenzhou Municipal Education Bureau, Zhejiang Province, China

Ms HUANG Yan
Director, Nanchang Municipal Education Bureau, Jiangxi Province, China

Mr HE Meilong
Director, Minhang Education Bureau, Shanghai Municipality, China

Mr ZHU Jun
Deputy Director, Wuhan Municipal Education Bureau, Hubei Province, China

Mr QIAO Yue
Program Manager, UNISEDU, China

Ms SHEN Hui
Director, Government and Public Service Systems Department, H3C Business Group, China

Ms DUAN Yuanli
Deputy Director, Bengbu Municipal Education Bureau, Anhui Province, China

Mr LIN Ping
Municipal Level 1 Division Rank Official, Guangzhou Municipal Education Bureau, Guangdong Province, China

Ms JIANG Xiaomei
Director, Wuhou Education Bureau, Chengdu City, Sichuan Province, China

Mr GU Ruihua
Director, Suzhou Center for Education Technology, Jiangsu Province, China

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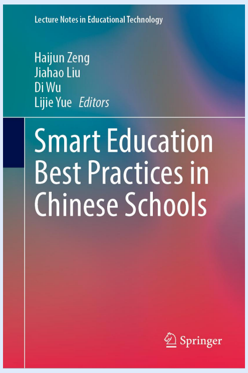
MODERATORS

Prof. YANG Junfeng
Deputy Director, Educational Informatization Strategy Research Base (Beijing), Ministry of Education, P.R.China

Ms WANG Zhuzhu
Member of the Expert Group of "Smart Education Demonstration Zone" Construction Project initiated by the Ministry of Education, P.R.China


Lecture Notes in Educational Technology

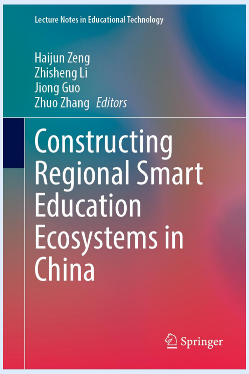
Haijun Zeng
Jiahao Liu
Di Wu
Lijie Yue *Editors*

Smart Education Best Practices in Chinese Schools

Springer

This book presents 28 practical case studies in detail and 49 case studies in brief. The collection of these case studies focuses on one or more aspects of exploration and practice.

The selection and evaluation criteria of the case studies on school practice mainly include concept and implementation, effectiveness and characteristics, innovation and demonstration, and expression and structure. This book helps readers gain a rich understanding of the diverse innovative implementation of smart education in Chinese schools and inspires smart education development in schools in other countries. Available at https://link.springer.com/book/9789819960965


Lecture Notes in Educational Technology

Haijun Zeng
Zhisheng Li
Jiong Guo
Zhuo Zhang *Editors*

Constructing Regional Smart Education Ecosystems in China

Springer

This book enriches the understanding of regional smart education in China and promotes sharing of smart education case studies in China andabroad. It presents 46 case studies selected from a total of 644 case studies collected nationwide in China. These selected case studies focus on regional construction, research findings, and solutions. Available at https://link.springer.com/book/9789819962242

Professor ZHU Zhiting from East China Normal University delivered a keynote presentation titled "The Development of Smart Education Theory and Practice in China." He elucidated the concept and essence of smart education, distilled core theoretical achievements based on a meta-analysis of domestic scholars' research on smart education, and proposed the Chinese practical path for smart education by analyzing the layout of smart education demonstration zones in China and providing case studies of school-based smart education initiatives. The presentation also explored the emerging trends in smart education in the near future.

Ms MA Li, Deputy Director of the Education Department of Ningxia Hui Autonomous Region, shared the region's practical exploration in using digitization to lead the high-quality development of basic education. As a national "Internet+ Education" demonstration zone, Ningxia has seized the opportunities presented by digital transformation, strengthened its digital foundation, built digital infrastructure, and focused on solving various challenges such as the inadequacy of digital hardware in education, a shortage of high-quality educational resources, the limited timeliness and effectiveness of traditional teaching methods, the weak digital integration capabilities of teachers, and the low efficiency of educational services and management.

Mr DU Rongzhen, Director of the Haidian Education Committee, Beijing, shared the process and achievements of creating a new ecosystem for smart education in Haidian under the dimensions of construction, application, integration, and innovation.

Mr ZHENG Huandong, Director of Wenzhou Municipal Education Bureau, Zhejiang Province, China, discussed the progress of smart education in Wenzhou. The city has focused on the core keywords of smart education, "SMART," and has converged innovation across five major areas: strategic top-level design, modern smart campuses, optimized resource allocation, reconstructed application scenarios, and technological support and security.

Ms HUANG Yan, Director of Nanchang Municipal Education Bureau, Jiangxi Province, China, shared the practice of data-driven modernization of education governance in Nanchang. The city has used enrollment data to support school operation and optimize governance mechanisms, driven school and societal resource integration through practical data, and empowered teaching and assessment system innovation with academic data, all aimed at improving the quality of scientific education.

Mr HE Meilong, Director of Minhang Education Bureau, Shanghai, presented a report titled "A New Form of High-Quality Education Development: The Minhang Practice of Creating a Smart Education Demonstration Zone." He discussed the goal setting, regional practices, and future prospects of Minhang District over the past five years, focusing on the deep integration of smart governance, smart teaching, and smart assessment.

Mr ZHU Jun, Deputy Director of Wuhan Municipal Education Bureau, Hubei Province, China, shared Wuhan's efforts in advancing basic education's high-quality development through six aspects: strengthening new infrastructure for smart education, cultivating a new generation of digital literacy, creating a new classroom for smart education, exploring new models for resource supply, innovating new mechanisms for educational evaluation, and establishing a new governance system for education.

Mr QIAO Yue, Program Manager of UNISEDU, introduced the open ecosystem of Tsinghua Tongfang's smart education in the context of digital transformation. He expressed the company's willingness to collaborate and contribute to the creation of a new ecosystem for smart education by sharing core capabilities, cloud capabilities, base capabilities, and central capabilities with various stakeholders.

Ms SHEN Hui, Director of the Government and Public Service Systems Department of H3C Business Group, China, shared the solution of New H3C Group in promoting smart education development using generative artificial intelligence technology (AIGC). She believed that large-scale models in private education would provide more intelligent services for teaching and learning, propelling the intelligent transformation of the education industry.

Director Dialogue:Opportunities and Challenges in Advancing the Development of Smart Education

Speakers in the Director Dialogue part talked about the Opportunities and Challenges in Advancing the Development of Smart Education. They are **Ms DUAN Yuanli**, Deputy Director, Bengbu Municipal Education Bureau, Anhui Province, China; **Mr LIN Ping**, Municipal Level 1 Division Rank Official, Guangzhou Municipal Education Bureau, Guangdong Province, China; **Ms JIANG Xiaomei**, Director, Wuhou Education Bureau, Chengdu City, Sichuan Province, China; and **Mr GU Ruihua**, Director of Suzhou Center for Education Technology, Jiangsu Province, China.

*The Forum on New Ecology of Regional Smart Education is hosted by Secretariat of Expert Group, Ministry of Education’s “Smart Education Demonstration Zone” Construction Project, P.R.China, Educational Informatization Strategy Research Base, Ministry of Education of P.R.China; and partner with UNISEDU and H3C. For more information, the video is available at https://wx.vzan.com/live/page/1591658264.

Forum on New Ecology of Regional Smart Education
Key takeaways

- The construction of smart education demonstration zones focuses on six key tasks to establish exemplary models for smart education. These tasks include Information Literacy - Developing approaches and mechanisms to comprehensively enhance the information literacy of teachers and students, with curriculum and practice at its core; Deep Integration - Exploring new teaching models to facilitate the deep integration of information technology with educational practices; Precision Assessment - Utilizing learning process data to enhance the precision of comprehensive student assessments; Teaching Services -Building a personalized teaching support service environment with interconnected data exchange; Resource Supply -Enhancing the service capabilities of regional education resource supply through collaborative innovation mechanisms; Governance Level -Leveraging new technologies like artificial intelligence and big data to enhance modern educational governance capabilities.

- To innovate mechanisms for enhancing teacher and student literacy, professional development for teachers should include the establishment of provincial-level smart teaching research centres and teacher intelligence training centres. Additionally, the creation of comprehensive service centres that integrate educational theory research, classroom innovation, teacher professional growth, and digital resource development is crucial. This should lead to an integrated smart teaching and research system encompassing provinces, cities, counties, and schools.

- Innovating the path for sustainable educational development involves optimizing the allocation of smart education resources, enriching the supply of educational resources, creating a broad and open learning environment, deepening the integration of technology and teaching, establishing a new paradigm for nurturing digital innovation talents, addressing the dividends of students with special needs in the digital age, and refining models for disseminating high-quality applications.

- In the digital age, the core driving force for creating value lies in the manufacture of digital foundations, digital transmission, data analysis, data application, and the extraction of knowledge from information. Knowledge is continually reorganized from existing resources in human society, ultimately leading to the rapid creation of value.

Forum on Digital Transformation of Regional Education

In today's dynamic educational landscape, the role of technology extends far beyond mere tools; it has become a catalyst for innovation, inclusivity, and excellence in teaching and learning. Regional education, in particular, faces unique challenges and opportunities in harnessing the potential of digitalization. Therefore, this forum provides a platform for educational leaders, policymakers, and innovators to converge, exchange insights, and chart the course for the digital transformation of regional education in China.

2023
全球智慧教育大会
Global Smart Education Conference
区域教育数字化转型论坛
Forum on the Digital Transformation of Regional Education
全球智慧教育大会
Global Smart Education Conference

Group Photo of Guests from Forum on Digital Transformation of Regional Education

Mr CUI Changhong, Deputy Director of Sichuan Provincial Department of Education, China, shared the exploration of Sichuan's digital transformation in education from three key aspects. Firstly, addressing the needs, he emphasized the importance of building a foundation for digital education development centred around smart education platforms. Secondly, focusing on effectiveness, Sichuan has established a three-level digital work system

SPEAKERS

Mr CUI Changhong
Deputy Director, Sichuan Provincial Department of Education, China

Prof. Chee-Kit Looi
Research Chair Professor, The Education University of Hong Kong, China

Mr SUN Chuangui
Director, Changsha Municipal Education Bureau, Hunan Province, China

Mr SUN Yingtao
Director, Zibo Education Bureau, Shandong Province, China

Ms XIONG Qiuju
Director, Changning Education Bureau, Shanghai Municipality, China

Ms DENG Yuhua
Director, Yichang Municipal Education Bureau, Hubei Province, China

Mr LI Tingyi
Director, Education Bureau of Liangjiang New Area, Chongqing Municipality, China

Mr LIU Xiaoqi
Director, Fuzhou Education and Sports Bureau, Jiangxi Province, China

Ms ZHANG Yan
Deputy Director,Erdos Education and Sports Bureau, Inner Mongolia Autonomous Region, China

Mr XU Zhanghai
Deputy Chief Inspector of Schools, Fuzhou Municipal Education Bureau, Fujian Province, China

Mr LIU Chang
Founder, Chairman, CEO, 17 Education & Technology, China

Mr YANG Linfeng
Co-founder, Chairman, Onion Academy, China

Mr NAN Hao
CEO, Luoyang Jingshi Ruidao Intelligent Technology Co., Ltd, China

Mr ZHOU Wenyang
Director, Public Service Bureau of Administration of Chongqing High-tech Industrial Development Zone, China

Mr TAO Zifu
Deputy Director, Hexi Education Bureau, Tianjin Municipality, China

Ms QU Fei
Director, Dadong Education Bureau, Liaoning Province, China

Mr LI Bing
Deputy Director, Wuhu Municipal Education Bureau, Anhui Province, China

Ms ZHANG Ying
Chief Inspector of Schools, People's Government of Chenghua District, Chengdu City, Sichuan Province, China

MODERATORS

Prof. GUO Jiong
Executive Deputy Director, Educational Informatization Strategy Research Base (Northwest), Ministry of Education, P.R.China

Ms HUANG Lulu
Editor, China Education Daily, Special Issue on Informatization and Smart Education, China

within the province. This includes platform construction, the development and application of high-quality resources, and enhanced digital governance in key areas, all contributing to regional digital education practices. Thirdly, centered on transformation, Sichuan has been innovating educational teaching methods and talent development models, emphasizing educational effectiveness, and working to construct the future ecology of digital education.

Professor Chee-Kit Looi, Research Chair Professor of Learning Sciences at The Education University of Hong Kong, China, discussed the preparedness of teachers for digital education transformation and the urgency of AI literacy. He highlighted how online learning platforms can meet the diverse learning needs and interests of individuals, emphasizing that digital education transformation has brought about innovations in teaching and learning methods with technological assistance. AI has changed the way students learn and teachers teach, as well as the evaluation methods. He suggested providing training and support for teachers to help them overcome usage barriers, specifying the skills and knowledge required for teachers to effectively integrate AI, and offering policy and practical guidance to support AI application in education and advance digital education transformation.

Mr SUN Chuangui, Director of Changsha Municipal Education Bureau, Hunan Province, China, shared the exploration and practice of using smart technologies to enhance the quality of education in regular middle schools in the Changsha region. Changsha has incorporated new-generation information technologies such as big data and artificial intelligence into the comprehensive assessment of the quality of education in regular middle schools. This includes refining the evaluation indicator system, developing evaluation analysis models, and strengthening the application of evaluation results. These efforts have addressed a series of challenges in comprehensive assessment implementation, value-added assessment, and the application of evaluation results.

Mr SUN Yingtao, Director of Zibo Education Bureau, Shandong Province, China, shared Zibo's exploration in constructing a new ecosystem for digital education development that encompasses the entire environment and all elements. Zibo aims to promote high-quality and equitable education, focusing on key pathways such as the transformation of teaching environments, education resources, educational processes, educational decision-making, and the education system. The city is working towards creating new teaching and learning models that integrate information technology, to achieve the scale and regularity of information technology integration and innovation in education.

Changning District is the first experimental zone for digital education transformation in Shanghai. **Ms XIONG Qiuju**, Director of the Changning Education Bureau, Shanghai, China, introduced the district's exploration and practical experience. Changning District has formulated a feasible path for promoting "standardization+personalization" in digital education transformation, based on three key concepts: "base," "data," and "ecosystem." She emphasized that implementing digital education transformation across the entire district is the optimal approach and that digital education is a viable path for regional contributions to building a strong nation.

Ms DENG Yuhua, Director of the Yichang Municipal Education Bureau, Hubei Province, China, shared Yichang's practice of strengthening its educational foundation and empowering digital education transformation. Yichang seized the opportunity presented by the smart city construction strategy, establishing an educational foundation, and adhering to the principles of "standard + personalization." The city has enhanced its education governance, promoted educational scenario applications, and explored the "1 platform + 3 domains + N scenarios" system to advance digital education development. This has allowed Yichang to play an active role in the development of education in the digital era.

Mr LI Tingyi, Director of the Education Bureau of Liangjiang New Area, Chongqing, China, presented the district's practices and reflections on smart education, focusing on four keywords: positioning, system, integration, and efficiency. Liangjiang New Area considers smart education as a vital direction for building fair, high-quality, and future-oriented education. Through initiatives like undertaking the National 5G+ Smart Education Application Pilot Project, the district has achieved comprehensive coverage of smart education application scenarios. This effort has effectively enhanced the digital literacy of teachers and students, resulting in several outstanding practical cases.

Mr LIU Xiaoqi, Director of the Fuzhou Education and Sports Bureau, Jiangxi Province, China, shared the achievements of the city's digital education transformation. Fuzhou's experience can be summarized in six aspects: high-level promotion, building digital education application scenarios; increased investment, improving the digital education environment; resource aggregation, advancing the application of digital education platforms; optimized construction, achieving high-quality workload reduction for smart assignments; integrated innovation, promoting the deep application of digital campuses; digital transformation, constructing a new mode of education and teaching.

Ms ZHANG Yan, Deputy Director of the Erdos Education and Sports Bureau, Inner Mongolia Autonomous Region, China, provided an overview of the achievements in the regional education digital transformation, covering areas such as digital infrastructure construction, digital teaching application, digital workforce development, and sharing digital resources. She shared the development experience of the "Four Projects and One Action" in smart education.

Mr XU Zhanghai, Deputy Chief Inspector of Schools, Fuzhou Municipal Education Bureau, Fujian Province, China, delivered his speech on behalf of **Mr YOU Xin**, the Director of the Fuzhou Municipal Education Bureau, Fujian Province, China. Fuzhou has leveraged the "Digital Fuzhou" strategy to lay the foundation for new infrastructure and encourage diverse and characteristic development. The city has expanded digital education application scenarios, including school information governance, promoting high-quality and equitable education development, and profiling the growth and development of teachers and students.

Mr LIU Chang, Founder, Chairman, and CEO of 17 Education & Technology, China, shared the company's deep involvement in serving regional education digital transformation over the past few years.

Mr YANG Linfeng, Co-founder and Chairman of Onion Academy, China, discussed "Collaborative Empowerment of Human and Machine for DigitalTransformation to Support High-Quality Education Development," sharing the company's practices in assisting regional education digital transformation.

Mr NAN Hao, CEO of Luoyang JingShi RuiDao Intelligent Technology Co., Ltd., shared reflections and explorations on using digital transformation to promote high-quality and equitable development of compulsory education in the Xigong District of Luoyang City.

Director Interview: Mechanisms and Pathways for Digital Transformation in Regional Education

The topic of director interview is "Mechanisms and Pathways for Digital Transformation in

Regional Education". Speakers include **Mr ZHOU Wenyang**, Director, Public Service Bureau of Administration of Chongqing High-tech Industrial Development Zone, China; **Mr TAO Zifu**, Deputy Director, Hexi Education Bureau, Tianjin Municipality, China; **Ms QU Fei**, Director, Dadong Education Bureau, Liaoning Province, China; **Mr LI Bing**, Deputy Director, Wuhu Municipal Education Bureau, Anhui Province, China; and **Ms ZHANG Ying**, Chief Inspector of Schools, People's Government of Chenghua District, Chengdu City, Sichuan Province, China.

*The Forum on the Digital Transformation of Regional Education is hosted by Educational Informatization Strategy Research Base, Ministry of Education of P.R.China, CIT; and partner with Luoyang Jingshi Ruidao Intelligent Technology Co., Ltd. For more information, the video is available at https://wx.vzan.com/live/page/2144823294.

Forum on Digital Transformation of Regional Education
Key takeaways

- Educational digital transformation, with the core goal of fostering morality and character development, while also balancing equity and quality, aims to revolutionize the ways of teaching and learning. This aligns with the overarching objective of building a strong education nation and has the potential to drive high-quality development in the regional education landscape.

- Digital technology has emerged as a transformative and all-encompassing force, reshaping the mindset, organizational structure, and operational modes within education.

- To address the challenges in education reform and development through transformation, there is a need to transition the education system from stage-based learning to lifelong learning and shift the educational operational mechanism from management to governance at the level of institutional mechanisms. This involves utilizing digitization to enhance the efficiency of educational management, assure educational services, and establish a digital governance system.

- To provide robust support for smart education, it is imperative to enhance network security by improving relevant work protocols, conducting cybersecurity awareness campaigns and service quality enhancement projects, bolstering capabilities in network security perception, protection, auditing, and tracing, ensuring that all critical information systems undergo graded protection assessments, and strengthening the protection of sensitive data.

- Artificial Intelligence can enhance students' learning experience, analyze students' performance provide personalized feedback for improvement, and enable them to learn at their own pace and focus on areas where they need the most support.

Teacher Forum on Innovative Practice of Smart Education

As we move toward a more interconnected and digitally-driven world, the forum provides a platform for educators to share their experiences, insights, and best practices in incorporating technology into the classroom effectively. It explores the challenges and opportunities presented by smart education and seeks to develop strategies for its widespread implementation.

Ultimately, the outcomes of this forum have the potential to shape the future of education, influence pedagogical approaches, and inform educational policies. It underscores the commitment of educators and institutions to adapt to the digital age, ensuring that students receive a holistic, forward-looking education that equips them with the skills and knowledge needed for success in an ever-changing world.

2023
全球智慧教育大会
智慧教育创新实践论坛
（教师论坛）

Photo of Teacher Forum on Innovative Practice of Smart Education

Professor YUAN Jiazheng, Dean of College of Science and Technology at Beijing Open University, shared insights into the role of Artificial Intelligence in Open Education Transformation and Development (AIOTD). From the perspective of generative artificial intelligence and innovative educational applications, he analyzed the current status and key roles of intelligent open education, and explained the directions and key application characteristics of intelligent open education integration. He also introduced the application of

SPEAKERS

Prof. YUAN Jiazheng
Dean, College of Science and Technology, Beijing Open University, China

Prof. XIONG Yu
Director, AI and Smart Education Centre, Chongqing University of Posts and Telecommunications, China

Prof. NIE Zhuming
Dean, Institute of Smart Education, Anhui Normal University, China

Dr. LV Mingjie
Research Specialist, Zhijiang Laboratory, China

Dr. WANG Qiyun
Associate Professor, Nanyang Technological University, Singapore

Prof. XIANG Hua
Beijing Normal University, China

Mr JIANG Jian
Secretary, Party Committee of South China Experimental School, Longhua District, Shenzhen, China

Prof. XU Hailong
Dean, Wenzhou Institute of Education and Teaching, Zhejiang Province, China

Mr XIONG Jin
Principal, Beijing Dongzhimen High School, China

Ms JIN Yan
Principal, Experimental Primary School Affiliated with Sichuan University, China

Mr SU Yi
Chairman, NetDragon Star Epoch Academy, China

Mr CHEN Feng
Teacher, Taihu Gezhi Middle School, Wuxi City, Jiangsu Province, China

Mr ZHAO Qimin
Teacher, Aerospace City School of RDFZ, China

MODERATOR

Prof. LI Yushun
Beijing Normal University, China

intelligent open education at Beijing Open University, emphasizing their research focus on intelligent education and smart education. They are establishing an "Intelligent Education Research Platform" and working on building an internationally influential "Open Education Resource Center."

Professor XIONG Yu, Director of AI and Smart Education Centre at Chongqing University of Posts and Telecommunications, shared research and practical exploration related to the comprehensive assessment of student intelligence in the new era. In the context of innovative development in educational assessment, he called for the use of modern information technologies such as artificial intelligence and big data to explore "full-sample, full-process, and comprehensive" reforms in student assessment. This involves gathering and managing holistic student data and developing comprehensive intelligent platforms to facilitate innovative decision-making in student assessment. He presented in-depth case studies on the development of educational comprehensive assessment with the support of intelligent technologies.

Professor NIE Zhuming, Dean of Institute of Smart Education at Anhui Normal University, delivered a presentation titled "How to Introduce Computer to Kids at an Early Age: A Comparison between Chinese and American Programming

Learning Kits for children." He conducted a comparative analysis of five types of programming learning kits for young children, covering aspects such as their developmental history, design principles and objectives, physical programming blocks, programming methods, and differences in logic. This research aims to provide more suitable programming education for young children and offer insights and inspiration for the popularization of programming education.

Dr. LV Mingjie, Research Specialist at Zhijiang Laboratory, China, shared insights into the impact of resource allocation in artificial intelligence education technology on the balanced development of basic education. From the perspective of effective allocation of digital educational resources, she conducted a top-down analysis of the challenges in digital resource allocation and proposed a bottom-up social simulation solution. This solution involves the construction of decision-support products. She introduced three typical applications of this approach, including digital resource procurement plans, identification of key points for improving product effectiveness, and writing diagnostic reports for project implementation.

Mr WANG Qiyun, Associate Professor from the National Institute of Education at Nanyang Technological University in Singapore, shared insights into the future development of smart education through an online presentation. drawing on his research and the development of the academic field, he described the directions in which smart education is evolving, focusing on blended learning, artificial intelligence-supported personalized learning, and immersive learning environments. He painted a vision of future learning empowered by technological advancements.

Professor XIANG Hua from the Department of Physics at Beijing Normal University shared insights into conceptual science and technology education. Combining his research and practical expertise, he used a combination of graphics and text to clearly explain the relationship between science, technology, and science education. He summarized the three stages of science education development, which include scientific knowledge instruction, technology education, and science and technology innovation education. He emphasized that science and technology innovation education involves technology or data-intensive exploratory practices in science education. Its goal is to cultivate intelligent social innovators who can learn, work, interact with others, and adapt to their environment effectively.

In the *Case Report* part, the guests shared their practical experiences in integrating technology with subject curricula, exploring the applicationof educational technology in practice, and enhancing teacher professional development in the digital environment. Their insights provided valuable directions and ideas for transforming the educational teaching environment. They are **Mr JIANG Jian**, Secretary of the Party Committee of South China Experimental School, Longhua District, Shenzhen City, China; **Professor XU Hailong**, Dean of Wenzhou Institute of Education and Teaching, Zhejiang Province, China; **Mr XIONG Jin**, Principal of Beijing Dongzhimen High School, China; **Ms JIN Yan**, Principal of Experimental Primary School Affiliated with Sichuan University, China; **Mr SU Yi**, Chairman of Netdragon Star Epoch Academy, China; **Mr. CHEN Feng**, Teacher of Taihu Gezhi Middle School, Wuxi City, Jiangsu Province, China; and **Mr ZHAO Qimin**, Teacher of the Aerospace City School of RDFZ, China.

*The Teacher Forum on Innovative Practice of Smart Education is hosted by CIT and SLIBNU. For more information, the video is available at https://wx.vzan.com/live/page/1622106796.

Teacher Forum on Innovative Practice of Smart Education
Key takeaways

- Leveraging technologies such as virtual reality, augmented reality, and artificial intelligence, the school can develop new digital educational resources, including integrated virtual and physical teaching scenarios, intelligent tutoring systems, AI-powered teaching assistants, intelligent study companions, and educational robots. These resources better serve various teaching activities such as knowledge construction, skills training, communication, collaboration, and feedback evaluation for both teachers and students.

- Big data has become a crucial foundation for precision teaching, demanding that teachers possess the ability to think and solve educational problems using data-driven thinking and methods. Teachers are expected to accurately analyze data and discover correlations among data, thereby raising the bar for their data literacy.

- AIGC can optimize teaching tools, enhance teaching efficiency, and introduce innovative teaching methods. For example, combining AIGC with virtual reality can enable novel teaching approaches, like using it as a virtual partner for physical exercises, synthesizing digital teachers across different subjects, tailoring personalized learning plans, and providing individualized tutoring.

- In the context of collecting diverse and heterogeneous campus data at different granularities, AIGC not only conducts data governance guided by business needs (business knowledge) but also uses data collection and utilization (business data) to drive scientific decision-making and actions in educational business. This approach establishes a continuous data governance mechanism driven by both business and data in a bidirectional manner, supporting the development of smart education through educational big data.

- The school selects products from the product database based on type and cost, and the procurement management terminal provides simulated trends in product usage by the school's teachers and their teaching effectiveness. Schools can choose resource allocation strategies prioritizing technology integration, teaching effectiveness, educational equity, and more, based on the feedback provided by the terminal.

Student Forum on Innovative Design for Future Education

"Student Forum on Innovative Design for Future Education" was held at the Changping Campus of Beijing Normal University on the afternoon of August 20th. Based on the actual situation of their countries and regions and combined with their own experiences, 13 outstanding college student representatives from China, Indonesia, Bangladesh, Myanmar, Vietnam, Rwanda, Sierra Leone, Eritrea, Tanzania and Italy, as well as experts, scholars and elites from education, design and other related fields, shared their opinions and innovative solutions of the future education from four dimensions: "Promoting Inclusive Education", "Developing Digital Competence of Teachers", "Designing Equitable Learning Environments" and "Fostering Digital Transformation of Learning".

Group Photo of Student Forum on Innovative Design for Future Education

Mr SONG Weizu, Founder of Beijing Design Society, China, pointed out that as the new wave of technological revolution and industrial transformation deepens, human society will usher in an era of human-computer collaboration, cross-border integration and co-creation and sharing. Design is the core element of human innovation and development, and the core that really plays a role in design is humanity. Therefore, the issue of human education has naturally become a key issue in the era of technological revolution and innovative development. Mr SONG hopes contemporary college students to explore the formations, paths and needs of future education from the perspective of design thinking, and provide innovative solutions.

Ms Natalia Amelina, Senior National Project Officer in Education at UNESCO IITE, pointed out that how to provide quality education for learners is a new challenge for teachers in the era of artificial intelligence. In 2015, the United Nations General Assembly adopted the "2030

STUDENT SPEAKERS

Promoting Inclusive Education

Mr ZHANG Zihao
Postgraduate student, University of the Arts London, UK

Ms Lily Pan
Ph.D. Student, Beijing Normal University, China

Mr Irene Musengamana
Postgraduate Student, Southwest University, China

Developing Digital Competence of Teachers

Mr David Bull
Ph.D. Student, Beijing Normal University, China

Mr GONG Hongjie
Prospective Postgraduate Student, South China Normal University, China

Dr. Samson Kifletsion Elias Post-doctor, Southwest University, China

Ms Fortunatha Lawrence Mtesigwa Ph.D. Student, Beijing Normal University, China

Designing Equitable Learning Environments

Mr Asrul Sidiq
Ph.D. Student, Australian National University, Australia

Ms LU Jiaqi
Ph.D. Student, Beijing Normal University, China

Ms Le Doan Hai Anh
Undergraduate Student, Hanoi University of Science and Technology, Vietnam

Fostering Digital Transformation of Learning from Students' Perspective

Mr ZHANG Zishuo
Graduate Student, Beijing Normal University, China

Mr Zia Islam
Ph.D. Student, Asian Institute of Technology, Thailand

Ms Camila Cimadamore-Werthein
Ph.D. Student, University of Cambridge, UK

SPEAKERS

Mr SONG Weizu
Founder, Beijing Design Society, China

Ms Natalia Amelina
Senior National Project Officer in Education, UNESCO IITE

Ms NI Jiaqi
Deputy Secretary, Youth League Branch Committee, Beijing Normal University, China

MODERATORS

Dr. Mohamed Oubibi
Post-doctor, Beijing Normal University, China

Ms WANG Huanhuan
Assistant Researcher, Beijing Normal University, China

Mr BAO Haogang
Assistant Researcher, CNAES, China

Dr. Michael Agyemang Adarkwah
Post-doctor, Beijing Normal University, China

Agenda for Sustainable Development", calling on all countries to take action to address the economic, social and environmental sustainability issues facing the world today. One of 17 Sustainable Development Goals (SDGs) emphasizes ensuring inclusive and equitable quality education and lifelong learning opportunities for all. In the practice of rural education, UNESCO recognizes the urgency of promoting educational transformation. It aims to promote the sustainable development of education, unleash the potential of education to cultivate innovate talents, reshape a learner-centered global learning community, and establish a smart education ecosystem.

On behalf of Beijing Normal University, **Ms NI Jiaqi**, Deputy Secretary of the Youth League Branch Committee, pointed out that Report to the 20th National Congress of the Communist Party of China stressed that the central task of the Communist Party of China will be to lead the Chinese people of all ethnic groups in a concerted effort to realize the Second Centenary Goal of building China into a great modern socialist country in all respects and to advance the rejuvenation of the Chinese nation on all fronts through a Chinese path to modernization. Education, science and technology, and human resources are the foundational and strategic pillars for building a modern socialist country in all respects. As the benchmark of normal universities, Beijing Normal University shoulders the mission of bridging the basis of basic education and the leader of higher education. She hopes that by continuing the student forum, college students around the world will share their opinions on "Innovative Design for Future Education", so that all sectors of society will pay attention to the aspirations of college students.

How to Promote Inclusive Education

According to UNESCO, Inclusive education refers to "a process of addressing and responding to the diversity of needs of all learners through professional competence. He proposed to design a smart learning environment for teacher professional development (SLETProD) to provide a cloud-based platform for seamless access to digital technology resources, such as UNESCO E-library and so on. Through promoting co-construction and sharing of digital resources, we can foster subject knowledge upgrade, meet the needs of personalized and collaborative learning and promote the construction of digital learning community.

Mr ZHANG Zihao, a postgraduate from the University of the Arts London, pointed out that there are very few inclusive education schools in China, mainly concentrated in first-tier cities like Beijing, Shanghai, Guangzhou, and Shenzhen. He suggested the design of an online and offline hybrid learning community for children with special needs, where community empowerment can promote the transformation from special education to inclusive education. Community staff and volunteers can organize offline workshops based on a guiding manual, enabling children with special needs to engage in real-world tasks alongside their peers, thus granting them opportunities to interact with ordinary children and broader society. children and parents can also utilize the online community to access learning resources and community events, and engage in discussions.

Ms Lily Pan, a PhD from Beijing Normal University, held that Myanmar’s education system continues to be influenced by substantial disparities in housing and living conditions between rural and urban areas, the socio-political environment and other complex factors. Peace matters for inclusive education in all countries. Due to the lack of communication and harmony between the current government and armed forces, In certain areas under armed control, the government and military struggle to provide basic education facilities and learning resources for national children, and even the safety of children cannot be ensured. Despite the efforts of the United Nations Children's Fund (UNICEF) to offer educational support nationwide to assist children’s learning and to facilitate language development, further actions are needed for making education reachable for the marginalized and vulnerable groups. This expansion aims to maximize the physical and mental well-being of every child and uphold their right to education.

Mr Irene Musengamana, a postgraduate from Southwest University, mentioned that In Rwanda’s context "inclusive education" is often interpreted as "non-exclusionary education". Rwanda has introduced a series of national policies and practices to promote inclusive education since 2017, giving priority to offering equitable access to education for students with special needs. He pointed out that the education in Rwanda suffers from poor teaching quality, rigid method and curriculum, inaccessible environment and other problems. The students with special needs are integrated in mainstream schools but not really included both academically and socially. It is important to combine the power of policymakers, school administrators, teachers, parents and curriculum designers for fostering the attainment of inclusive education.

How to Develop Digital Competence of Teachers

Digital literacy of teachers refers to the awareness, ability and responsibility of using digital technology to acquire, process, use, manage and evaluate digital information and resources, discover, analyze and solve educational and teaching problems, optimize, innovate and transform educational and teaching activities. It has gradually become an important factor influencing the high-quality development of education. The TES emphasized the cultivation of digital competence of teachers.

Mr David Bull, a Ph.D. from Beijing Normal University, shared with us the situation of teacher education in Sierra Leone, in where significant number of unqualified and new teachers accounts for the increasing teacher work force. The existence of digital divide severely hampers the development of teachers’ industry standards outlined in the "Digital literacy of teachers" issued by Ministry of Education of P.R.C. He proposed the application of "U-G-S" innovation model, in which universities, governments, urban schools, suburban schools and rural schools to jointly build urban-rural teaching and research community. Through system construction, resource sharing and technology expansion, the digital literacy of rural teachers can be improved to promote the sustainable development of rural education.

Mr GONG Hongjie, a prospective postgraduate from South China Normal University, held that there is a gap in digital competence between rural teachers and urban teachers in the era of Education 4.0. Due to obsolete teaching equipment, inadequate teacher training system and other factors, the digital literacy of rural teachers needs to be improved to meet the increasing participation in learning, cultures and communities, and reducing exclusion from education and from within education". Inclusive Education is a crucial component of the SDGs for education, and the TES identified quality education for all as one of the five priority areas for action.

Dr. Samson Kifletsion Elias, a post-doctor fellow at Southwest University, pointed that the government of Eritrea has introduced some national policies to explain and promote Information and Communications Technology (ICT) integrated teaching. However, the research indicates that Eritrean teachers hold a narrow and simplistic perception regarding ICT usage and inadequate readiness on ICT practices. Local teachers are not good at using computers to make and share digital learning resources. Meanwhile, senior teachers use computers less frequently than their younger counterparts, which leads to unsatisfactory teaching performance. To improve the digital competence of teachers, he believes we should strengthen teacher vocational training, with infrastructure development and support from governments and other institutions.

Ms Fortunatha Lawrence Mtesigwa, a Ph.D. from Beijing Normal University, emphasized that for any country to thrive and attain digitally literate people, the digital education of teachers is inevitable in both Initial Teacher Education (ITE) and continuous Teacher Professional Development (TPD). Tanzania has improved national formal and informal education through digital technologies, while it still lacks of supportive infrastructure (such as electricity connection, internet), ICT equipment and personnel to utilize ICT. To integrate digital technologies into teaching and learning, she designed a curriculum model of digital competence transformation for pre-service teacher training in Tanzania, which consists of seven stages: substitution, augmentation, modification, redefinition, innovation, final projects, assessment and evaluation.

How to Design Equitable Learning Environments

The design of learning space can create a personalized and inclusive environment for learners and better support the development of various learning activities. In the era of artificial intelligence, learning space are evolving into multiple learning spaces integrating physical and virtual space. The TES emphasized creating safe and inclusive learning spaces to ensure all children have access to education, including marginalized children.

Mr Asrul Sidiq, a Ph.D. from The Australian Nation University, pointed out that Indonesian education system faces significant socio-cultural, economic, and geographical challenges. It is difficult to meet the goals for providing quality education in all regions, particularly in the frontier, outermost and least developed region. National Government conducts periodic and comprehensive evaluations of the education system's performance, which prioritizes fundamental competencies such as literacy, numeracy, and character rather than specific subjects. He proposed fostering digital transformation of school and other education institutions to promote the co-construction and sharing of resources, allocating budgets to meet the needs of internet access and media of schools, and constructing the public digital resources platform for teachers.

Ms LU Jiaqi, a Ph.D. from Beijing Normal University, highlighted that educational research plays a rational guiding role in promoting school reform and development, an innovative driving force to improve school-running benefit and quality and promote the sustainable development of schools. The development of educational research in China is restricted by difference of teachers' cognition and attitude, absence of digital consciousness, unnecessary research resources waste and inadequate process management and so on. She believed that building a resource sharing platform specially for educational research, like European Open Science Cloud (EOSC), with data legislative, regulatory framework and copyright. She also proposed reducing the space-time and security experimental restrictions through digital technology and strengthening the standardization of education research to ensure the fairness and transparency of relevant projects.

Ms Le Doan Hai Anh, an undergraduate from Hanoi University of Science and Technology, emphasized that from the perspective of liberatory thinking, designing equitable environment beyond only working to stop the negative consequences of inequity, but also means promoting the equality of educational values. In Vietnam, the proportion of children who drop out of school in the poor group is significantly higher than in the rich group, and only 46.3% of young people are enrolled in higher education. She proposed to provide personalized learning and training for students in marginalized areas and under-represented groups, and school counseling to dismantle stereotypes and tackle social norms.

How to Foster Digital Transformation of Learning from Students' Perspective

Based on digital transformation, the future education will achieve the digitalization of teaching content and learning methods with the help of information technology and the Internet, and actively explore innovative learning models and promote global learning and cooperation. The TES stressed that the digital revolution must benefit all learners, ensure connectivity and digital learning opportunities for all, build and maintain robust, free and public digital learning contents and platforms.

Mr ZHANG Zishuo, a graduate from Beijing Normal University, held that text, pictures, audio and video, as four common educational media formats, have limitations in representing the models of complex three-dimensional objects. Although 3D models can realistically present the structure and features of objects, it is difficult to be widely used in learning process due to the limitation of extend and intricate production cycles, expensive virtual reality equipment, and inconvenient sharing procedures. He and his team members are committed to designing and developing 3D teaching and learning products that facilitate rapid creation, sharing, real-time interaction, and compatibility across multiple devices. They have achieved some commercial landing results, providing a novel medium of knowledge dissemination.

Mr Zia Islam, a Ph.D. from Asian Institute of Technology, emphasized that the generation of "Born Digital" are generally tech-savvy, prefer visual interactive learning experiences supported by virtual reality or augmented reality (AR or VR) technology, are comfortable with processing intricate information, and tend to be multitaskers. Understanding the unique characteristics of "Born Digital" students is essential for educators to adjust teaching strategies and use appropriate educational tools to provide students with better learning experience. He believes that the application of generative AI technology in education can automatically generate learning resources or quizzes tailored to the needs of individual students, thereby creating personalized learning pathways for students. It can also act as a virtual teaching assistant or a research tool, providing immediate, on-demand support to students.

Ms Camila Cimadamore-Werthein, a Ph.D. from University of Cambridge, mentioned that mental health and well-being is an integral part of UNESCO's promotion of safe and inclusive learning environments. Monitoring and tracking the mental health status of students is a key step towards addressing mental health issues. Based on natural language processing (NLP) technology, she and her team members have built a Computerized Adaptive Test for anxiety assessment model, which can be a useful tool to assist teachers intelligently test the anxiety levels of students and give timely psychological guidance.

*The Student Forum on Innovative Design for Future Education is hosted by UNESCO IITE, Student Union of BNU, Graduate Student Union of BNU, Beijing Design Society, Psychometrics Centre at the University of Cambridge and SLIBNU. For more information, the video is available at https://wx.vzan.com/live/page/926394284.

Forum on Digital Campus and Intelligent Educational Equipment

This forum serves as a vital platform for addressing the pivotal role of technology in modern education and its profound impact on the learning environment. In an era marked by rapid technological advancements, the integration of digital tools and intelligent educational equipment has become a defining factor in shaping the future of education.

Traditional educational methods, while effective in their time, no longer fully meet the diverse needs of today's learners. The digital transformation of education is not merely a trend; it is an imperative response to the evolving educational landscape. The importance of this forum lies in its recognition of the critical need to embrace digital innovation to enhance teaching and learning. By convening educators, technology experts, and policymakers, this forum aims to foster a collective understanding of the significance of digital campuses and intelligent educational equipment. These tools are reshaping the way students access knowledge, collaborate, and engage with their educational journey.

数字校园与智能教育装备论坛
Forum on Digital Campus and Intelligent Educational Equipment

Photo of Forum on Digital Campus and Intelligent Educational Equipment

SPEAKERS

Mr LI Ying
Secretary General, CEEIA, China

Mr YANG Fei
Deputy Director, Center for Educational Technology and Resource Development, Ministry of Education (NCET), P.R.China

Ms Arianna Valentini
Research Analyst, UNESCO IESALC

Prof. YU Shengquan
Executive Director, Advanced Innovation Center for Future Education, Beijing Normal University, China

Mr XU Yongkang
Vice Director, Technical Standardization Department, CEEIA, China

Prof. HU Xiaoyong
Vice Dean, Institute of Artificial Intelligence in Education, South China Normal University, China

Dr. Kritsachai Somsaman
Director, SEAMEO Regional Centre for STEM Education

Mr GUO Dongfeng
Director, Optical Access Solutions for Government and Enterprise, Huawei Optical Product Line, China

Mr ZHOU Zhihua
Founder, CEO, OUR SCHOOL Digital Campus, China

Prof. Petar Jandric
Zagreb University of Applied Sciences, Croatia

Prof. WANG Yunwu
Jiangsu Normal University, China

Ms LIU Dongxue
Director, School Affairs Data Management Center, Beijing Normal University, China

Mr ZHENG Dongya
Director, Technical Department of H3C, China

Ms HAO Yuqin
Principal, Guocheng Primary School, Chengyang District, Qingdao City, Shandong Province, China

Mr ZHU Lixin
Senior Engineer, National Engineering Research Centre of Cyberlearning and Intelligent Technology, China

Mr YAO Ziming
Senior Engineer, National Engineering Research Centre of Cyberlearning and Intelligent Technology, China

MODERATORS

Mr SUN Qiurui
Vice Director, Center of Information & Network Technology, Beijing Normal University, China

Dr. LI Baoping
Associate Professor, National Engineering Research Centre of Cyberlearning and Intelligent Technology, China

Mr LI Ying, Secretary General of CEEIA, China, highlighted the rapid development of next-generation digital technologies such as artificial intelligence and big data. He emphasized the pressing need for educational equipment to keep pace with technological advancements. Mr LI called for deepening theoretical research on educational equipment and engaging in discussions on smart education practices. He stressed the importance of promoting innovation and transformation in product forms, application services, and development mechanisms within the educational equipment sector.

Ms YANG Fei, the Deputy Director of Center for Educational Technology and Resource Development, Ministry of Education, delivered a keynote address titled "Construction and Application of National Smart Education Platform for Primary and Secondary Schools." She provided an overview of the development of the national smart education platform for primary and secondary schools, and discussed the platform's applications from various perspectives, including resources, functions, scenarios, ecosystems, and data. Ms YANG emphasized that the future development of the platform would prioritize connectivity, content, collaboration, needs-driven approaches, and real-world applications.

Ms Arianna Valentini, Research Analyst from the International Institute for Higher Education in Latin America and the Caribbean at UNESCO, delivered a keynote address titled "Harnessing the Era of Artificial Intelligence in Higher Education." She presented the significant role of artificial intelligence in personalized learning, educational research, and educational management. Ms Valentini analyzed the challenges and ethical issues in the future development of artificial intelligence in education. She pointed out that artificial intelligence would extend into our daily lives, serving professionals in various fields, not limited to STEM areas.

Professor YU Shengquan, the Executive Director of Advanced Innovation Center for Future Education of Beijing Normal University, shared his thoughts and practical insights on the construction of a smart campus service ecosystem. He emphasized that smart education is an inevitable trend in future education. He stated that educational services supported by intelligent technologies are the key to the sustained development of smart education. Therefore, the focus of educational informatization should shift from platform and resource development to service construction.

Mr XU Yongkang, the Vice Director of the Technical Standardization Department of CEEIA, elaborated on the development of national standards and industry standards in China's education sector. He also discussed the thought process behind group standards for the educational equipment industry since the reform of national standardization. Mr XU emphasized the vital role of standardization in promoting high-quality and equitable development of compulsory education and the high-quality development of education.

Professor HU Xiaoyong, Vice Dean of the Institute of Artificial Intelligence in Education at South China Normal University, shared insights into collaborative innovation between academia, industry, and research in the field of educational artificial intelligence (AI) with a focus on scenario-driven approaches. He envisioned how AI is empowering the high-quality development of education and generating new dynamics in various aspects of education, including student learning, teacher development, school construction, home-school collaboration, education governance, assessment, and equity.

The forum featured speakers from diverse perspectives, including **Dr. Kritsachai Somsaman**, Director of SEAMEO Regional Centre for STEM Education; **Mr GUO Dongfeng**, Director of

Optical Access Solutions for Government and Enterprise, Huawei Optical Product Line; **Mr ZHOU Zhihua**, the Founder and CEO of OUR SCHOOL Digital Campus; **Professor Petar Jandric** from the Zagreb University of Applied Sciences, Croatia; **Professor WANG Yunwu** from Jiangsu Normal University; **Ms LIU Dongxue**, School Affairs Data Management Center at Beijing Normal University; **Mr ZHENG Dongya**, Director of Technical Department of H3C; and **Ms HAO Yuqin**, Principal of Guocheng Primary School, Chengyang District, Qingdao City. They shared their practical experiences in areas such as digital campus construction standards and applications, smart education equipment and technology solutions, evaluation of smart education products, and collaborative innovation between academia, industry, and research. Their insights provided valuable directions for transforming the educational teaching environment.

Project Release

CIT
OpenHarmony
智慧教育装备领域应用白皮书
互联网教育智能技术及应用国家工程研究中心

Mr ZHU Lixin, Senior Engineer from the National Engineering Research Centre of Cyberlearning and Intelligent Technology, released the "OpenHarmony Smart Education Equipment Application White Paper." OpenHarmony, an operating system with distributed task scheduling and data management capabilities, can be used in various educational terminal devices and IoT devices. It connects people, devices, and scenarios organically, creating a super virtual terminal interconnected world. This system enables rapid connectivity, hardware mutual assistance, resource sharing, and security and trustworthiness, making it a fundamental infrastructure for digital campuses and a necessary support for smart teaching environments.
Available at https://yuanzhuo.bnu.edu.cn/downloads/OpenHarmonyWhitePaper.pdf

Mr YAO Ziming, Senior Engineer from the National Engineering Research Centre of Cyberlearning and Intelligent Technology, called for partners to collaborate on the development of group standards for the education equipment industry, specifically focusing on the "Design Specification for the Digital Campus Network of Primary and Secondary Schools." This initiative aims to plan the network environment construction of digital campuses, providing schools with secure, stable, and efficient network support.

*The Forum on Digital Campus and Intelligent Educational Equipment is hosted by CIT, CEEIA Educational Equipment Research Institute, Center of Information & Network Technology of BNU, and Advanced Innovation Center for Future Education of BNU. China Educational Equipment Industry Association (CEEIA) also provides guidance for hosting this forum. For more information, the video is available at https://wx.vzan.com/live/page/508605679.

Forum on Digital Campus and Intelligent Educational Equipment
Key takeaways

- The key to the construction of smart education services is the establishment of an open service ecosystem. It is based on a service architecture that integrates cloud and network, allowing for the free combination and equal exchange of services in the educational service market. Educational services are collaboratively constructed by the government, educational users, and educational service providers. This multi-stakeholder and collaborative approach can effectively promote the normal operation of the educational service ecosystem.

- Higher Education Institutions need to establish policies and regulations to ensure fair and ethical academic practices, such as releasing guidelines on preventing plagiarism,detecting AI-generated content, and ensuring AI technologies are used appropriately in student assessments.

- The development of new smart learning environments is advancing rapidly. Emerging directions in smart learning environments include blended offline learning environments, short-duration and live broadcast learning environments, multimodal learning environments, virtual simulation learning environments, smart classrooms, smart campuses, and metaverse learning environments.

- Ubiquitous smart learning environments are built on a technological foundation comprising mobile internet, tactile internet, artificial intelligence, blockchain, and other next-generation intelligent technologies. These environments facilitate the transition from knowledge dissemination, sharing, and consumption to knowledge creation. They cater to the personalized, diversified, and intelligent needs of learners, offering immersive learning spaces characterized by high user experience and satisfaction.

Forum on New Teaching and Learning Model Integrating Information Technology

This forum recognizes the pivotal role that information technology plays in reshaping how we teach and learn. The integration of technology into education is not merely an option; it is an imperative. It is a response to the changing needs of students, the dynamic demands of the workforce, and the evolving global landscape. It represents a paradigm shift in how we approach education, focusing on enhancing the learning experience, fostering creativity, and preparing students for a rapidly changing future.

As we gather at this forum, we have the opportunity to explore innovative teaching and learning models that leverage the power of information technology. These models promise to revolutionize education, making it more accessible, personalized, and effective. They hold the potential to bridge gaps in learning, adapt to individual student needs, and equip the next generation with the skills and knowledge necessary to thrive in the digital era.

Photo of Forum on New Teaching and Learning Model Integrating Information Technology

Professor CAI Chun, Vice President of Capital Normal University, emphasized in his address that the digital transformation of education presents significant challenges for both research and practice in education. Capital Normal University's AI Education Research Institute serves as the secretariat of the "New Model of Teaching and Learning Based on Teaching Reform and Integrated Information Technology," a project under the Ministry of Education. It aims to provide comprehensive professional guidance and support to various regions, striving to facilitate the development of curriculum and teaching reform programs for basic education that can be applied nationwide, and to establish an experimental zone brand.

Professor **MO Jingqi**, Deputy Director of the Department of NationalTextbook of the Ministry of Education, introduced the top-level design concept of integrating

SPEAKERS

Prof. CAI Chun
Vice President, Capital Normal University, China

Prof. MO Jingqi
Deputy Director, Department of National Textbook, Ministry of Education, P.R.China

Mr MA Tao
Member of Informatization Teaching Expert Committee, Teaching Committee of Basic Education, Ministry of Education, P.R.China

Mr ZHANG Quan
Division Chief, Division of Teaching and Equipment Informatization, Department of Basic Education, Ministry of Education, P.R.China

Mr LI Zhi
Director, Nanan Education Committee, Chongqing Municipality, China

Ms ZHANG Yongchun
Director, Xigang Education Bureau, Dalian City, China

Mr Guo Jinhua
Director, Huangpu Education Bureau, Shanghai Municipality, China

Ms JIANG Libing
Deputy Director, Yinchuan Education Bureau, Ningxia Hui Autonomous Region, China

Mr WANG Yingjun
Dean, Zibo Institute of Education Informatization, Shandong Province, China

Mr LUO Qinghong
Dean, Chengdu Research Institute of Education Science, Sichuan Province, China

Ms LI Hua
Principal, Shuren Jingrui Primary School, Chongqing Municipality, China

Ms SHAN Youqing
Principal, Xining Yangguang Primary School, Qinghai Province, China

Ms XIAO Chen
Principal, Xingyang School, Suzhou Industrial Park, Jiangsu Province, China

Mr CAO Yang
Vice Principal, Shenzhen Senior High School, Guangdong Province, China

MODERATORS

Prof. CAI Ke
Vice Dean, Institute of Artificial Intelligence in Education, Capital Normal University, China

Prof. CAO Xiaoming
Dean, Faculty of Education, Shenzhen University, China

technology into teaching and assessment. The goal is to transform the subjects, content, methods, and outcomes of assessment through the organic integration of teaching assessment and modern information technology.

Mr MA Tao, Member of Informatization Teaching Expert Committee, Teaching Committee of Basic Education of the Ministry of Education, called for a deep reflection on the value and role of technology in education. He believed that technology has the potential to replace, amplify, and transform teaching practices, leading to the upgrading of educational resources, restructuring of educational structures, and expansion of teaching and learning in terms of time and space. This, in turn, allows technology to reshape new teaching and learning models.

Mr ZHANG Quan, Division Chief of the Division of Teaching and Equipment Informatization, Department of Basic Education of the Ministry of Education, provided an update on the progress of the Ministry of Education's work in the experimental areas for the "New Model of Teaching and Learning Based on Teaching Reform and Integrated Information Technology."

Education directors, research institution leaders, and school principals from regions such as Chongqing, Dalian, Qinghai, and Guangdong engaged in discussions on regional advancement and school exploration in the integration of information technology into teaching and learning. Speakers include **Mr LI Zhi**, Director, Nanan Education Committee, Chongqing Municipality, China; **Ms ZHANG Yongchun**, Director, Xigang Education Bureau, Dalian City, China; **Mr Guo Jinhua**, Director, Huangpu Education Bureau, Shanghai Municipality, China; **Ms JIANG Libing**, Deputy Director, Yinchuan Education Bureau, Ningxia Hui Autonomous Region, China; **Mr WANG Yingjun**, Dean, Zibo Institute of Education Informatization, Shandong Province, China; and **Mr LUO Qinghong**, Dean, Chengdu Research Institute of Education Science, Sichuan Province, China.

In the part of *Principal Roundtable Discussion*, the speakers had a discussion on Schools' Explorations in the Integration of Information Technology and Teaching. They are Ms LI Hua, Principal of Shuren Jingrui Primary School, Chongqing Municipality, China; Ms SHAN Youqing, Principal of Xining Yangguang Primary School, Qinghai Province, China; Ms XIAO Chen, Principal of Xingyang School, Suzhou Industrial Park, Jiangsu Province, China; and Mr CAO Yang, Vice Principal of Shenzhen Senior High School, Guangdong Province, China.

*The Forum on New Teaching and Learning Model Integrating Information Technology is hosted by Capital Normal University. For more information, the video is available at https://wx.vzan.com/live/page/1073229341.

2023
全球智慧教育大会
Global Smart Education Conference 2023
圆桌嘉宾
Panelists
李华
LI Hua
山有青
SHAN Youqing
肖宸
XIAO Chen
曹阳
CAO Yang

Photo of Roundtable Discussion at Forum on New Teaching and Learning Model Integrating Information Technology

Forum on New Teaching and Learning Model Integrating Information Technology Key takeaways

- Innovative assessment tools leverage modern information technologies such as artificial intelligence and big data to explore comprehensive longitudinal assessments of students' learning progress across different grade levels, as well as holistic cross-sectional assessments of their moral, intellectual, physical, aesthetic, and labor-related abilities.

- Through technological empowerment, teaching assessment is undergoing several changes: it transcends the boundaries of time and space, diversifying data collection channels; it employs evidence-based assessment by analyzing learning data; it enhances the capabilities of assessment tools; it assists in monitoring dynamic changes in emotional information, among other aspects.

- Technology enhances the efficiency, effectiveness, and productivity of teaching practices, student learning processes, and content objectives. The fundamental tasks remain unchanged, but technology expands our capabilities in terms of effectiveness and simplification.

- To build a new educational ecosystem for nurturing students in the digital era, it is essential to deeply investigate the rational application of information technology in various subject areas. This involves creating a large-scale, individualized teaching ecosystem driven by data. Emphasis should be placed on stimulating students' proactivity, enthusiasm, and creativity, as well as crafting teaching activities tailored to the developmental needs of each student.

- Information technology and artificial intelligence should be considered as methods, teaching environments, and components of the educational ecosystem. Information technology in education goes beyond hardware and resource allocation; it encompasses a wide range of considerations that extend beyond the technological aspect.

- It is crucial to focus on data collection, analysis, and utilization during the teaching and learning process, integrating these with comprehensive student assessments. This can be achieved through technologies like cloud computing and blockchain, which collect generative behavioral data during the learning process, facilitating teaching analysis and formative assessment, ultimately enhancing the effectiveness of classroom teaching and student development.

Forum on Information Technology-supported Innovative Comprehensive Evaluation of Students

Traditional assessment methods often fall short in capturing the diverse skills, competencies, and potential of today's learners. Moreover, they can be rigid and fail to adapt to the evolving needs of students and the demands of the modern workforce. This forum recognizes that information technology offers a powerful solution to these challenges.

The importance of this forum lies in its commitment to exploring innovative approaches to student evaluation that harness the capabilities of information technology. It provides a platform for educators, policymakers, and experts to come together and share insights, best practices, and cutting-edge ideas in this field.

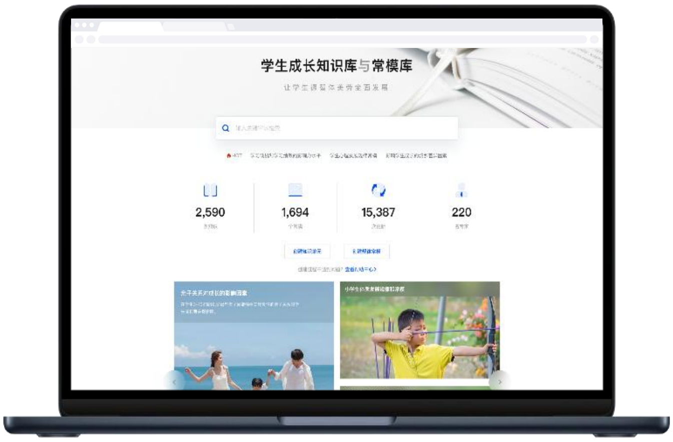
By integrating technology into student assessment, we can create a more comprehensive, personalized, and adaptive evaluation process. Information technology allows us to capture a broader spectrum of a student's abilities, including critical thinking, problem-solving, creativity, and collaboration, which are increasingly vital in today's world.

信息技术支撑
学生综合素质评价创新论坛

Photo of Forum on Information Technology-supported Innovative Comprehensive Evaluation of Students

Ms SHU Hua, Deputy Director of the Department of Science, Technology, and Informatization of the Ministry of Education, emphasized that digitalization in education has become a crucial breakthrough in promoting comprehensive student assessment and offers new avenues to address the challenges of such assessments. Supporting comprehensive student assessment with information technology is both innovative and long-term work, without predefined paths or readily available experiences, and its effectiveness will not happen overnight. The Ministry of Education will work with all stakeholders to build consensus, maintain confidence, prioritize a student-centric approach, pursue stability and progress, promote multi-party collaboration, and encourage integrated innovation. Overcoming challenges and accumulating experience, the ministry aims to pave the way for information technology-supported comprehensive student assessment.

Professor CHEN Li from Beijing Normal University delivered a keynote address titled "Status and Progress of Information Technology-supported Students' Comprehensive Quality Evaluation." The presentation focused on the overall approach of "innovative assessment technology and upgraded assessment solutions." It highlighted the team's innovative explorations in areas such as "innovating the comprehensive



The student growth knowledge base is dynamically constructed

SPEAKERS

Ms SHU Hua
Deputy Director, Department of Science, Technology and Informatization, Ministry of Education, P.R.China

Prof. CHEN Li
Beijing Normal University, China

Prof. XIN Tao
Beijing Normal University, China

Prof. ZHANG Zhaoli
Central China Normal University, China

Dr. XU Wei
Associate Professor, Huazhong University of Science and Technology, China

Dr. CHAI Huanyou
Postdoctor, Beijing Normal University, China

Dr. WANG Huaibo
Postdoctor, Beijing Normal University, China

Mr LIU Yunsheng
Director, Chongqing Educational Evaluation Institute, China

Mr NIE Tingfang
Deputy Director, Changsha Municipal Education Bureau, Hunan Province, China

Ms WU Xue
Director, Yangquan Municipal Education Bureau, Shanxi Province, China

Mr LI Zhaoduan
Vice Director, Teacher Training School of Fangshan District, Beijing Municipality, China

Mr CHENG Yigui
Deputy Director, Nanhai Educational Development and Research Centre, Foshan City, Guangdong Province, China

Prof. ZHENG Qinhua
Beijing Normal University, China

student assessment theoretical model, breakthroughs in data collection and aggregation, intelligent data processing and analysis, development of intelligent performance assessment tools, and the establishment of a platform for comprehensive student assessment and development." Through this, she called upon fellow educators to leverage the advantages of information technology in education assessment and address the current challenges of insufficient comprehensive student assessment capabilities.

Professor XIN Tao from Beijing Normal University presented the results of "Educational Evaluation Reform and the Construction of Comprehensive Literacy Theory." The study introduced an innovative comprehensive literacy theory system, positioning it as the digital foundation for core literacy and comprehensive student assessment. This framework provides crucial support for the implementation of digital-level assessments that contribute to students' holistic development.

Professor ZHANG Zhaoli from Central China Normal University, Associate Professor XU Wei from Huazhong University of Science and Technology, Postdoctoral Fellows CHAI Huanyou and WANG Huaibo from Beijing Normal University, delivered keynote presentations on the theme of technology-enabled assessment.

They shared insights into the path, methods, and practices of using information technology to enhance comprehensive student assessment, focusing on various aspects such as multi-scenario data collection and aggregation techniques for students, intelligent processing technology for comprehensive student qualities, performance-based assessment using intelligent technology, and the support system for comprehensive student assessment.

The forum also centered around the theme "Reform and Innovation of Students’ Comprehensive Quality Evaluation Supported by Information Technology" and featured case reports and exchanges. Education professionals, including **Mr LIU Yunsheng**, Director of the Chongqing Educational Evaluation Institute; **Mr NIE Tingfang**, Deputy Director of the Changsha Municipal Education Bureau; **Ms WU Xue**, Director of the Yangquan Municipal Education Bureau; **Mr LI Zhaoduan**, Vice Director of theTeacher Training School of Fangshan District, Beijing Municipality; and **Mr CHENG Yigui**, Deputy Director of the Nanhai Educational Development and Research Centre, Foshan City, shared their insights and frontline cases regarding education assessment reform and innovation in their respective regions.

The forum concluded with a summary and further outlook by **Professor ZHENG Qinhua** from Beijing Normal University. He highlighted the importance of "integrative innovation, utilizing regional education informationized data, collaborating on regional-specific assessment tools, and collectively exploring solutions for regional comprehensive student assessment supported by information technology" as a significant direction and approach for the future.

*The Forum on Information Technology-Supported Innovative Comprehensive Evaluation of Students is hosted by Research Institute of K-12 Educational Big Data Application of BNU. For more information, the video is available at https://wx.vzan.com/live/page/2120140407.

Forum on Information Technology-supported Innovative Comprehensive Evaluation of Students Key takeaways

- Establishing a formative assessment model and standardizing the evaluation process is of utmost importance. Tailoring the comprehensive quality assessment procedures to the characteristics of students at different stages, namely elementary, middle, and high school, optimizes the focus on each stage. This approach ensures the standardized execution of comprehensive quality assessments, enabling intelligent management throughout the entire process, and facilitating routine implementation.

- Creating an outcome utilization model to fulfil the nurturing function is crucial. Each student's comprehensive quality assessment report and their five-dimensional radar chart clearly depict their growth status. These reports serve as essential references for improving education and teaching methods and for student recognition and awards. The key is to guide students to recognize their growth and progress.

- Leveraging intelligent technology to transform the presentation of tasks, data collection, and analysis processes in assessment practices is vital. This approach examines students' mastery of knowledge and skills when applying prior knowledge to complete a task or solve a problem within a certain real or simulated context. It also assesses their development in various complex abilities, such as problem-solving, communication, collaboration, and critical thinking. This assessment method aids in addressing the limitations of assessment objectivity and intelligence.

- Using information technology to refine the comprehensive quality assessment system for primary and secondary school students, with a focus on developing quality education, enhances the scientific, professional, and objective aspects of educational assessment. This, in turn, promotes students' overall development.

- The role of intelligent technology in driving educational assessment reform and innovation can be summarized in four main areas. Firstly, improving outcome assessment involves optimizing the exam processes supported by intelligent technology. Secondly, enhancing process assessment emphasizes the dynamic and diagnostic aspects of educational assessment. Thirdly, optimizing value-added assessment focuses on students' efforts and progress. Lastly, strengthening comprehensive assessment emphasizes the diversity of assessment subjects and methods.

Forum on Teacher Digital Competences and Innovative Talent Cultivation Model

This forum recognized the critical role of educators and the changing educational landscape. In today's digital age, the role of educators has transcended traditional boundaries, demanding a new set of competencies and approaches. The forum revolved around topics related to the construction of the teaching workforce in the digital age, enhancing teachers' digital literacy, innovative talent selection, and the characteristics and growth patterns of the digital generation of students.

2023
全球智慧教育大会
Global Smart Education Conference
教师数字能力与人才培养模式创新论坛
Forum on Teacher Digital Competences and Innovative Talent Cultivation Model
全球智慧教育大会
Global Smart Education Conference

Group Photo of Guests from Forum on Teacher Digital Competences and Innovative Talent Cultivation Model

Professor ZHAN Tao, Director of the UNESCO IITE, mentioned in his address that teachers play a crucial role in the sustainable development of smart education. Many teachers are experts in teaching and learning but may not be proficient in using digital technology. The emergence of new technologies presents both opportunities and significant challenges for teachers.

Dr. Quentin Wodon, Director of the UNESCO IICBA, compared education research data between South Africa and countries within the Organisation for Economic Co-operation and Development (OECD). He found that there is a substantial demand for teacher training in South Africa and hopes that there will be assistance in the future, particularly in the areas of digital skills and literacy development for teachers.

SPEAKERS

Dr. Quentin Wodon
Director, UNESCO IICBA

Prof. ZHAN Tao
Director, UNESCO IITE

Dr. REN Youqun
Director, Department of Teacher Education, Ministry of Education, P.R.China

Mr CUI Tinghui
Deputy Director, Qinghai Provincial Department of Education, China

Prof. Gyöngyvér Molnár
Head, Institute of Education, University of Szeged, Hungary

Prof. FENG Xiaoying
Faculty of Education, Beijing Normal University, China

Ms Natalia Amelina
Senior National Project Officer, UNESCO IITE

Mr Borut Čampelj
Researcher, Department of Education Development and Quality, Ministry of Education, Slovenia

Mr SHI Chaoyong
Director, Dazu Education Bureau, Chongqing Municipality, China

Mr LI Tie
Director, Jianan Education Bureau, Xuchang City, Henan Province, China

Ms JI Xiangting
Deputy Director, Department of University Cooperation, Baidu, China

Ms FANG Feiyue
Principal, Ruian Tangxia Experimental Primary School, Zhejiang Province, Wenzhou, China

Prof. Danimir Mandic
Dean, Faculty of Teacher Education, University of Belgrade, Serbia

MODERATORS

Prof. SONG Huan
Director, Institute of Teacher Education Research, Faculty of Education, Beijing Normal University, China

Ms LIN Fan
Overseas Strategy Director of Netdragon Websoft Inc., China

Dr. REN Youqun, Director of the Department of Teacher Education, Ministry of Education, analyzed the new developments in teacher workforce construction in China. He introduced significant initiatives that empower teacher development through digital technology. In recent years, China has enhanced teachers' capabilities in information technology application at primary and secondary schools, systematically fostering teachers' competency in the digital era.

Mr CUI Tinghui, Deputy Director of Qinghai Provincial Department of Education, introduced significant measures taken by Qinghai Province to enhance teachers' digital literacy by leveraging digital resources. Qinghai Province has implemented six key actions as part of its digital strategy: Deepening the Digitization of Education and Teaching, Collaborative Development and Sharing of High-Quality Digital Education Resources, Enhancing Digital Literacy, Improving the Governance and Service Capacity of Digital Education, Creating a New Environment for Digital Education Development, and Enhancing Network Security Protection. These actions have injected new momentum into talent development.

Professor Gyöngyvér Molnár, Head of the Institute of Education, University of Szeged, Hungary, analyzed the profound impact of the deep integration of new technologies like artificial intelligence into education on improving educational diagnosis and assessment effectiveness and teachers' digital technology skills. She presented relevant research data and emphasized the crucial role of teachers' digital skills in enhancing students' digital literacy.

Professor FENG Xiaoying from the Faculty of Education at Beijing Normal University addressed the importance of improving teachers' digital literacy by answering three key questions: Why is it important? What are the critical factors? How can it be enhanced? She elaborated on the new demands for rural teacher workforce development and the high-quality development of rural education in the context of implementing digital education strategies and transforming educational and teaching practices. Her report proposed six new practical approaches for cultivating teachers' digital literacy in the digital age, including new understanding, new concepts, new models, new mechanisms, new platforms, and new patterns.

Ms Natalia Amelina, Chief of Unit of Teacher Professional Development and Networking, UNESCO IITE, pointed out that the "2023 Global Education Monitoring Report" indicates that the application of digital technology has brought about various changes in education and learning. It emphasizes the need for continuous improvement of 21st-century teachers' information and communication technology skills and their application, which will significantly impact teachers' professional development.

Mr Borut Čampelj, Researcher of the Department of Education Development and Quality, Ministry of Education, Slovenia, introduced a series of smart teacher training programs and related research implemented in Slovenia. He believed that future smart teachers will engage in more extensive collaborations with educational leaders, subject matter experts, and industry professionals. Teachers will also establish broader connections with each other to improve teaching methods and better achieve the educational goals of schools.

Mr SHI Zhaoyong, Director of Dazu Education Bureau, Chongqing Municipality, China shared the experiences of smart education development in Dazu District. In the context of educational digital transformation, Dazu District has created a new hub for high-quality education resources by launching four types of classrooms: Weekend Master Classes, Comprehensive Master Classes, Network Classes from Prestigious Schools, and Interactive Classes. They have also constructed a smart education service system characterized by ubiquity, convenience, fairness, and inclusivity through actions such as creating a supportive learning environment, reforming educational assessments, and sharing high-quality educational resources.

Mr LI Tie, Director of Jianan Education Bureau, Xuchang City, Henan Province, China, reported that Jian'an District in Xuchang City has made "achieving high-quality and balanced compulsory education" the core goal of promoting smart education. They have implemented several projects, including improving network infrastructure and capacity, demonstrating digital teaching environments, integrating and innovating school-district platforms, enhancing teachers' and students' digital literacy and skills, and constructing a comprehensive student quality assessment system. They aim to build a new norm for teaching and learning, known as "smart teaching and personalized learning."

Ms JI Xiangting, Deputy Director of Baidu's Department of University Cooperation,shared Baidu's experience in collaborative industry and education talent development. Since the end of 2020, Baidu has been implementing a 5-million-talent development plan, collaborating with universities to establish the Baidu Pinecone Elite Program. This program aims to cultivate outstanding talents with AI potential, aligning with industry demands.

Ms FANG Feiyue, Principal of Ruian Tangxia Experimental Primary School, Zhejiang Province, Wenzhou City, China, elaborated on the school's practical exploration in comprehensive assessment reform. The school has built a specialized, intelligent, and visual "Seven Colors Sunshine Comprehensive Assessment System" based on the "RUI Brain" digital education platform. The school focuses on developing seven major abilities: logical thinking, language, talent, sports, social skills, autonomy, and observation. They use seven methods, encompassing etiquette, physical fitness, environmental protection, innovation, literacy, and talent, to conduct ongoing and summative data assessments. This approach promotes holistic child development and individual growth.

Professor Danimir Mandic, Dean of the Faculty of Teacher Education at the University of Belgrade in Serbia, believed that the rapid development of artificial intelligence technology has broad applications and potential in the field of education. However, the use of artificial intelligence in education also raises new ethical issues. The University of Belgrade, together with the Smart Learning Research Institute of Beijing Normal University and Netdragon Websoft Inc., has jointly established an Artificial Intelligence Education Center.

Awarding Ceremony of the 6th Global Competition on Design for Future Education (For Primary and Secondary School Teachers) Case-study Collection

2023
第六届全球未来教育设计大赛
The 6th Global Competition on Design for Future Education
主办单位 Organizers
北京师范大学 Beijing Normal University
Sponsor
全球智慧教育大会
Global Smart Education Conference

During the forum, awards were also presented for outstanding case-study collection in the 6th Global Competition on Design for Future Education (For Primary and Secondary School Teachers). Professor CHEN Guangju, Chairman of the Guidance Committee for the Global Future Education Design Competition, announced the list of winners on behalf of the organizing committee. It was reported that since the launch of the competition on March 1, 2023, it has attracted over 2,000 primary and secondary school teachers who submitted more than 1,500 entries. In the end, 11 first prizes, 24 second prizes, and 43 third prizes were awarded.

Outcome Release: Edmodo Academy (EDA)

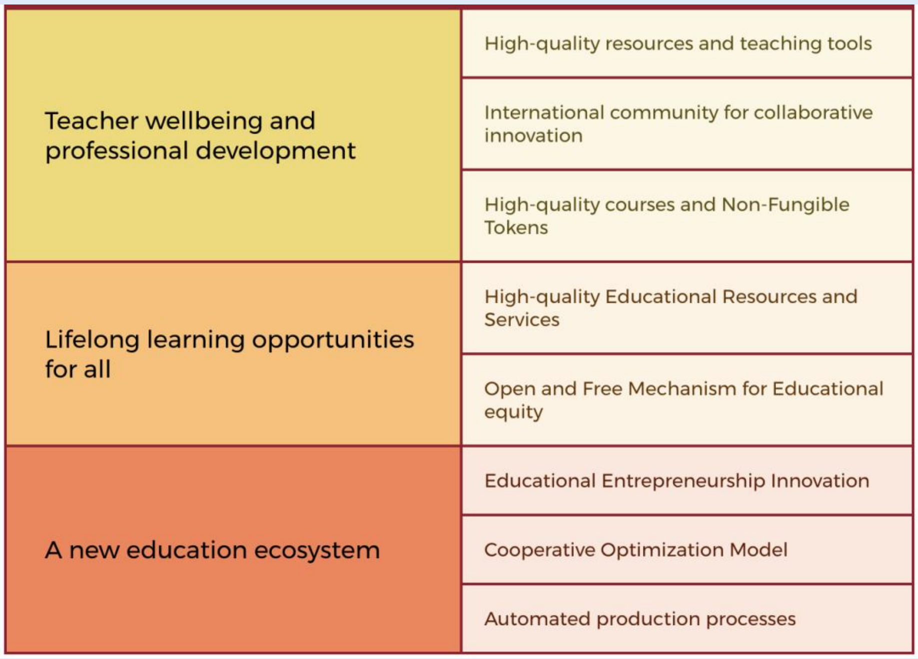
During this forum, **Mr CHEN Changjie**, Vice President of Netdragon Websoft Inc. and Vice Dean of the Smart Learning Research Institute at Beijing Normal University, introduced Edmodo Academy (EDA). EDA, as a public smart education platform for the new era, is Netdragon's first global digital education platform. It is based on the principles of **"free, open, high-quality, co-creation, and sharing."** EDA incorporates advanced technologies such as AI, metaverse, 3D modeling, micro animations, and aggregates a vast amount of digital education resources. It serves global educational users, providing an educational co-creation platform and a diverse incentive system, allowing every user to share the achievements and value of EDA.

EDA's goals are twofold, namely:

- Making free learning ubiquitous and developing high-quality educational resources for everyone. EDA is committed to promoting equality and quality of education for humanity. To accomplish this mission, EDA will actively promote more opportunities for free learning and provide high-quality education, thereby enhancing the effectiveness, efficiency, and experiential nature of teaching and learning.

- Building an innovation education ecosystem featuring global cooperation and sharing, and contributing to building a community with a shared future for humankind. Future learning heavily relies on an educational ecosystem that encompasses educators, learners, content providers, decision-making institutions, and more. In addition to the aforementioned goals, EDA also strives for innovative leadership and the transformation of the future education ecosystem. By introducing concepts such as cryptocurrency and decentralized autonomous organization (DAO), EDA envisions an educational ecosystem where global collaboration creates content and shares ownership, rights of earnings, and governance. This transformative approach may foster the emergence of a genuine community with a shared destiny in online learning.

Key solutions offered by EDA：



Teacher wellbeing and professional development	High-quality resources and teaching tools
	International community for collaborative innovation
	High-quality courses and Non-Fungible Tokens
Lifelong learning opportunities for all	High-quality Educational Resources and Services
	Open and Free Mechanism for Educational equity
A new education ecosystem	Educational Entrepreneurship Innovation
	Cooperative Optimization Model
	Automated production processes

*The Forum on Teacher Digital Competences and Innovative Talent Cultivation Model is hosted by UNESCO IITE, UNESCO IICBA, Key Research Institute of Humanities and Social Sciences for Universities, Ministry of Education of P.R.China, SLIBNU, and NetDragon Websoft Inc. For more information, the video is available at https://wx.vzan.com/live/page/36302219.

Forum on Teacher Digital Competences and Innovative Talent Cultivation Model Key takeaways

- Strengthen research in teaching under the digital education environment, and provide targeted assistance to help teachers enhance their digital teaching capabilities. Utilize technologies such as artificial intelligence and big data to achieve business collaboration, process optimization, structural reshaping, and precise management. This will ultimately improve educational management efficiency and the level of scientific decision-making in education.

- Organize pilot programs for remote teaching in schools in ethnic minority areas, continually enrich and improve the online course resource system, and provide more high-quality educational resources, particularly for teachers and students in rural and pastoral areas.

- Foster a clean online space conducive to the development of both teachers and students. Enhance internet security awareness campaigns targeted at teachers and students, guide young people in developing a proper understanding and usage of the internet, encourage them to consciously resist harmful online content, and elevate awareness of online safety among teachers and students.

- Sophisticated feedback loops can boost the effectiveness of learning and teaching. For example, using low-stakes diagnostic assessment over high-stakes summative testing is more learning-centred and supportive.

- We should think about the complex acquisition knowledge, students knowledge and pupils knowledge where the professors, the teachers should think about the effective, about cognitive and psychometric advances and competencies that students got in the process of learning.

- Teachers need to adapt their pedagogy, use multiple resources related to the curriculum and assessment, and interact more frequently with students and parents.

- Teachers are model learners and knowledge producers who are constantly engaged in educational experimentation and innovation. Teachers collaborate with colleagues and outside experts to produce new knowledge about learning and their teaching practice. A variety of networked devices, digital resources, and electronic environments are used to create and support this community in its production of knowledge and collaborative learning.

Forum on Youth Skills Development and Digital Transformation

It has become imperative to recognize the vital role of skills development, particularly among the youth, in adapting to the digital revolution. Young people represent the future workforce, and their preparedness to navigate and thrive in this digital environment is pivotal to the prosperity of nations and the global economy. This forum brings together experts, policymakers, educators, and stakeholders to deliberate on strategies for equipping the youth with the digital skills and competencies necessary to meet the demands of the modern workforce.

2023
全球智慧教育大会
Global Smart Education Conference
青年技能培训与职业教育数字化转型论坛
Forum on Youth Skills Development and Digital Transformation

Group Photo of Guests from Forum on Youth Skills Development and Digital Transformation

Mr Shahbaz Khan, Director of UNESCO Office in Beijing, delivered a speech outlining the vision, goals, and work plans of the UNESCO Office in China regarding teacher information technology capabilities and educational digital transformation. He emphasized the importance of nurturing digital literacy among teachers and fostering essential skills and competencies in students to adapt to the digital society. Mr Khan stressed that enhancing digital competence is crucial for teacher professional training.

Professor WANG Libing, Director a.i., Chief of Section for Educational Innovation and Skills Development (EISD), UNESCO Multisectoral Regional Office in Bangkok, Thailand, emphasized the need for increased public and private investment in vocational and technical education and training. He also highlighted the importance of elevating the social status of vocational and technical education and training

SPEAKERS

Mr Shahbaz Khan
Director, UNESCO Office in Beijing

Prof. WANG Libing
Director a.i., Chief of Section for Educational Innovation and Skills Development (EISD), UNESCO Multisectoral Regional Office in Bangkok, Thailand

Mr Mark Boris Andrijanič
Former Minister of Digital Transformation, Slovenia

Prof. ZENG Tianshan
Deputy Director, Center for Vocational Education Development, Ministry of Education, P.R.China

Dr. Songheang Ai
Director, SEAMEO Regional Centre for Technical Education Development

Ms YI Fan
Department of Vocational and Adult Education, Ministry of Education, P.R.China

Prof. ZHAO Zhiqun
Institute of Vocational and Adult Education, Faculty of Education, Beijing Normal University, China

Prof. HE Hui
President, Zhejiang College of Construction, China

Dr. Pietro Borsano
Deputy Executive Director, Chulalongkorn School of Integrated Innovation (ScII), Thailand

Prof. LIN Lecheng
Deputy Director, School Academic Committee, Chengdu Vocational University of the Arts, China

Dr. Alexandre Barbosa
Head, Regional Center for Studies on the Development of the Information Society (CETIC.br), Brazil

Dr. Dorothy Okello
Dean, School of Engineering, Makerere University, Uganda

Prof. YANG Wenming
Shenzhen Polytechnic, China

Prof. Ramlee Bin Mustapha
Sultan Idris Education University, Malaysia

MODERATORS

Dr. BAI Bin
Vice Director, Institute of Vocational and Adult Education, Faculty of Education, Beijing Normal University, China

Dr. Boulus Shehata
Faculty of Education, Beijing Normal University, China

Ms KONG Qingling
Project Officer, Section of Higher Education, UNESCO

planning. Professor WANG underscored the necessity of promoting the holistic development of students in TVET, empowering stakeholders on the demand side, fostering connections with industries, nurturing an entrepreneurial culture in TVET students, and driving future job creation.

Mr Mark Boris Andrijanič, Former Minister of Digital Transformation of Slovenia, presented five guiding principles for leading digital transformation in his keynote speech titled "From Digital Natives to Digital Leaders: Empowering Youth with Skills of Tomorrow." These principles include ensuring that no one is left behind, breaking free from traditional thinking patterns, early engagement, increasing engagement through enjoyment, and establishing collaborative relationships. He expressed the hope that more countries would join the process of educational digital transformation at an earlier stage.

Professor ZENG Tianshan, Deputy Director of Center for Vocational Education Development, Ministry of Education, P.R.China, discussed vocational education reform in the context of digital education from three perspectives: the construction of vocational education simulations and deep learning scenarios, the enhancement of modern teacher competencies, and the creation of new forms of teaching materials. He emphasized that vocational education is in great need of digital technology support and that achieving educational modernization and the goal of building a strong nation in education requires a robust teacher support system. This, in turn, will accelerate the realization of a more equitable and higher-quality education.

Dr. Songheang Ai, Director of SEAMEO Regional Centre for Technical Education Development (SEAMEO TED), delivered a keynote speech titled "Digital Transformation and Skills Development." He highlighted the increasing demand for AI and related information technology professionals in future job positions. SEAMEO TED has established projects and funds related to basic education, skill development, and enterprise promotion, which not only promote digital transformation but also help job seekers find better employment opportunities and provide stronger support to businesses.

Ms YI Fan from Department of Vocational and Adult Education, Ministry of Education, P.R.China stated that the strategic action of digitalizing vocational education is an inevitable choice for social development. The profound changes brought about by this strategic action are reflected in three dimensions: traditional school models, traditional assessment models, and traditional governance models. She pointed out that the implementation of the work outlined in "One Core, Two Wings, and Five Key Areas," as well as the promotion of the tasks in "One Forum, Two Platforms, and Four Projects," will be a focus in 2023.

Professor ZHAO Zhiqun from the Institute of Vocational and Adult Education, Faculty of Education, Beijing Normal University, emphasized the importance of learning the new paradigm of vocational learning in an informationized context and discussed the challenges posed by instructional design and educational technology in the process of vocational education informationization. He also introduced a new concept for vocational education informationized learning systems.

Professor HE Hui, President of Zhejiang College of Construction, focused on how to elevate eight key aspects: professional development, classroom efficiency, teacher capabilities, student competence, smart training, digital quality, digital assurance, and societal service by emphasizing smart teaching. He also emphasized the importance of implementing five mechanisms, including management, assurance, supervision, assessment, and updates, to improve the support system.

Dr. Pietro Borsano, Deputy Executive Director of the Chulalongkorn School of Integrated Innovation (ScII), Thailand, delivered a presentation titled "Future Proofing Your Talent." He conducted a profound analysis of the current employment situation's fluctuations and the future trends in employment. He pointed out the significance of cultivating entrepreneurial thinking in individuals to adapt to future developments in the job market and enhance personal competitiveness.

Professor LIN Lecheng, Deputy Director of the School Academic Committee, Chengdu Vocational University of the Arts, introduced three themes related to practical art and shared three classic cases: "Bamboo Light" in Lingshan Jiang Min Hotel, "Fragrance of Rice" in Qiandongnan Miao Village, and "Willow Corridor" in Arxan Countryside. These provided guiding insights for talent cultivation in vocational education digital transformation and rural revitalization.

Dr. Alexandre Barbosa, Head of the Regional Center for Studies on the Development of the Information Society (CETIC.br), Brazil, shared strategic insights on vocational education digital transformation and development, discussing the centre’s overview, digital skills, meaningful connectivity, the importance of measuring new technology application, and its impact on skill development. He also touched on the challenges and opportunities of using technology and digital skills in the educational environment.

Roundtable Discussion

The Topic of the Roundtable Discussion is *Unlocking Digital Opportunities to Rise Together—Empowering Youth with Inclusive Digital Skills*. Speakers include **Mr Mark Boris Andrijanič**, Former Minister of Digital Transformation of Slovenia; **Dr. Dorothy Okello**, Dean of the School of Engineering, Makerere University, Uganda; **Professor YANG Wenming**, Shenzhen Polytechnic, China; and **Professor Ramlee Bin Mustapha**, Professor in TVET, Department of Engineering Technology, Faculty of Technical and Vocational Education, Sultan Idris Education University, Malaysia. They explored challenges and considerations faced by youth vocational education and training in the context of digital education transformation. They discussed practical approaches from various regions worldwide and provided new guidelines and pathways for promoting vocational education digitization and nurturing high-quality technical and skilled talents to adapt to the challenges of the digital era.

*The Forum on Youth Skills Development and Digital Transformation is hosted by SLIBNU, Educational Equipment Committee of CEAIE, and SEAMEO Regional Centre for Technical Education Development. For more information, the video is available at https://wx.vzan.com/live/page/2016029148.

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中国教育国际交流协会教育装备国
AMEO TED)

Roundtable Discussion of Forum on Youth Skills Development and Digital Transformation

Forum on Youth Skills Development and Digital Transformation
Key takeaways

- Entering the digital era, vocational education should be based on the development needs of the new economy, new technologies, new formats, and new professions, adapt to the development trend of digitalization, intelligence, and high-end industries, utilize new technologies such as 5G, big data, and cloud computing, strengthen the integration and intersection of technical skills, promote vocational colleges to adapt to modern reforms, and greatly expand the application boundaries of vocational education in the new era.

- Advocacy can play a crucial role in raising awareness among parents and students regarding the significance of TVET. Developing new narratives based on students' diverse aptitudes is essential. It’s helpful to acknowledge that while some people excel in abstract academic work, others may thrive in operational skills, and many fall between these two orientations.

- TVET systems should forge robust connections with industries at both the national and local levels. The evolution of TVET systems ought not to rest solely within the purview of government but should be shaped and nurtured by the industries they cater to.

- The New Paradigm of Vocational Learning in the Information Age: Learners not only systematically acquire knowledge but, more importantly, complete authentic specialized tasks with the support of information systems. Through learning tasks that are cross-professional and take place in multiple learning environments, enabled by modern information technology, learners are ensured to become the central figures in the teaching process.

- The reform of vocational education can be promoted from three aspects: teachers, teaching materials and teaching methods. For teachers, we must improve platform construction and resource supply, establish and improve the teaching management evaluation and research system, and build a new infrastructure for digital education. For teaching materials, digital technology has created many new forms of teaching materials for education, which not only provide a richer learning experience but also better meet students' personalized learning needs. For teaching methods, practical teaching of digital technology innovation in vocational colleges can focus on students 'practice, practical training and practice. This teaching mode helps to cultivate students' practical operation ability and innovative thinking.

Forum on Smart Village and Rural Education Transformation

In the process of achieving educational transformation and modernization, addressing the deficiencies in rural education is a significant global challenge faced by countries worldwide. Strengthening the digital integration and innovative development of rural education is crucial for bridging the urban-rural digital education divide, enhancing the status of rural education, promoting educational equity, and achieving the United Nations' 2030 Sustainable Development Goal for Education (SDG4).

During the forum, experts and scholars from regions across Asia, Africa, Europe, the Americas, and beyond gathered to discuss topics related to rural education revitalization, rural education's role in overall educational development, opportunities and challenges in rural education's digital transformation, rural teacher workforce development, rural youth's digital skills, and innovation and entrepreneurship. Together, they explored practical pathways to empower smart rural development through technology and promote the digital transformation of rural education.

Mr YANG Yinfu, Vice President and Secretary General of the Chinese Society of Education, China, attended the forum and delivered a speech. He emphasized that education is a noble cause for humanity and a key to rural revitalization. The development of information technology presents both opportunities and challenges for rural education. All stakeholders should strengthen cooperation under the guidance of smart education strategies, harness technology to construct a smart education platform system, facilitate the effective utilization of digital educational resources, and actively promote the deep integration of artificial intelligence and education.

Dr. Quentin Wodon, Director of UNESCO IICBA, , highlighted the close relationship between education and national sustainable development in his address. He introduced the institute's priority areas in digital technology and called upon countries to address the significant challenges in the education sector through empirical research, policy dialogues, and the development of digital skill policy frameworks.

The forum also featured six scholars who delivered keynote speeches on topics related to empowering rural development with smart technology and the development of smart rural education.

SPEAKERS

Mr YANG Yinfu
Vice President & Secretary General, Chinese Society of Education, China

Dr. Quentin Wodon
Director, UNESCO IICBA

Dr. Monserrat Creamer
Former Minister of Education, Ecuador

Prof. Muhammad Yunus
Chairman, AIT Yunus Center, Thailand

Prof. Worsak Kanok-Nukulchai
Fellow of the Academy of Science, Royal Society of Thailand, Thailand

Prof. Moeketsi Letseka
UNESCO Chairholder of Open Distance Learning

Prof. GUO Shaoqing
Director, Educational Informatization Strategy Research Base (Northwest), Ministry of Education, P.R.China

Dr. Socheata Chhorvy Soeur
Under Secretary of State, Ministry of Education, Youth and Sport, Cambodia

Dr. Roger Y. Chao Jr.
Head, Education, Youth and Sports Division, ASEAN Secretariat

Dr. Cosmas Luckyson Zavazava
Director, Telecommunication Development Bureau, ITU

Dr. Habibah Abdul Rahim
Director, SEAMEO Secretariat

Prof. ZENG Xiaodong
Executive Director, UNESCO INRULED

Prof. Vinayagum Chinapah
Stockholm University, Sweden

Dr. Faiz H. Shah
Executive Director, Yunus Center, AIT, Thailand

Mr LIU Yunsheng
Dean, Chongqing Education Evaluation Institute, China

Mr ZHOU Wenke
Director, Bureau of Education, Science and Technology, Ziyun Autonomous County, Guizhou Province, China

H.E. Mr Abdul Tawab Balakarzai
Deputy Minister for Academic Affairs, Ministry of Higher Education, Afghanistan

Ms CUI Lifei
Principal, Lide Experimental Primary School, China

Dr. Indra Muis
Rector, Bina Insani University, Indonesia

Dr. Abid Hussain
Senior Economist, ICIMOD, Nepal

Dr. Ahmed Mohamed
Assistant Professor, Maldives National University

Dr. Helio Brites da Silva
Lecturer, Dili Institute of Technology, Timor Leste

Dr. LU Yao
Deputy Dean, International College of Yunnan Agricultural University

MODERATORS

Prof. ZENG Xiaodong
Executive Director, UNESCO INRULED

Prof. GUO Jiong
Executive Deputy Director, Educational Informatization Strategy Research Base (Northwest), Ministry of Education, P.R.China

Dr. LI Baoping
Deputy Dean, Research Institute of Rural Education and Rural Development, Beijing Normal University, China

Dr. Monserrat Creamer, Former Minister of Education in Ecuador, outlined the ideal vision of education in smart villages, emphasizing personalized learning, individual development, and data-driven education. She believed, that in constructing a smart rural environment, effective data governance plays a pivotal role by aiding us in the collection, organization, and analysis of student and school data. This, in turn, facilitates the formulation of evidence-based policies. Through data analysis, we can monitor students' progress and identify those who may be facing challenges. This capability allows schools to efficiently allocate resources. She proposed building a new rural education paradigm through blended learning, teacher training, community and family involvement, and multi-grade cooperative learning to ensure the sustainable development of rural education.

Professor Muhammad Yunus, Founder of the "Grameen Bank" in Bangladesh, Nobel Laureate, and Chairman of AIT Yunus Centre, emphasized the issue of human agency in the age of intelligence. He pointed out that education should serve human development, and support individuals in realizing their values and missions, and that technology should serve the purpose of education to build a more sustainable world. He also highlighted that students should not only acquire specific skills but also learn how to learn. The purpose of education is to facilitate personal growth, inspire people to pursue goals and integrate such a spirit into the daily lives of learners.

Professor Worsak Kanok-Nukulchai, Executive Director of the School of Integrated Innovation at Chulalongkorn University, and Fellow of the Academy of Science, Royal Society of Thailand, highlighted that artificial intelligence is the "new electricity" of the intelligence era. The democratization and widespread application of artificial intelligence can promote equality and fairness in ten aspects, including improving accessibility and quality of education, enhancing healthcare, boosting agriculture, growing local businesses, and establishing communication networks. This can help bridge urban-rural disparities and support the process of de-urbanization.

Professor Moeketsi Letseka, UNESCO Chairholder of Open Distance Learning, presented how South Africa has transformed traditional university learning through open distance learning and intelligent environments. This approach has expanded the scale of educational resource dissemination, enabling more people to access higher-quality and lower-cost education, thereby promoting educational equity and sustainable development.

Professor GUO Shaoqing, Director of Educational Informatization Strategy Research Base (Northwest), Ministry of Education, P.R.China, focused on "Process Equity in Basic Education in Remote Rural Areas." He highlighted the use of education platforms at various levels to provide rich digital educational resources to rural schools. This support facilitates collaborative teaching between humans and machines, promoting process equity in curriculum delivery through "dedicated classrooms, synchronous classrooms, and expert-led classrooms."

Dr. Socheata Chhorvy Soeur, Under Secretary of State of the Ministry of Education, Youth and Sport (MoEYS), Cambodia, shared the progress and challenges faced by the Cambodian government in promoting education reform and rural development through technology applications, aligning with the country's economic and social development.

Representatives from international organizations shared new concepts, practices, developments, and consensus in the digital transformation of rural areas and rural education in the era of intelligence.

Professor ZENG Xiaodong, Executive Director of the UNESCO INRULED, reflected on the concept of "rurality" and explored the role of technology integration in rural education. She examined the forms and models of rural education development supported by technology, based on the axes of fiscal sustainability and the degree of technology integration.

Dr. Roger Y. Chao Jr., Head of the Education, Youth and Sports Division, Association of Southeast Asian Nations (ASEAN) Secretariat, introduced the history and common vision of ASEAN. He shared the organization's work plan and key focus areas in the field of education, analyzing opportunities and challenges in the digital transformation of education.

Dr. Cosmas Luckyson Zavazava, Director of the Telecommunication Development Bureau at the ITU, elucidated the significance of smart education for educational development. He introduced ITU's actions and initiatives in promoting connectivity and digital transformation in education, as well as efforts in building smart education partnerships.

Dr. Habibah Abdul Rahim, Director of SEAMEO Secretariat, shared two key consensus points among Southeast Asian countries in advancing digital transformation in education. One is the need to promote policy formulation and cultivate digital leadership among policymakers, and the other is to respond to local needs and encourage community participation.

In the segment covering country-specific case reports, representatives from European and Asian countries presented their respective explorations in rural education, education for rural transformation, and sustainable development.

Professor Vinayagum Chinapah, Professor Emeritus at Stockholm University, presented a vision of "digital education for all" and showcased the demands and expectations of stakeholders, especially those in rural areas, regarding digital education. He emphasized the importance of integrating sustainable development goals into the digital transformation for smart rural development.

Dr. Faiz H. Shah, Executive Director of the Yunus Centre at the Asian Institute of Technology, used the example of the "Trash Hero Movement" in Thailand to illustrate efforts to promote sustainable development by transforming people's attitudes and behavior through education.

Mr LIU Yunsheng, Dean of Chongqing Education Evaluation Institute, China, discussed the practical experience of providing international online course certification services for vocational colleges involved in the Belt and Road Initiative. He emphasized the role of such initiatives in promoting the development of skilled human resources and contributing to the construction of a human community with a shared future.

Mr ZHOU Wenke, Director of the Bureau of Education, Science and Technology, Ziyun Autonomous County, Guizhou Province, China, introduced the current status, construction goals, practical experiences, and the path of empowering rural teacher growth with smart technology in Ziyun County's rural teacher workforce. He suggested to use of the technology of "Cloud" to assist educational staff in breaking down and documenting annual objectives, fostering personalized growth among teachers, establishing a diversified evaluation framework, utilising an intelligent system to facilitate individual growth, categorize metric scores in adherence to scientific principles, and institute a regular prompt mechanism through an intelligent growth platform to promote lifelong development.

H.E. Mr Abdul Tawab Balakarzai, Former Acting Minister/Deputy Minister for Academic Affairs at the Ministry of Higher Education (MoHE) of Afghanistan, presented Afghanistan's efforts to achieve quality education for all and the recent crises and challenges faced. He called upon the international community under the leadership of the United Nations to collaborate in creating a more equitable, diverse, and inclusive education system.

Segment focusing on priority development regions

Dr. Abid Hussain, Senior Economist, International Centre for Integrated Mountain Development (ICIMOD) in Nepal, analyzed the major challenges faced by the Hindu Kush-Himalaya region in economic transformation. He proposed solutions centered on innovation and capacity building to adapt and transform mountain economies, thereby promoting sustainable economic development.

Dr. Ahmed Mohamed, Associate Professor at the Faculty of Education, Maldives National University, shared progress made in providing inclusive, equitable, inclusive, and high-quality education, improving people's life and work skills, advancing digital learning, promoting teacher development, and increasing public education financing.

Dr. Helio Brites da Silva, Lecturer at Faculty of Tourism and Hospitality, Dili Institute of Technology (DIT) in Timor-Leste, presented innovative practices in promoting local tourism industry development and economic growth through ecotourism.

Roundtable Discussion

During the forum, various stakeholders involved in empowering rural education through technology engaged in a roundtable discussion on topics such as typical cases and experiences of ICT applications, differences in digital literacy among urban and rural youth, promoting educational equity and fostering information literacy, and cultivating digital skills in vocational education. Four distinguished guests shared their thoughts and practical experiences on using technology to promote educational equity, enhance educational quality, and drive educational innovation. They are **Ms CUI Lifei**, Principal of Lide Experimental Primary School, Shijiazhuang City, China; **Dr. Indra Muis**, Rector of Bina Insani University, Indonesia; **Mr WANG Wenxiao**, Information Technology Teacher of Fengshuling Town Central Primary School, Chunan County, Hangzhou City, Zhejiang Province, China; and **Ms XIN Yanju**, General Manager Assistant of Forever Technology Co., Ltd, China.

圆桌嘉宾
Panelists
2023
全球智慧教育大会
Global Smart Education Conference 2023

Roundtable Discussion of Forum on Smart Village and Rural Education Transformation

Outcome Release

澜湄流域农业农村
发展特色案例研究

During the forum, a new book titled "Case Studies of Agricultural and Rural Development in Lancang-Mekong Countries" was released by **Dr. LU Yao**, Deputy Dean of International College of Yunnan Agricultural University and Deputy Director of China-ASEAN Education and Training Center, China. She introduced the efforts made by Lancang-Mekong countries in promoting agricultural and rural development in terms of agricultural development, rural capacity building, and rural sustainability. She called for collaborative efforts to build a beautiful home characterized by green development, education, ecological friendliness, innovation, community prosperity, and sustainable digital agriculture.

*The Forum on Smart Village and Rural Education Transformation is hosted by UNESCO IICBA, UNESCO INRULED, SEAMEO Secretariat, Educational Informatization Strategy Research Base (Northwest), Ministry of Education of P.R.China, and AIT. For more information, the video is available at https://wx.vzan.com/live/page/1622106796.

Forum on Smart Village and Rural Education Transformation
Key takeaways

- The topic of social enterprises holds particular significance for rural information technology and digital education. Our research has revealed that urban and rural schools occupy different positions when seeking partnerships. Urban schools are well-positioned to establish close partnerships with businesses, while rural schools face geographical challenges that make it difficult to forge such relationships with enterprises. In this context, social enterprises play a crucial role in enhancing society, especially in the case of rural schools, by enabling them to enter into a broader ecosystem through partnerships and serving as vital connectors.

- Technology can play a key role in transforming rural education, but bridging the digital divide between urban and rural areas is crucial. Initiatives such as providing internet connectivity to rural schools and promoting digital literacy can make a significant difference. It will help in reaching the Sustainable Development Goals and particularly SDG4.

- The sustainable development and innovation of rural education critically depend on symbiotic interactions among schools, families, and communities. Many organizations and governments are advocating for a new rural model to improve conditions in rural communities. This strategy entails granting local authorities autonomy, reforming governance, and prioritizing investments, emphasizing the importance of public-private and civil society partnerships, which are integral components.

- Reduce and/or eliminate digital divide through improved access to information and communication technology between individuals or communities, including between and within communities in rural areas

- Generative AI can provide personalized tutoring, answer questions, or offer learning materials to students in remote areas. This makes quality education accessible to those who might not have top-tier schools in their vicinity.

- Collaboration among rural schools and internet connectivity is indispensable for overcoming challenges through the sharing of best practices and experiences. Collaborating with urban schools, universities, and educational institutions is key to providing rural schools with much-needed expertise, funding, and innovative practices.

Forum on Technology-Empowered Educational Transformation

Facing the urgent need for high-quality education development and the complexity and uncertainty brought by the new generation of information technology led by artificial intelligence, the process of integrating technology and education still presents challenges. However, accelerating scenario-driven practical exploration has already opened a new gateway to digital education transformation.

Photo of Forum on Technology-Empowered Educational Transformation

Professor ZHOU Aoying, Vice President of East China Normal University, China, pointed out that digital transformation is an inevitable trend and a profound self-revolution. Digitalization involves data and intelligence, integrating internet thinking and data thinking into information technology. It is crucial to recognize the importance of data and empower education transformation with data. He believed that developing educational technology is the necessary path to achieve digital education transformation, using data and technology to drive this transformation and realize the vision of smart education.

Mr Richard Culatta, CEO of the International Society for Technology in Education, emphasized how to empower young people to thrive in the digital world in his report. He advocated building a "inclusive, informed, proactive, balanced, agile" relationship between humans and technology, collectively creating a new educational model that meets the demands of the times. He stressed the importance of teaching young people the principles and practical skills of AI, helping them use AI to find solutions to problems, while also nurturing human abilities that distinguish them from AI, such as empathy and compassion.

Dr. SHAN Zhiguang, Director of Department of Informatization and Industry Development, State Information Center, China, analyzed the trends and pathways of education digital transformation. He pointed out that smart education is not just the informatization of educational methods; it is the reshaping and reconstruction of educational methods in the "physical world,

SPEAKERS

Prof. ZHOU Aoying
Vice President, East China Normal University, China

Mr Richard Culatta
CEO, ISTE

Dr. SHAN Zhiguang
Director, Department of Informatization and Industry Development, State Information Center, China

Prof. Daniel Burgos
UNESCO Chairholder on eLearning

Prof. LIU Jun
Xi'an Jiaotong University, China

Mr Raúl Valdés-Cotera
Team Leader, UNESCO Lifelong Learning Policies and Strategies Programme, UIL

Prof. WU Chao
Director, Center for Computational Social Science Research, Zhejiang University, China

Prof. Diana Laurillard
University College London, UK

Prof. LI Yanyan
Beijing Normal University, China

Dr. QI Binbin
National Engineering Research Centre of Cyberlearning and Intelligent Technology, Beijing Normal University, China

Mr LIU Xiaojian
Executive President, OpenHarmony Program Working Committee

MODERATOR

Prof. WU Xia
Beijing Normal University, China

information world, and human society." Smart education must be education-centric, driven by data intelligence, and focused on human education and learning as its core. It should lead and adapt to smart education in the new era with more scientific and advanced approaches. He believed that the core of developing smart education lies in innovative concepts, data-driven approaches, intelligent optimization, and model reconstruction. It requires a genuine focus on demand, goals, and outcomes.

The report by **Professor Daniel Burgos**, UNESCO Chairholder on eLearning, focuses on the effective alignment of digital transformation with education and society. He pointed out that with the advent of new technologies, important factors for measuring teaching quality, such as academic assessments and teacher-student interactions, are undergoing changes. Transformation in the education sector is inevitable, and it should be approached with a proactive and open-minded attitude, emphasizing the need for corresponding capacity building.

Professor LIU Jun from Xi'an Jiaotong University delivered a keynote speech titled "Exploration and Practice of "Knowledge Forest Tutoring" Mode." He addressed issues arising from fragmented knowledge, such as cognitive overload, cognitive bias, and learning confusion. To tackle these problems, he proposed the establishment of a "knowledge forest model" for integrating fragmented teaching resources. He also showcased typical scenarios like "multi-level guided learning in the knowledge forest" and "HoloTable knowledge forest," along with combinable and interpretable "knowledge forest models" combined with large models. This aims to empower a human-machine integrated "teacher-machine-student" education model.

Mr Raúl Valdés-Cotera, Team Leader of the UNESCO Lifelong Learning Policies and Strategies Programme at the UNESCO Institute for Lifelong Learning, highlighted the significant disparities in internet accessibility and educational levels between regions and genders on a global scale. He emphasized the use of technology to address educational equity issues while underlining the importance of human care. The goal is to collectively build a new landscape for lifelong learning in the digital age, focusing on enhancing digital skills and awareness.

Professor WU Chao, Director of Center for Computational Social Science Research, Zhejiang University, China,discussed China's efforts to independently develop interdisciplinary fields in artificial intelligence within higher education. Notable achievements have emerged in areas such as AI+ scientific discovery and AI+ computational sociology. He shared Zhejiang University's exploration of cross-disciplinary talent development and introduces the new-generation artificial intelligence science and education innovation open platform, "Zhihai."

Professor Diana Laurillard from University College London analyzed the potential for educational transformation through collaborative digital teaching methods by teachers. She highlighted the challenges of technology, including the difficulty of effectively identifying invalid information in various aspects of active and social learning. She emphasized the need for teachers to take an active role in enhancing their teaching skills through collaboration, setting new goals and designing teaching activities with the help of new technology, and iterating continually through practice.

Professor LI Yanyan from Beijing Normal University pointed out the urgent need for intelligent upgrades in the learning environment to build a high-quality education system. This can be achieved by creating a comprehensive teaching environment centred on learners and delivering precise learning services. She stated, "Cross-domain synergy will support multi-dimensional monitoring of learning states, complete chain analysis of the learning process will aid precise teaching decisions, cross-domain integration will facilitate multi-granularity learner profiling, and human-machine collaboration will empower adaptive learning support and services."

Outcome Release

Mr LIU Xiaojian, representing the OpenHarmony Program Working Committee, introduced the OpenHarmony operating system. This system has become the root community for the next-generation intelligent terminal operating system. He shared scenario-based educational solutions leveraging OpenHarmony's features like distribution and virtualization technologies. He called upon educators and partners across the education industry nationwide to collaborate in building a secure, trustworthy, innovative, and digitally enabled foundation for smart education at the edge.

Dr. QI Binbin, representing the research team from the National Engineering Research Centre of Cyberlearning and Intelligent Technology, Beijing Normal University, China, unveiled the Construction Scheme for the New Generation Intelligent and Connected Classroom. This plan is built upon a cloud-edge collaborative technology architecture and is tailored to typical scenarios such as educational research, inquiry-based learning, field investigations, and more. It encompasses aspects like scenario descriptions, theoretical foundations, user journey maps, and the flowchart of technical support. He also issueda call for participation from the first batch of alliance schools.

Call for Applications: Smart Learning Environment Construction and Application Demonstration Alliance Schools

In alignment with China's development plan for the next generation of artificial intelligence and to support the national "Digital China" strategy as well as the goal of becoming an education powerhouse, the Research Group of the Key Technology Research and Application Demonstration for Intelligent Learning Environment Connectivity under the Ministry of Science and Technology's "Technology Innovation 2030 Major Project" is dedicated to advancing the intelligence of learning environments. This includes theoretical and technological research, the development of a smart learning environment computing engine, a scalable smart classroom monitoring platform, and the establishment of comprehensive teaching environments. Our aim is to create a self-controlled and secure intelligent learning environment connectivity solution. To facilitate the practical implementation of this project, we are now seeking applications from 20 alliance schools, including primary and secondary schools as well as vocational colleges.

Eligibility Criteria:

- Applying schools should actively promote digital transformation in education and possess a solid foundation in educational information technology. The infrastructure of the learning environment should be relatively well-established.

- Applying schools should have a strong foundation in using artificial intelligence to enhance education and have at least one year of practical experience in this field.

- Applying schools should have the necessary personnel, resources, and funding to effectively coordinate and engage teachers and students in the construction and application of the smart learning environment. This ensures the smooth progress of the pilot program.

- Applying schools should be capable of coordinating with information technology service providers and relevant platforms as needed to support data integration.

- We encourage eligible schools to apply and join us in advancing the intelligence of learning environments and promoting the normalization of artificial intelligence in education.

*The Forum on Technology-Empowered Educational Transformation is hosted by BNU and UNESCO IITE. For more information, the video is available at https://wx.vzan.com/live/page/1719618850.

Forum on Technology-Empowered Educational Transformation
Key takeaways

- Smart education necessitates a paradigm shift in ideology, driven by data, optimized through intelligence, and remodelled with a focus on utilizing next-generation information and communication technologies to reshape, reconstruct, reform, and reconfigure educational development paradigms. It calls for a spirit of self-revolution, necessitating the reinvention of scenarios, processes, management, and services.

- Smart education, anchored in education, driven by data. At its core, smart education revolves around a learner-centric approach, placing education and learning at the forefront. Employing advanced educational intelligence that is more scientifically sound, it guides and adapts to the new era of smart education.

- Data serves as the driving force behind educational transformation. When collecting and applying data, several key considerations should be consistently addressed. Firstly, the authenticity of the data collection process: Platforms need to gather accurate data seamlessly throughout a user's learning journey, ensuring data quality and reliability. Secondly, the establishment of a closed-loop system for data: The true value of data lies in problem-solving, and it can only enhance and refine the educational process when applied to real-life contexts. Finally, the alignment of data with personalized learning: Technologies like collaborative filtering should be utilized to provide tailored learning recommendations and support, thus better meeting the needs of each learner.

- A culture of digital lifelong learning should include ensuring access to learning technologies; establishing lifelong learning as a common good; placing vulnerable groups at the core of the lifelong learning policy agenda.

Concluding Comments and Follow-up Actions

During the three-day conference, renowned academicians, globally recognized experts and scholars, representatives from international organizations and government departments, frontline educators, and professionals from the business sector converged to engage in profound discussions centered around the themes of educational transformation and digital governance. The captivating speeches by the distinguished academicians and the intellectual collisions among the experts and scholars left us all with a sense of the innovative and cutting-edge nature of this conference.

Professor MO Yan from Beijing Normal University, Nobel laureate in literature, believed that artificial intelligence possesses powerful learning capabilities, serving as a massive platform that can synthesize previous achievements to create wisdom. Although it is currently unlikely for AI to completely replace the creative labor of writers and artists in the short term, it can indeed synthesize text that can be modified and utilized at the fastest pace, demonstrating astonishing abilities.

H.E. Dr. Susil Premajayantha, Minister of Education of Sri Lanka, provided an overview of his country's education development and initiatives aimed at transforming education through information technology. He stated that Sri Lanka's future education reforms would focus on several key areas: Digital Transformation for Smart Education, Artificial Intelligence assistance to promote more inclusive and equitable education, Curriculum reform in School Education for an Intelligent Era, Leveraging intelligent Technology for Education Innovation, and Technology Empowered Teaching (AI-assisted Teacher Development).

SPEAKERS

Prof. MO Yan
Winner of the 2012 Nobel Prize in Literature

H.E. Dr. Susil Premajayantha
Minister of Education, Sri Lanka

H.E. Ms Anamarija Viček
State Secretary of Ministry of Education, Serbia

Mr CHEN Wei
Vice Director, Department of International Cooperation and Exchanges (Office of Hong Kong, Macao and Taiwan Affairs), Ministry of Education, P.R.China

Prof. ZHOU Zuoyu
Vice President, Beijing Normal University, China

Prof. Asha S. Kanwar
President & CEO, COL

Mr Richard Culatta
CEO, ISTE

Prof. Mohamed Jemni
Director, ICT Department, ALECSO

Prof. ZHAN Tao
Director of UNESCO IITE

Prof. LIU Dejian
Co-Dean, Smart Learning Institute of Beijing Normal University, China

Prof. HUANG Ronghuai
Co-Dean, Smart Learning Institute of Beijing Normal University, China

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MODERATORS

Mr WU Yujun
Director, Office of International Exchange & Cooperation, Beijing Normal University, China

Ms CHEN Ying
National Engineering Research Centre of Cyberlearning and Intelligent Technology, China

H.E. Ms Anamarija Viček, State Secretary of the Ministry of Education of Serbia, shared her views on the digital evolution and transformation of education, along with Serbia's progress and experiences in digital governance. She emphasized their priority of strategically integrating digital technologies into educational methodologies to ensure a gradual and transformative shift towards high-quality blended and online education accessible to everyone.

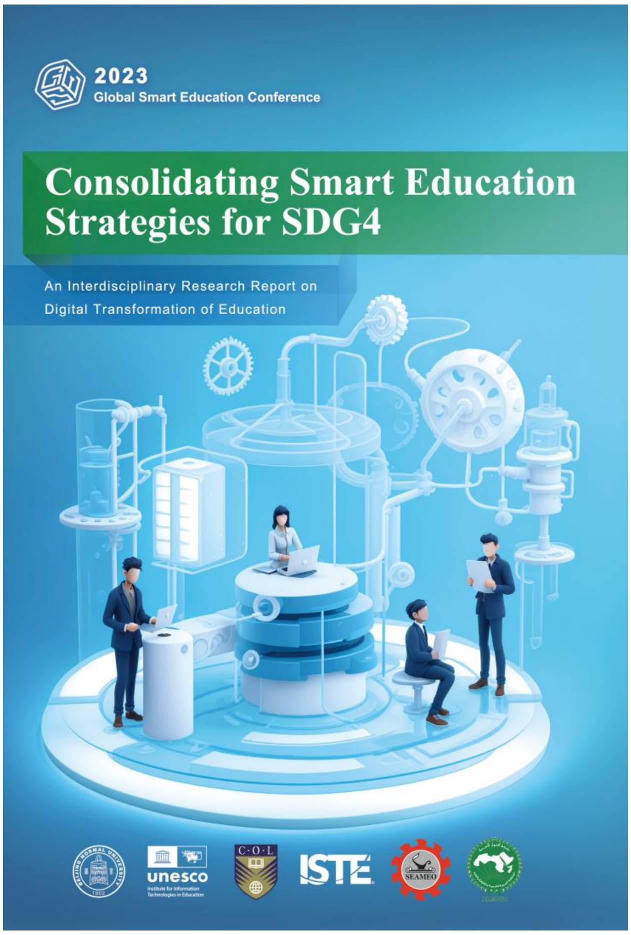
Mr CHEN Wei, Vice Director of the Department of International Cooperation and Exchanges (Office of Hong Kong, Macao, and Taiwan Affairs), Ministry of Education, highlighted that advancing digital education and digital governance is a global trend, a developmental necessity, and a direction for reform. He called for international collaboration among countries to explore planning, standards, monitoring and assessment of digital education, as well as cooperation in knowledge protection, data security management, digital ethics risk prevention, and privacy protection. He stressed the importance of collectively injecting new sources of energy into human civilization and contributing tirelessly to building a global community with a shared future for humanity.

Professor ZHOU Zuoyu, Vice President of Beijing Normal University, pointed out that digital transformation is a crucial vehicle and direction for education reform worldwide, and smart education will lead the way in the future. Beijing Normal University will continue to optimize its talent development system, enhance global competitiveness in research and academic innovation, establish a globally oriented social service system, increase the global influence of cultural dissemination, build a globally competitive teaching staff, and create a global network of outstanding cooperation.

Outcome Release: Consolidating Smart Education Strategies for SDG4 - An Interdisciplinary Research Report on Digital Transformation of Education

Professor HUANG Ronghuai, on behalf of GSENet, unveiled the collaborative findings of an interdisciplinary research endeavor titled "An Interdisciplinary Research Report on Digital Transformation of Education." This report is released in anticipation of the Global Smart Education Conference 2023 (in Beijing from 18 to 20 August) which aims to provoke discussion and discover solutions to today's challenges in education through high-level dialogues, pre-conferences, workshops, webinars and exhibitions. Past reports that guided the formulation of the current report include UNESCO, HSE, and BNU joint report (2022) titled *Analytical Report on the Global Innovations and Monitoring of the Status of Smart Education* and *Smart Education Strategies for Teaching and Learning: Critical analytical framework and case studies* jointly produced by UNESCO, COL, BNU and SLIBNU in 2022.

This report delves into smart education amidst the technology-in-education debate, advocating for a balanced perspective. It defines performative features and constructive features of smart education. The performative aspects spotlight student-centered teaching and learning, comprehensive assessment, smart learning environments, continuous improvement culture, and inclusivity. Constructive facets focus on fostering social learning communities, supporting educators, ethical technology adoption, sustainable reform, and effective collaboration. A global policy analysis assesses diverse approaches to achieve smart education, followed by insights drawn from worldwide public data. Real-world cases illustrate digital transformations in education. The conclusion offers actionable recommendations for smart education strategies in line with Sustainable Development Goal 4 (SDG4), promoting a holistic approach to digital education. Professor HUANG also released *GSENet Beijing Declaration on Smart Education Strategies,* followed by GSENet partners' responses.



2023
Global Smart Education Conference

Consolidating Smart Education Strategies for SDG4

An Interdisciplinary Research Report on Digital Transformation of Education

Partner Engagement

Professor Asha S. Kanwar, President & CEO of COL: Despite the warnings posed by artificial intelligence regarding the future of work, humanity will continue to be in demand for jobs that require higher levels of empathy, as well as roles that necessitate creativity and innovation. Let us ensure that our learners acquire three essential competencies:

- Human Literacy: This prepares students to excel in tasks that are uniquely human, aiding them in making ethical decisions.
- Data Literacy: In an indispensable skill, learners must be capable of distinguishing between truth and falsehood.
- Technical Literacy: Proficiency in both software and hardware is of utmost importance for learners.

These competencies will equip individuals with the skills needed to thrive in an evolving job landscape.

Mr Richard Culatta, CEO of ISTE: When addressing the digital divide, we must focus on bridging the technological gap by actively embracing technology and contemplating pivotal issues, particularly when discussing artificial intelligence (AI). We must ensure that students gain a comprehensive understanding of the essence of AI and how to effectively integrate it into a working environment where human-AI collaboration is prevalent upon graduation.

Additionally, we must exercise caution when dealing with errors and decision-making, as biases may exist within systems. It is essential to identify tasks that are not suitable for AI to prevent potential biases. Furthermore, a reassessment of the value of human skills is warranted. Over the past century, humans have acquired numerous technological capabilities; however, it is now incumbent upon us to reconsider which skills possess unique significance. Shaping the framework of learning, education, and educational institutions to impart these distinctive skills to students is of paramount importance. This involves more profound and comprehensive approaches to education, encompassing qualities such as empathy, creativity, experiential learning, and others, rather than mere mechanical replication and duplication.

Professor Mohamed Jemni, Director of ICT Department, ALECSO: ALECSO is committed to advancing global and regional smart education initiatives, particularly within the Arab region, encompassing the utilization of smart education in 26 countries. We are privileged to collaborate with partners from the Global Smart Education Network. The declarations resulting from these collaborations will soon be translated into Arabic, and I eagerly anticipate receiving recommendations from our alliance.
We aspire to achieve sustainable development goals through collaboration. These objectives are not only at the national level but also global in scope. Continuous efforts to drive cooperation are essential, and this is a goal that merits our dedication. We hope to promote global cooperation and work towards this end.

Professor ZHAN Tao, Director of UNESCO IITE: During the conference, we discussed technology, and I believe we are very fortunate to have the opportunity to fully harness advanced digital technology. We are currently in a new digital era, and without the emergence of these intelligent technologies, achieving sustainable development goals would be challenging. We firmly believe that digital technology has brought about a revolutionary transformation, one with profound implications that can drive our transition. This includes better equipping us to address challenges, such as the significant digital divides and disparities faced by some countries. Of course, addressing these issues is beyond the capacity of individual efforts alone, but as a global network, we can collaborate effectively to overcome these difficulties.

In my view, we have not only become smarter but also more powerful and confident. As mentioned by previous speakers, in addition to the technological divide, there is also a divide among people, which may be equally significant. Currently, there are substantial differences and gaps among us, but I believe that through cooperation, as a collective, we can achieve more goals. Through collaboration, we can bridge the gaps and differences between individuals, offering not only hope but also a brighter future. We are committed to promoting equal education and are confident in driving the development of smart education together with all of you.

全球智慧教育大会
Global Smart Education Conference

Photo of GSENet Partners

Award Ceremony: The 6th Global Competition on Design for Future Education

2023
第六届全球未来教育设计大赛
The 6th Global Competition on Design for Future Education
Partners
niversities

During the Closing Ceremony, Gold Award, Silver Award and Bronze Award were presented to the students.

- Project: ‘Little Cubey and His Shadow’——Design of multimodal picture book for dyslexic children with the theme of light and shadow

- Project: Visualized map WEBSITE and Learning APP "Our World" & DESE(Design Everything for Smart Education)

- Project: Ai CARE CAM - Intelligent CCTV system generates daily report of each children for efficient workflow of Kindergarten teachers, iNature: Engage with Nature from the View of Animals & The Exploration of Immersive And Interactive Environment In Public Art Education

Acknowledgements to Enterprise Supports

一起
Bai du 百度
科大讯飞 iFLYTEK
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网龙华渔教育
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At the Closing Ceremony, in gratitude for the generous support of the enterprises towards the conference, certificates of appreciation were presented to each of them.

Conference Summary

Professor LIU Dejian, Co-Dean of Smart Learning Institute of Beijing Normal University, expressed that over the past eight years since the establishment of the Smart Education Research Institute by NetDragon and Beijing Normal University, both parties have been committed to conducting research that contributes to human education. They have combined the rapid development of digital technology with the profound transformation of global education, pondering the questions, "What is education? Where should education be heading?" He said: "I believe that the digital transformation of education needs to be planned from a strategic level, expand the coverage of personnel, expand the spatial network that can learn everywhere, extend the time scale of real-time learning, and build a learning society that meets the sustainable development of comprehensive lifelong learning, which is also the idealized education we have been pursuing, a future-oriented education that takes learners as the starting point of consideration, is always worthy of our pursuit of the correct educational concept model and thinking, and is the North Star that guides us to do education." He also called upon stakeholders in education to dedicate themselves to ensuring that quality education and lifelong learning can be provided to more people worldwide as a shared interest and human right.

With the theme of education transformation and data governance, the conference responds to the needs of the times and provides us with a communication platform to strengthen data governance in the intelligent era and promote the digital transformation of education, which is of great significance. **Professor HUANG Ronghuai**, Co-Dean of Smart Learning Institute of Beijing Normal University, highlighted several key features of this year's Global Smart Education Conference in his conference summary. These included open organization, open solicitation of keynote speakers, smart education case studies, volunteers, conference theme songs, and participating companies. The conference also featured a diverse range of activities and saw the participation of 105 international guests from 40 countries, 202 domestic guests, and over 1,600 attendees in total. It provided a platform to listen to voices from education practitioners, offered students a stage to showcase their talents, and served as a gathering point for global education wisdom, leading to the release of multiple achievements. He concluded: "We take this conference as an opportunity to join hands to deepen exchanges and cooperation, jointly create a better tomorrow of smart education that takes care of all mankind, and strive to achieve the global sustainable development goals to build a better world."

刘德建
北京师范大学智慧学习研究院联席院长
网龙网络公司董事长

黄荣怀
HUANG Ronghuai
北京师范大学智慧学习研究院联席院长，教授
Professor, Co-Dean of Smart Learning Ins e of
Beijing Normal University, Chi
全球智慧教育大会
Global Smart Education Conference

*The Closing Ceremony is hosted by BNU and UNESCO IITE. For more information, the video is available at https://wx.vzan.com/live/page/1719618850.

The 6th Global Competition on Design for Future Education

From August 18th to 20th, the 6th Global Competition on Design for Future Education, jointly organized by Beijing Normal University and the UNESCO Institute for Information Technologies in Education, was successfully held at the Changping campus of Beijing Normal University. This competition focused on themes such as "Artificial Intelligence and Education, Metaverse and Education, Rural Education, Inclusive Education, Artificial Intelligence, Big Data, and Psychology." It featured two tracks for university students and primary/secondary school teachers. The goal was to design effective and comprehensive solutions for future education from the global perspective of university students and to showcase how primary/secondary school teachers worldwide envision the future of education through their teaching practices.

2023
第六届全球未来教育设计大赛
The 6th Global Competition on Design for Future Education

Group Photo of Participants

Intense Competition and International Collaboration

The final competition of the university student track spanned three days. In the 48-hour team educational project design competition, 111 participants from different countries and universities, including China, Vietnam, South Korea, Japan, the United Kingdom, Italy, and more, formed 20 teams. They collaborated across borders and divided tasks to design educational projects, combining online and offline modes of work. Eleven mentors from various fields, including education, design, artificial intelligence, and psychology, provided guidance through in-person meetings and online conferences. The first and second days of the competition featured intense group matches and playoffs in the evenings. Each team had a limited time of 5 minutes to introduce their project using methods such as PowerPoint presentations, video demonstrations, and physical exhibits. The mentor team provided real-time scoring and evaluation. Ultimately, 10 teams out of the 20 participating teams advanced to the final presentation.

Fun Activities for Relaxation and Enjoyment

In addition to the intense competition, the university student track participants engaged in a variety of fun and leisure activities. Prior to the competition, they had the opportunity to introduce themselves and showcase their talents. During the "Morning Exercise Check-In," they experienced the art of Chinese Tai Chi. They also shared their competition experiences and anecdotes in the "My Story with the Competition" activity and created unique handcrafted works in the "drawing and Handicraft" activity.

Final Presentations and Defense of Results

On August 19th and 20th, the final evaluations and presentations were conducted separately for the primary/secondary school teacher track and the university student track. The 10 finalist teams from the university student track and the 20 selected teacher cases from the primary/secondary school teacher track took turns presenting their projects. University students proposed innovative design solutions addressing real-life education issues, including supporting marginalized groups, promoting art education, and enhancing learning experiences. Primary/secondary school teachers shared and discussed various educational practices related to art education, deep integration of artificial intelligence and education, and the psychological well-being of adolescents. Experts from universities, research institutions, and enterprises provided detailed feedback on each case and work, resulting in awards for the top university student teams and primary/secondary school teacher awards.

DESE (Design Everything for Smart Education)
STS
GPT
13:37:18
胡路明
徐鹏飞

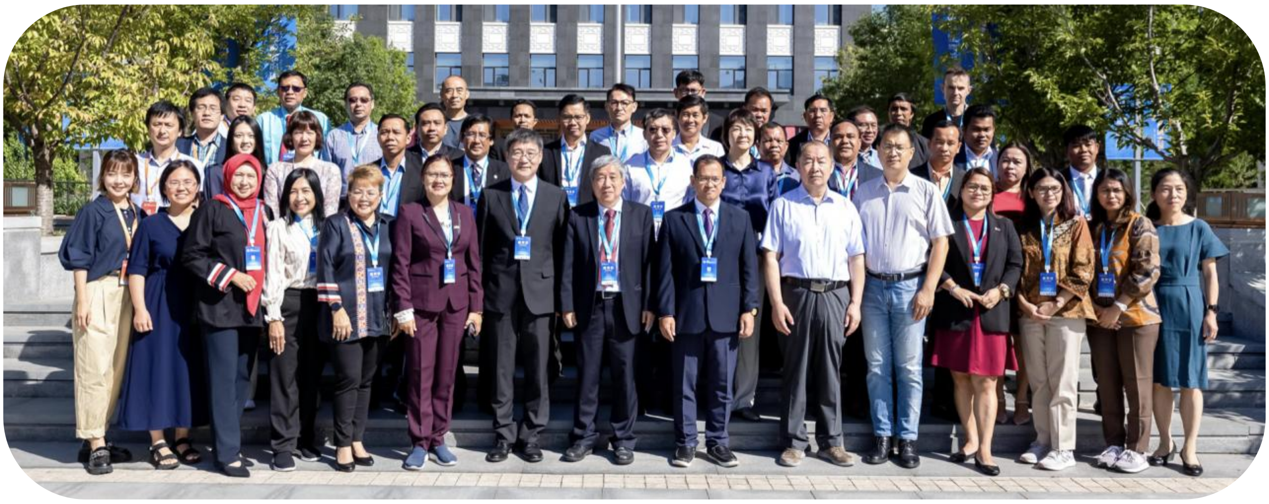
Summary

After three days of intense competition, participants crafted remarkable educational design solutions, contributing their efforts to the future development of education. While this year's competition has come to a close, the journey of education development continues. We look forward to next year's competition, where even more participants will contribute better outcomes.

TVET Leadership and Management Benchmarking Programme

In order to promote the social, economic, educational and cultural development of China and Southeast Asian countries, and deepen the cooperation between the two sides in the field of vocational and technical education and training, a series of the TVET Leadership and Management Benchmarking Programme and training workshops were held in Tianjin and Beijing in China from 14-20 August 2023.

The event was co-sponsored by China Education Association for International Exchange (CEAIE), Beijing Normal University (BNU), Tianjin Municipal Education Commission (TMEC) and Southeast Asian Ministers of Education Organization Regional Centre for Technical Education Development (SEAMEO TED), and executively co-organized by UNESCO Chair on AIED at Beijing Normal University, UNESCO International Research and Training Centre for Rural Education (UNESCO INRULED) and Tianjin Light Industry Vocational Technical College (TLIVTC), which was participated by more than 30 officials from education departments, directors, principals and managers of vocational schools from 8 Southeast Asian countries, namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand, Timor-Leste and China, for a 7-day benchmarking programme and consist of field visits, seminars, training workshops and cultural activities.



Group photo of guest speakers and participants of Benchmarking Programme (Beijing)

As a highly anticipated event of the TVET Leadership and Management Benchmarking Programme, the "Training Workshop on Vocational Education and Digital Technology Applications" was held at Beijing Normal University's Changping Campus from August 18th to 19th. The gathering brought together school principals from vocational and technical education institutions in Southeast Asian countries. Hosted by the UNESCO Chair on AI in Education (also referred to as the AIED Chair), the workshop aimed to address the United Nations Sustainable Development Goals in Education (SDG4) by exploring innovative ways to use digital technology for a more effective and flexible TVET system.

In early 2023, Beijing Normal University will establish the AIED Chair to promote research, training, and information sharing of information technology, particularly artificial intelligence, in the education sector. The chair's main objectives include fostering collaboration between Beijing Normal University and distinguished researchers and teaching staff from prestigious universities and institutions worldwide.

The Training Workshop on Vocational Education and Digital Technology Applications was attended by more than 50 participants from eight Southeast Asian countries, China and beyond. The event was graced by the presence of esteemed guests such as Professor CHEN Guangju, Vice Director of School Affairs Committee and Vice President of Alumni Association of BNU, Dr. Songheang Ai, Director of SEAMEO TED, Prof. Dr. Libing WANG, Director a.i., Chief of Section for Educational Innovation and Skills Development (EISD), UNESCO Multisectoral Regional Office in Bangkok, Thailand, and Prof. Maqun WU, former Dean of Beijing Information Vocational and Technical College. The workshop was moderated by Associate Professor Rongxia ZHUANG and Assistant Researcher Huanhuan WANG, both from Beijing Normal University. The event included keynote speeches, case presentations, round table discussions, and a call for cooperation initiatives.

Workshop venue for vocational education principals in China and Southeast Asian countries (Beijing)

At the workshop, Professor CHEN Guangju of Beijing Normal University and Dr. Songheang Ai, Director of the SEAMEO TED, delivered welcome speeches. They both emphasized the importance of international exchanges and cooperation in promoting vocational education. They expressed their desire to share practical technologies and experiences through extensive and in-depth cooperation among education departments, universities, and enterprises across various countries. This, they believe, will expand international exchanges and improve the teaching level of vocational education, ultimately contributing to the promotion of economic development and industrial transformation in China and Southeast Asian countries. During the workshop, Beijing Normal University and the SEAMEO TED signed a memorandum of understanding to continue promoting and deepening research, exchanges, and cooperation in the field of vocational education between China and Southeast Asian countries.

During the keynote speech session, scholars and industry experts gathered to discuss the current state shared how digital technology can enhance education quality, cater to diverse student needs, and facilitate vocational education transformation. Esteemed speakers included Wang Libing, Acting Director of the UNESCO Bangkok Multi-sector Regional Office, Daniel Burgos, moderator of the UNESCO eLearning Chair, Prof. Maqun WU, a National Vocational College Teacher Principal Training Expert Working Group expert, Professor Vinayagum Chinapah from Stockholm University, Chen Wenxuan, an Assistant Researcher at Zhejiang Laboratory, Neil Selwyn, a professor from Monash University, Dr. Bin BAI, Deputy Director of the Institute for Vocational and Continuing Education Research at Beijing Normal University, Dr. Jinbao ZHANG, Assistant Dean of the Science Education Research Institute at Beijing Normal University, and Ms Hongyan KUAI, Director of the Design and Learning Laboratory at the Smart Learning Institute of Beijing Normal University. The exchange of ideas between these experts made for an insightful session on the future of vocational education.

During the case study presentation, representatives from various enterprises shared insightful case studies that demonstrated the ways digital technology can be employed to advance vocational-technical education and training. They highlighted how technologies such as artificial intelligence can be leveraged to enhance learning outcomes and increase employment prospects for students. The use of interactive training and evaluation systems, which utilize ubiquitous multimodal technology, was also discussed as an effective way for students to master professional skills. Furthermore, the group discussed the use of artificial intelligence and virtual simulation to cultivate high-quality skills for skilled personnel.

In a round table discussion, participants from China and eight Southeast Asian countries gathered to discuss the challenges currently faced by vocational education development in Southeast Asia's digital age. During this discussion, participants identified various issues, including inadequate infrastructure hindering quality teaching, course content that doesn't align with job market needs, and difficulty in finding employment for graduates. The group also noted a shortage of capable teachers and a lack of sufficient opportunities for vocational and technical education and training. To tackle these challenges, participants shared examples of how information and digital technology can be effectively employed to promote the development of vocational and technical education and training.

Upon the conclusion of the workshop, the UNESCO Chair in Artificial Intelligence and Education extended a collaborative invitation to stakeholders from Southeast Asian countries, China, and global vocational and technical education and training. The proposal aims to establish a social experiment community that focuses on AI education applications. The primary objective of this initiative is to explore and research the integration of new technologies in educational scenarios on a global scale. Ultimately, this will lead to an improvement in teaching quality for all students.

Furthermore, the workshop attendees had the opportunity to visit the China Education Association for International Exchange (CEAIE) and participate in the Global Smart Education Conference (GSE 2023). Some representatives also had the privilege of presenting at the conference. It is reflected that this event played a critical role in fostering educational and cultural exchanges between China and Southeast Asian countries, which also laid the groundwork for future cooperation, innovation, and development in vocational education between both parties.

Smart Education Exhibition

The conference hosted on-site exhibitions for industries and companies, educational institutions, and research organizations in the field of smart education to showcase intelligent educational equipment, systems and platforms, tools and software, digital resources, integrated solutions, cases, projects, and research achievements.

探究猫
数字化实验室实验图例

Appreciation for Enterprise Supports

网龙华渔教育

China unicom中国联通

科大讯飞 iFLYTEK

紫光集团 TSINGHUA UNIGROUP
紫光智慧教育

H3C
数字化解决方案领导者

Bai du 百度

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腾讯教育
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OUR SCHOOL

Purity in ZiXi
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Rokid
AR时代引领者

KingSha

Partners of GSE2023

Beijing Normal University (BNU) is a National Key University directly under the administration of the Ministry of Education, P.R.China. It is a well-known university characterized by teacher education, educational science and basic disciplines in sciences and humanities.

The UNESCO Institute for Information Technologies in Education (UNESCO IITE) was established as an integral part of UNESCO by the General Conference of UNESCO at its 29th session (November 1997). IITE is the only UNESCO Category 1 Institute with a global mandate for ICT in education.

Smart Learning Institute (SLI) is affiliated to Beijing Normal University, and serves as an experimental platform comprising scientific research, technology development and education, which is jointly constructed by Elernity and its parent firm Netdragon Websoft Inc. SLI focuses on researching learning patterns under ICT environments, designing smart learning environments and building platforms that enable life-long learning and support the various, personalized and differentiated learning styles of digital learners.

Faculty of Education (FOE) is an organic teaching and research unit of Beijing Normal University. The missions of FOE are to improve the quality of educational innovation nationwide, to educate and prepare professional teachers and future educators, to house the think tank in education, to offer opportunities for International educational exchange and to facilitate the building of the educational and cultural industry in China.

Faculty of Psychology of Beijing Normal University is a world-class psychology discipline construction unit in China. It is also the only National Key Disciplines unit with a first-class psychology discipline.

China Institute of Education and Social Development (CIESD) is a new type of university think tank that focuses on innovation in educational policies and social governance. The Institute adheres to a high-standard orientation and high-quality development. It faces major national strategies, regional development and the academic frontier, aiming to provide consulting and assisting in politics with high-quality achievements.

CIT was constructed according to Notice from the General Office of NDRC in 2017. It is organized by Beijing Normal University and jointly constructed by Tsinghua University, China Mobile Communications Corporation(CMCC), Elernity and iFLYTEK CO.LTD. In 2021, It has passed the acceptance and optimization integration evaluation organized by the NDRC and the Ministry of Education, and been included in the new sequence management of the National Engineering Research Center. It has become an important part of the national scientific and technological innovation system.

The Arab League Educational, Cultural and Scientific Organization (ALECSO) is a Tunis-based specialized institution working under the umbrella of the League of Arab States. It is essentially concerned with the development and coordination of the activities related to education, culture and sciences in the Arab World. It includes 22 Member States.

Commonwealth of Learning (COL) is an inter governmental organization created by Commonwealth Heads of Government in 1987 to promote the development and sharing of open learning and distance education knowledge, resources and technologies.

The International Society for Technology in Education (ISTE) is a nonprofit organization that has global members in the field of Education Technology. It is the home to a passionate community of global educators who believe in the power of technology to transform teaching and learning, accelerate innovation and solve tough problems in education. ISTE's vision is that education innovators are supported in reimagining and redesigning learning with a focus on using technology to create transformational and equitable experiences for learners.

The Southeast Asian Ministers of Education Organization (SEAMEO) is a regional intergovernmental organization established in 1965 among governments of Southeast Asian countries to promote regional cooperation in education, science and culture in the region.

Collaborative Innovation Centre of Assessment for Basic Education Quality was established in July 2012 and was officially recognized by the Ministry of Education in October 2014. It is the only national-level collaborative innovation center in the fields of education and psychology in China.

State Key Laboratory of Virtual Reality Technology and Systems is one of the earliest units in China to conduct research and applications in virtual reality technology. After years of development and construction, it has formed a distinct advantage in interdisciplinary team collaboration, combining military and civilian backgrounds, emphasizing both theoretical research and system development, and bridging technological breakthroughs with industry applications.

Strategic Research Base of Education Informatization (Central China), Ministry of Education, P.R.China, relying on Central China Normal University, undertakes multiple functions such as policy analysis, performance evaluation, decision support, consulting, and training related to educational informatization.

Strategic Research Base of Education Informatization (Beijing), Ministry of Education, P.R.China., relying on Beijing Normal University, focuses on strategic research in the development of smart education, application of artificial intelligence in education, and international comparative studies on educational informatization.

Strategic Research Base of Education Informatization (Northwest), Ministry of Education, P.R.China., relying on Northwest Normal University, concentrates on strategic research in areas like the construction and application of online learning spaces and educational informatization in ethnic regions.

Founded in 1954, Capital Normal University is one that covers literature, science, industry, management, laws, education, foreign languages and arts. It is a university jointly built by Beijing Municipality and the Ministry of Education, P.R.China.

The Longhua Education Bureau implements national, provincial, and municipal laws, regulations, and policies related to education, formulates development plans and annual plans for the education industry in the district, formulates education and teaching reform plans, and implements them after approval.

Founded in 1959, Asian Institute of Technology (AIT) has now developed into one of the largest international graduate schools in Asia funded by governments, international organizations, foundations, business institutions, and individuals from many countries and regions around the world.

Founded in 1957, the China Academy of Information and Communications Technology (CAlCT) is a scientific research institute directly under the Ministry of industry and information Technology (MlIT) of China. It adheres to the development positioning of "a specialized think-tank for the government and an innovation and development platform for the industry". This enables CAlCT to play a supporting role in major strategies, planning, policies, standards, testing and certification related to the ICT sector.

The World Broadband Association (WBBA) is a multilateral, industry-led association, providing leadership for digital broadband across the next decade. Its objective is to overcome industry challenges and support the drive towards the provision of broadband networks and services for all. With a goal of accelerating the healthy development of the industry, with sustainable benefits for stakeholders, end users, and society.

Founded in July 1981, China Education Association for International Exchange (CEAIE) is a national organization in the Chinese education community that conducts non-governmental international educational exchanges and. It is active in developing exchanges and cooperation between the Chinese educational community and other parts of the world, promoting the advancement of education, culture, science and technology, and strengthening understanding and friendship among the peoples of all countries and regions of the world.

China Educational Equipment Industry Association (CEEIA) is a national and industrial non-profit social organization formed by voluntary personnel from corporations and institutions that engage in the production, operation, management, and research within the educational equipment industry.

Founded in 2015, Beijing Design Society (BDS) is an academic non-profit social organization jointly initiated by workers, units, and organizations engaged in scientific research, education, development, production, application, and services in the field of design and related technology and culture, and approved and registered by the Beijing Municipal Social Organization Registration Administration.

China Information Technology Education magazine was founded in 2002 and is a central-level publication supervised by the Ministry of Education of the People's Republic of China and organized by the National Center for Educational Technology, among others.

Smart Education Empowers Lifelong Learning for All
-Based on GSE2023 Perspectives

Abstract

As a new form of education in the digital age, smart education is an inevitable choice for advancing high-quality education with fairness and inclusivity and ensuring lifelong learning opportunities for all. The Global Smart Education Conference serves as a crucial platform for international society to facilitate smart education exchanges and collaborations. This paper extracts insights from the Global Smart Education Conference 2023 to outline the blueprint and advancement pathways for smart education. Smart education represents the desired form of education digitization, with its core proposition being the cultivation of top-tier innovative talent. The integration of science and education serves as the driving force behind innovative development in smart education, while data governance provides a thoughtful approach to the orderly transformation of the education system. Digital transformation forms the practical foundation for shaping regional smart education ecosystems, and international cooperation paves the way towards a brighter future for global education.

Keywords: Smart education, educational transformation, data governance, technological empowerment, lifelong learning.

Global education faces severe challenges and a learning crisis, with digitalization being a significant breakthrough in opening new pathways for educational development and shaping new advantages. The irresistible wave of digital transformation in education has made innovative development in smart education an inevitable choice for global educational reform. To enhance international dissemination, exchange, and cooperation in the field of smart education, from August 18th to 20th, 2023, Beijing Normal University, in collaboration with the UNESCO Institute for Information Technologies in Education (UNESCO IITE), hosted the "Global Smart Education Conference 2023." More than 300 distinguished speakers, including representatives from international organizations such as UNESCO, the Arab League Educational, Cultural and Scientific Organization (ALECSO), the Commonwealth of Learning (COL), the Southeast Asian Ministers of Education Organization (SEAMEO), the Organisation for Economic Co-operation and Development (OECD), the Asia-Pacific Economic Cooperation (APEC), the International Telecommunication Union (ITU), the Association of Southeast Asian Nations (ASEAN), and the International Society for Technology in Education (ISTE), as well as experts, scholars, education policymakers, and frontline educators and students from both domestic and international educational and technological sectors, participated in 16 thematic forums and 3 parallel activities, collectively sharing new theories, technologies, perspectives, and achievements in smart education from multiple angles, domains, and dimensions, under the overarching theme of "Education Transformation and Data Governance."

1 Smart Education as the Target Form of Educational Digital Transformation

As the new wave of technological revolution and industrial transformation continues to advance, digital technologies are increasingly becoming the driving force behind fundamental changes, comprehensive reshaping, and a guiding power for human societal thinking patterns, organizational structures, and operational models. This has presented significant opportunities for innovation, reshaping, and development, but it has also brought forth new challenges. The question of "What is education, and where should education be headed?" has become a shared concern for countries worldwide. **H.E. Mr CHEN Jie**, Vice Minister of Education of P.R.China and Chairperson of the National Commission of the People's Republic of China for UNESCO, pointed out that as a new form of education in the digital age, smart education is an inevitable choice for advancing high-quality education with fairness and inclusivity and ensuring lifelong learning opportunities for all. Smart education expands the coverage of "learning for all," widens the spatial extent of "learning everywhere," and extends the time dimension of "learning anytime." This objective necessitates a clear understanding of its intrinsic characteristics and calls for strategic-level systematic planning to implement comprehensive digitalization processes across all elements, processes, functions, and fields within the education system.

1.1 Intrinsic Features of Smart Education

The academic community is currently engaged in intense discussions regarding the theoretical construction of smart education, to promote its broader, larger-scale, higher-quality, and more efficient benefits for lifelong learning. **Professor HUANG Ronghuai**, in his book titled "Future Education Empowered by Artificial Intelligence," presents an educational perspective for the intelligent era, encompassing a knowledge view of collective creation and sharing, a learning view of intelligent collaboration construction, a curriculum view of flexible openness, and a teaching view of human-computer synergy. In his report titled "Consolidating Smart Education Strategies for SDG4 - An Interdisciplinary Research Report on Digital Transformation of Education," he outlines the new features of smart education, including the critical performative features of national or regional smart education ecosystems, referred to as the "development goals." These encompass student-centred teaching and learning, whole student learning assessment, smart and ubiquitous learning spaces, cultivating continuous improvement culture, and commitment to inclusion and equity in education. The second feature pertains to the auxiliary constructive features of the smart education system, referred to as the "practice path." These encompass the social learning communities for students, ethical adoption of ICT in education, prioritizing teacher professional development, sustainable plan for education reform, and effective multi-sector collaboration.

As an internationally representative viewpoint, **Professor Asha S. Kanwar**, President of the Commonwealth of Learning (COL), believes that smart education should be enjoyable, engaging, efficient, effective, and ethical. She identifies four essential features of smart education: it must be meaningful, providing opportunities for livelihoods; it should provide channels for the use of technology to even the most vulnerable and marginalized groups in society; it must be prepared for any future disasters or shocks; and smart learning should be transformative, fostering independent thinkers.

Regarding the functional orientation of smart education, **Professor ZHU Zhiting** emphasizes that smart education should create a technology-integrated ecological learning environment, using data intelligence, teaching intelligence, and cultural intelligence to provide learners with intelligent learning, intelligent assessment, and intelligent services. Regarding the critical focus of smart education, **Dr. SHAN Zhiguang** points out that smart education represents a transformation and upgrade of educational approaches. The essence of smart education lies in the construction of digital education, interest-based education, psychological education, and talent development. The core of developing smart education involves innovative thinking, data-driven approaches, intelligent optimization, and model reformation. It utilizes next-generation information technology to reconstruct teaching paradigms, achieve the reformation of scenarios, businesses, and services, and lead education intelligently in the new era.

Concerning the extension of smart education, **Academician ZHANG Jun** redefines "green education." This involves the comprehensive perception of smart education through data collection technologies, knowledge graphs, metaverse, and large models. This data collection operates on three levels: teaching resources, behavioral states, and learning outcomes. It realizes the knowledge-driven nature of smart education by systematically associating fragmented knowledge, summarizing and innovating systematic knowledge. Smart education's immersive renewal is achieved through the design of immersive, interactive, scenario-based, and gamified learning. Innovative learning is realized by designing diverse learning paths and reforming and innovating models. **Professor CHEN Li**, in an academic context, elucidates the basic principles, philosophical ideas, and pedagogical laws of "Internet + Education." She believes that "Internet + Education" is a new form of education based on the renewal of educational concepts, the transformation of educational models, and the promotion of educational innovation and development through the updating of new-generation information technologies. It represents the historical process of the transformation of human education from two spaces to three spaces, the reconstruction of educational teaching processes, organizational systems, and governance systems, and its innovative forms are reflected in six aspects: new spaces, new concepts, new models, new formats, new elements, and new systems.

Interpretations of the intrinsic and extensional aspects of smart education by experts and scholars from different fields reflect not only the features of the smart education era and its technological relevance but also the varying discursive expressions of smart education in different policy and theoretical systems. However, the core of these interpretations lies in the deep integration of information technology with educational teaching and learning.

1.2 Strategies for Advancing Smart Education

The world is currently undergoing unprecedented changes, with rapidly evolving intelligent technologies opening new horizons for education. Education must accurately recognize change, proactively seek change, and adapt positively to change. **H.E. Mr CHEN Jie** emphasized that developing smart education is a significant endeavor in educational reform, one that requires substantial investment, has far-reaching consequences, and demands systematic planning, as well as scientifically informed strategies, and effective policy measures. China has initiated its strategy for educational digitization, and the

National Smart Education Platform has gathered the nation's highest-quality digital educational resources, benefiting 291 million students and a vast number of lifelong learners. This platform has also been recognized as an exemplary digital learning public gateway, earning the 2022 UNESCO King Hamad Bin Isa Al-Khalifa Prize for the Use of Information and Communication Technologies (ICTs) in Education.

Smart education represents the future development direction of education in the era of intelligent technology. The challenge of how to advance educational digital transformation and how to construct a smart education ecosystem is a shared challenge and a significant opportunity for countries around the world.

(1) **H.E. Mrs Leela Devi Dookun-Luchoomun**, Vice Prime Minister and Minister of Education, Tertiary Education, Science and Technology of Mauritius, highlighted the persisting inequalities, particularly in countries of the Southern Hemisphere, especially sub-Saharan Africa, where the digital divide remains a tangible obstacle. Mauritius is leveraging digital technologies, such as portable educational applications, massive open online courses, stackable modules, and micro-credentials, to provide more people with access to high-quality educational content. This initiative aims to provide robust support for sustained economic growth, increased employment opportunities, and enhanced social welfare. She emphasized that human well-being should remain the central focus during digital transformation, and human intelligence and artificial intelligence should coexist harmoniously, mutually reinforcing each other.

(2) **H. E. Dr Susil Premajayantha**, Minister of Education of Sri Lanka, shared the exploration of ICT technology-driven educational transformation, focusing on Smart Education and ICT application and integration in education. He believed that policies for digital transformation play a crucial role, and smart education would undoubtedly significantly promote educational digital transformation.

(3) **H.E. Mr Azat Atayev**, Deputy Minister of Education of Turkmenistan, explained how Turkmenistan is advancing education reform through the formulation of a "Digital Education Development Strategy." New measures include the enactment of normative legislation, the creation of e-learning platforms, the application of teaching methods involving the integration of new technologies, and the use of data analytics to support educational decision-making. He emphasized the importance of focusing on the structure of educational data, identifying and discovering clusters, and strengthening network analysis of the "digital footprint" and educational data analysis in personal digital records for intelligence development forecasting.

(4) **H.E. Ms Anamarija Viček**, State Secretary of the Ministry of Education of Serbia, outlined Serbia's digital education initiatives based on the Education Development Strategy 2030. These initiatives encompass the development of digital competencies for teachers and students, digitally supported teaching methods, and the digitization of administrative management systems within the education system.

(5) **Mr Mahmoud Zouaoui**, Chief of the Staff of the Ministry of Higher Education and Scientific Research of Tunisia, presented the country's higher education digital platform project and education information

system. These initiatives not only enable researchers, teachers, and students to better utilize technology for learning, resource optimization, and bridging the digital divide but also assist policymakers and teachers in making informed decisions, enhancing educational quality, and fostering the development of smart education.

(6) **Mr Mohamed Ould Amar**, Director-General of the Arab League Educational, Cultural, and Scientific Organization (ALECSO), recognized the tremendous potential of technology in driving educational transformation. ALECSO is currently promoting AI-related projects in member countries, including hosting coding weeks, verifying the credibility of degree certificates using blockchain technology, and launching educational platforms to help the younger generation enter the metaverse world.

These diverse insights from experts and scholars in various fields underscore the era-defining characteristics and technological relevance of smart education. They also highlight how different policy and theoretical frameworks express smart education differently while emphasizing the core principle of deep integration between information technology and education.

Policies are the critical safeguards for advancing educational digital transformation and the development of smart education. **Professor Asha S. Kanwar** concurs with this perspective, emphasizing that the well-designed policy framework for smart education is essential to support and ensure the acceleration of digital transformation through pedagogical innovation. **Ms Harlena Harris**, from the APEC Human Resources Development Working Group, pointed out the challenges involved, highlighting that successful education requires policy design, determination, and capacity building. The transformation of education models should be driven by a technology-empowered mindset and provide suitable "soil" for the sustainability of society and the economy. **Mr Mark Boris Andrijanič**, former Minister of Digital Transformation of Slovenia, proposed five guiding principles for leading digital transformation: leaving no one behind, breaking free from traditional thinking patterns, early positioning, enhancing engagement, and establishing collaborative relationships. **Ms SONG Shanping** believes that the formulation of macro policies should consider educational inclusiveness, ensuring that digital educational resources can reach every learner, and ensuring that every child can equally benefit from the opportunities brought by digital education. **Professor ZHANG Zhiyong** pointed out that deepening comprehensive education reform requires accelerating the reform of the education performance evaluation system and promoting the empowerment of digital education.

Faced with the "major examination" of digitization in the education industry, technological and socio-economic development is driving the transformation and upgrading of the education system. Smart education needs to be integrated into the overall construction of a smart society and a learning society. It should focus on addressing long-standing scientific problems and technological shortcomings. It is crucial to build the "cornerstones" of smart education, which involves nurturing a digital mindset in the education system, strengthening digital support capabilities, creating high-quality digital learning content, and establishing a digital learning public service system for the entire population.

2 Cultivating Top Innovative Talent is the Core Proposition of Smart Education

The essence and mission of education lie in enlightening human wisdom and nurturing outstanding talents. This is the primary task and fundamental goal of smart education. The development of the times and advances in technology drive changes in talent development goals and talent structures, prompting adjustments in educational content, teaching environments, and teaching methods. Smart learning environments impart educational wisdom, innovative teaching models inspire students' intelligence, and modern educational systems nurture human wisdom.

2.1 Smart Education Nurtures Students' Digital Competence

Concerning future learners, international experts emphasize lifelong learning opportunities and students' digital competence. **Mr Mark Boris Andrijanič** emphasizes that the younger generation must master the latest technology while possessing social responsibility, evolving from digital natives into digital leaders. **Mr Andreas Schleicher**, Director for Directorate of Education and Skill in OECD, advocates learning in the digital world. **Mr Raúl Valdés-Cotera**, Project Coordinator at the UNESCO Institute for Lifelong Learning, points out that many universities and higher education institutions have been strategically using online learning tools to provide learning opportunities to a broader range of learners, particularly marginalized and disadvantaged groups. He underscores the crucial role of digital technology in expanding diverse access to education. **Dr. Martín Benavides**, Director of the UNESCO International Institute for Educational Planning, states that effectively addressing persistent educational challenges requires integrating technology into broader national strategies, enhancing the planning and management capabilities of education systems, and fostering digital competence among students, educators, and all stakeholders in the education system to enable them to interact with technology successfully and responsibly.

Regarding future learning methods, Nobel laureate **Professor MO Yan** points out that lifelong learning becomes exceptionally important in the age of intelligence. To stay in sync with the times and avoid becoming obsolete, individuals must continually keep pace with new developments and learn new things. Nobel laureate **Mr Muhammad Yunus** emphasizes that students should not only acquire specific skills but also learn how to learn. The purpose of education is to facilitate personal growth, inspire people to pursue goals, and integrate such a spirit into the daily lives of learners.

The central proposition of smart education is how to help learners learn, better prepare them to face future uncertainties, and innovate the paradigm of talent development. Several academicians propose innovative paradigms for talent development within smart education to cultivate intelligent individuals. **Academician ZHAO Qinpeng** states that the intelligence era imposes new requirements on the caliber and quality of talents, emphasizing the development of students' innovative consciousness, practical skills, and digital literacy, necessitating open, collaborative, and shared educational models. **Academician LV Jian** proposes an organic integration and unity of the paths of nurturing individuals, universities, and the era. He shares the practice of Nanjing University in providing core support for high-quality talent development through high-level disciplines, enhancing the ecosystem of discipline systems, and creating a problem-oriented integrated model system. **Academician ZHANG Jun** introduces the "iSPACE+X Green Education Comprehensive System" established by the Beijing Institute of Technology, focusing on innovation in ideological values, training models, and top-level design of professional systems. **Academician CHEN Xiaohong** points out that the era of data intelligence requires five major transformations in higher education talent development: transitioning from a traditional mindset to a data-driven mindset, shifting from disciplinary specialization to interdisciplinary cross-collaboration, moving from theoretical research dominance to innovation practice dominance, changing from traditional evaluation standards to comprehensive evaluation standards, and transitioning to the deep integration of science and humanities arts. Hunan University of Technology and Business adheres to the fusion development of "New Engineering + New Business + New Liberal Arts," promoting innovation in teaching spaces, teaching models, teaching resources, and teaching evaluations, and nurturing innovative, entrepreneurial, application-oriented, and composite high-level talents.

The widespread application of artificial intelligence in social life will replace a large number of manual jobs, resulting in new structural unemployment issues. Workers must enhance themselves to adapt to changing times. Vocational education and skills training will accompany workers throughout their careers, and the concept of lifelong learning will gradually become deeply ingrained. Therefore, the transformation of vocational education is imminent, and digital technology should be comprehensively applied in the field of vocational education. **Professor SUN Shanxue** suggests building a new digital ecosystem for vocational colleges, clarifying the digital literacy and digital skills of vocational college teachers to promote high-quality development of vocational education. **Professor ZENG Tianshan** advocates the "Three Educational Reforms" (teacher, textbook, and teaching method) that empower vocational education with digitization, emphasizing that vocational education most requires digital technology support, creating vocational education simulation and deep learning scenarios, enhancing teachers' modern literacy, and creating new forms of teaching materials. **Professor WANG Libing**, Director a.i., Chief of Section for Educational Innovation and Skills Development (EISD), UNESCO Multisectoral Regional Office in Bangkok, emphasizes that Technical and Vocational Education and Training (TVET) should promote students' overall development, empower stakeholders on the demand side, establish connections with industries, and drive future job creation. **Ms YI Fan** from the Department of Vocational and Adult Education of the Ministry of Education states that the strategic action for the digitization of vocational education is an inevitable choice for social development. Digital transformation is reflected in three aspects: school models, evaluation models, and governance models. The TVET Leadership and Management Benchmarking Programme conducted discussions and exchanges on how to use digital technology and innovative methods to construct a more effective and flexible TVET system.

How to nurture students who are eager to learn, enjoy learning, and engage in intelligent learning, thereby producing a large number of innovative talents who meet the demands of society and lead the way in shaping the development of the era, is a focal topic of concern for the general public. **Mr Raúl Valdés-Cotera** points out that technology-enhanced learning should consider providing appropriate teaching methods and instructional designs for various learner groups, taking into account the differing levels of digital skills among these learners, thus contributing to the goal of lifelong learning. Learners must develop the skills required to thrive in a rapidly changing society and be able to quickly adapt to new technology-enhanced learning modes. **Mr MA Tao** believes that technology will bring about upgrades in teaching resources, structural reorganization, and expansion of time and space, thereby reshaping the system of teaching and learning. **Mr ZHANG Quan** from the Department of Basic Education of the Ministry of Education and **Professor CAI Chun** from Capital Normal University introduced the achievements of the "New Teaching and Learning Model Based on Educational Reform and Integrated Information Technology" experimental zone, laying a solid foundation for the implementation of educational digitization in the field of curriculum and teaching. Regions and schools from Chongqing, Dalian, Qinghai, Guangdong, and other places shared their explorations in the field of new teaching and learning models.

As the subjects of learning, students should actively participate in the design of future education. **Mr SONG Weizu** calls for exploring the form, direction, and needs of future education from the perspective of design thinking. During the student forum, student representatives from 13 countries shared their experiences and exchanged viewpoints based on the actual situations in their respective countries and their own experiences. The "The 6th Global Competition on Design for Future Education" attracted teachers and students from more than 30 countries and regions, focusing on topics such as inclusive education, teachers' digital skills, learning environment design, and digital transformation of learning. Together, they discussed and designed innovative solutions for the future of education, showcasing their digital learning capabilities.

2.2 Fostering Digital Thinking Among Teachers in Smart Education

The core of smart education development lies in pedagogical transformation, and the enhancement of teachers' digital literacy and skills is pivotal in educational reform. According to UNESCO’s *2023 Global Education Monitoring Report*, the application of digital technology has brought about numerous changes in education and learning, necessitating a continuous improvement in ICT competencies among 21st-century educators. **Professor ZHAN Tao**, Director of UNESCO IITE, emphasizes the significant role that teachers play in the sustainable development of smart education. The emergence of new technologies presents both opportunities and substantial challenges for educators. Ensuring that teaching remains enjoyable is crucial for education professionals, technology providers, and various stakeholders. **Dr. Quentin Wodon**, Director of UNESCO IICBA, highlights that a considerable number of children in Africa are still affected by learning poverty. To address this issue, teachers must play a pivotal role, and measures should be taken to make their professional development more practical, encompassing technological and digital literacy.

In response to the questions of why enhancing teachers' digital literacy is important, what the key factors are, and how to improve it, **Professor FENG Xiaoying** presents six new practical approaches for cultivating teachers' digital literacy in the digital age: new perspectives, new concepts, new models, new mechanisms, new platforms, and new rules. **Mr Borut Čampelj**, researcher of the Department of Education Development and Quality of the Ministry of Education of Slovenia, envisions future smart teachers collaborating more extensively with educational managers, domain experts, and business professionals. He believes that teachers will establish broader connections among themselves to improve teaching methods. **Professor Gyöngyvér Molnár**, Head of the Institute of Education at the University of Szeged in Hungary, underscores the significant impact of the deep integration of new technologies, such as artificial intelligence, with educational instruction on enhancing educational diagnostic assessment and teachers' digital competencies. **Professor Chee-Kit Looi** from The Education University of Hong Kong asserts that the digital transformation of education has brought about innovations in teaching and learning under technology-assisted models. Improving teachers' readiness and their competence in artificial intelligence is critical in this context.

In practice, **Dr. REN Youqun**, Director of the Department of Teacher Education of the Ministry of Education of P.R.China, introduces that through initiatives like the Information Technology Application Capability Enhancement Project for primary and secondary school teachers, are progressively fostering teachers' competence in the digital era. They are also experimenting with artificial intelligence to support teacher workforce development and promoting teacher professional growth through the National Smart Education Platform. These endeavors are driven by the opportunity for digital transformation, and they are complemented by upgraded teacher training philosophies.

Local regions have embarked on diverse practical explorations. For instance, **Mr CUI Tinghui**, Deputy Director of Qinghai Provincial Department of Education, shares the efforts in using the National Smart Education Platform to empower teachers to engage in educational activities, research, and training, thus enabling comprehensive development for learners. In Ziyun County, Guizhou Province, the implementation of the "Five Clouds" (cloud tracking, cloud communication, cloud interaction, cloud assessment, and cloud monitoring) is addressing four challenges faced by teachers (lack of emotions, trust, legality, and action) through intelligent technology, thus supporting rural teacher development.

The construction of high-quality teaching staff for the smart education era relies on teacher training colleges. These institutions naturally bridge the gap between primary education and higher education, playing a pivotal role in enhancing individuals' digital literacy, deepening educational digitization reform, and advancing the goal of becoming a strong education nation. In recent years, Beijing Normal University has been actively implementing a strategic demonstration project for educational digitization, along with the "Internet + Education" reform and innovation action plan. They have also vigorously executed the "Strengthening Teachers" project to propel the results of shared digital development for all. **President MA Jun** suggests strengthening information sharing and resource sharing among teacher training colleges. Through complementary advantages, these institutions can collectively improve the ecosystem of teacher education and promote high-quality and equitable education.

2.3 Technological Support for Comprehensive Quality Assessment Reform

Digitalization has become a significant breakthrough in driving reforms in comprehensive quality assessment for students, offering new avenues to address the challenges associated with such evaluations. **Ms SHU Hua,** Deputy Director of the Department of Science, Technology, and Informatization at the Ministry of Education, emphasizes the need to fully leverage information technology to enhance the scientific, professional, and objective aspects of educational assessment. This involves innovative assessment tools to support comprehensive, process-oriented, and multifaceted evaluations. **Professor MO Jingqi** proposes a top-level design concept for technology-enabled integration of teaching and assessment. This approach, integrating teaching and assessment through modern information technology, drives changes in assessment subjects, content, methods, and outcomes. **Professor CHEN Li** shares the achievements of the "Large-Scale Student Cross-Stage Growth Tracking Research" project team in innovating theoretical models for comprehensive quality assessment, breaking through key technologies in data collection, aggregation, intelligent processing, and analysis, and developing intelligent performance assessment tools and platforms for student comprehensive assessment and development. She calls on educators to fully utilize the advantages of information technology in empowering educational assessment, thereby addressing the current challenges related to inadequate capabilities in comprehensive quality assessment. **Professor XIN Tao** introduces the "Comprehensive Literacy Theoretical Framework," which provides essential support for digitizing and automating comprehensive student development assessments.

Collaborating on the development of regional characteristic assessment tools using digital education data is a future practice direction endorsed by **Professor ZHENG Qinhua**. Several regions, including Chongqing, Changsha, Yangquan, Beijing's Fangshan District, and Foshan, have explored numerous practical cases in this regard. Changsha, for example, has integrated new-generation information technologies such as big data and artificial intelligence into comprehensive quality assessments of ordinary middle schools. They have refined the assessment indicator system, developed assessment analysis models, and strengthened the application of assessment results, thus overcoming bottlenecks in implementing comprehensive assessments, complex value-added assessments, and the application of assessment results. Rui'an's Tangxia Experimental Primary School has established a "Colorful Sunshine Comprehensive Assessment System" based on the "RUI Brain" digital education platform. This system incorporates differentiated, intelligent, and visual assessments, encompassing both process-oriented and summative data assessments, to promote children's comprehensive development and individual growth.

3. The Integration of Technology and Education Powers Innovative Development in Smart Education

Education is the cornerstone of human civilization, while technology serves as the beacon lighting the way to the future. These two domains, education and technology, are actively interpenetrating. Education holds a fundamental, pioneering, and comprehensive position and role, empowering, storing, and enhancing national competitiveness. It serves as a practical field for technology and innovation, with technology's innovative driving force aiding students' adaptive growth, supporting teachers' professional development, and facilitating intelligent upgrades in learning environments. The growing demand for quality education is becoming an inherent driving force behind technological development.

3.1 Bilateral Empowerment of Technology and Education

Digital transformation is an unstoppable trend, representing a profound self-revolution. **Professor ZHOU Aoying** points out that developing educational technology is the fundamental path to achieving digital transformation in education. It involves harnessing the power of data and technology to drive digital transformation, ultimately realizing the vision of smart education. **Professor LI Yanyan** believes that multi-modal perception with cloud-edge synergy will enhance the monitoring of multidimensional learning states, and the complete analysis of the learning process will facilitate precise teaching decisions. Cross-domain integration will support multi-granularity learner profiling, and human-machine collaboration will empower adaptive learning support and services. **Professor HU Xiaoyong** observes that artificial intelligence is ushering in a new era in various aspects of education, including student learning, teacher development, school construction, parent-school collaboration, educational governance, assessment, and promoting educational equity.

The rise of ChatGPT has brought large AI models into the public eye. According to **Professor LIU Ting**, ChatGPT represents an emergence of intelligence and has achieved significant breakthroughs in various areas, such as online memory of vast information, conversational understanding of arbitrary tasks, complex logical reasoning, text generation, and real-time learning and evolution. The penetration and widespread application of generative AI in education will have a significant impact on teaching methods, learning styles, and assessment methods. **Professor WU Fati** believes that the application of generative AI and large models will enhance personalized learning experiences, create adaptive learning environments, stimulate creative inspiration, support human-machine collaborative teaching, and create high-quality educational resources. **Professor HUANG Hua** analyzes the significant impact of generative AI on education through examples such as lesson plan generation, automated homework grading, intelligent question answering, search functions, and more.

Generative AI has led to new ideas and approaches in various fields. **Professor John Rust** from the University of Cambridge discusses the impact of AI on psychometrics. **Professor Jinyan FAN** from Auburn University explains how personalized data generated by AI chatbots can optimize individual assessments in scenarios like recruitment interviews. **Associate Professor Yeun Joon Kim** from the University of Cambridge points out that the correct use of ChatGPT will unleash significant innovation in human-machine collaboration. **Professor LUO Fang** shares insights into automated grading attempts based on large models. Attendees, including experts and students, experienced interactions with four different AI models. **Professor JIAO Jianli** raises ten challenges that generative AI faces in education, while elementary and middle school students pose intriguing questions such as "What role will AI play in the future?" and "Will AI replace my teacher?"

In terms of technology-empowered educational application solutions, **Mr YANG Fei**, Deputy Director of the Center for Educational Technology and Resource Development of the Ministry of Education, introduces the application of the national K-12 smart education platform from the perspectives of resources, functions, scenarios, ecosystems, and data. Longhua District in Shenzhen has released a district-level plan for AI teaching, gradually forming a "dual-core, multi-core" AI education pattern and constructing an AI education model characterized by "1+4+N." This involves innovative curriculum development, the development of educational resources, platform enhancement, teacher team development, encouragement of youth innovation, and deepening the training of well-rounded students, continuously improving and optimizing the effectiveness of AI education. NetDragon has published the "Edmodo Academy (EDA) White Paper." EDA is an educational co-creation platform and a diverse incentive system that allows teachers and students to access educational resources anytime and anywhere, remix course materials, and participate in the co-creation and sharing of the global digital education ecosystem. **Professor LIU Dejian** explains that NetDragon is building an idealized education innovation model and serving a diverse global learner population through technology empowerment. The Smart Education Exhibition showcases the technological strength of enterprises in the process of digitizing education. To realize technology-empowered smart education, it is essential to build a digital foundation. The network serves as the infrastructure of the digital campus and is a necessary support for smart teaching environments. **Mr LI Ying**, Secretary-General of the China Educational Equipment Industry Association, calls for accelerating the standardization of educational equipment to provide strategic resources for educational innovation, bridging the gap between innovation achievements and industrialization, and promoting standardized application. **Representatives from Huawei** advocate for jointly building a secure and trustworthy digital foundation for smart education. **Representatives from the National Engineering Research Centre of Cyberlearning and Intelligent Technology** presented three research achievements: first, the collection of "Design Specification for the Digital Campus Network of Primary and Secondary Schools," aimed at planning the network environment construction of digital campuses, providing secure, stable, and efficient network support for schools; second, the "OpenHarmony Smart Education Equipment Applicaiton White Paper," which is based on the OpenHarmony operating system, supports various educational terminal devices and IoT devices, connecting people, devices, and scenarios; third, the "Construction Scheme for the New Generation Intelligent and Connected Classroom," which is based on cloud-edge synergy technology architecture and targets typical scenarios such as teaching research, inquiry-based learning, and field investigations.

Looking ahead, **Professor YU Shengquan** believes that intelligent education services are the key to the continued development of smart education. Shifting from focusing on platform and resource development to emphasizing service construction, an open-service ecosystem integrating cloud and network should be established. **Academician ZHAO Qinping** points out that the connection targets of the virtual-real fusion "pan-Internet" will expand to include digital twins of physical objects, human avatars, and digital-native objects. This will open up new possibilities for humans to share their existence in both the physical and digital worlds, facilitating easier, more immersive, and more effective learning for learners.

3.2 Prudent Consideration of the Integration of Technology and Education

How can digital technology empower educational transformation? According to **Dr. Martín Benavides**, responsible technology use is crucial to ensure its successful application. **Mr Richard Culatta** from ISTE advocates for fostering a human-technology relationship that is "inclusive, informed, positive, balanced, and agile," collaboratively creating a new educational paradigm that aligns with the needs of the times. Teaching young people the principles and practical skills of AI to help them find solutions to problems using AI is important. It is also essential to nurture human abilities that distinguish us from AI, such as empathy and compassion. **Professor John Shawe-Taylor**, Director of the The International Research Centre on Artificial Intelligence under UNESCO, emphasizes the importance of putting people at the center and promoting the integration of artificial intelligence and education.

Professor Neil Selwyn from Monash University in Australia suggests that we should approach the impact of AI on education rationally and cautiously. Exaggeration and complete prohibition are both undesirable approaches. Instead, the focus should be on addressing societal criticisms and concerns regarding AI's application in education. **Mr Mahmoud Zouaoui** points out that we must fully recognize the risks associated with privacy protection, information security, and internet misuse in the digital transformation of education. Strengthening infrastructure and multi-stakeholder collaboration are necessary to ensure fairness and security in education and enhance students' learning experiences.

Professor Kriengsak Chareonwongsak, Chairman of the Nation-Building Institute International in Thailand, recommends the development of digital education for all, ensuring that everyone possesses basic knowledge of digital tools. Special strategies should be formulated to cultivate more experts while considering ethics and establishing ethical standards for navigating the digital world. As **Mr Shahbaz Khan**, Director of the UNESCO Office in China, notes, the complex application of technology in education requires comprehensive evaluation. AI must prioritize serving and enhancing human capabilities, adhere to ethical principles, avoid discrimination, and follow ethical guidelines such as fairness, transparency, and explainability.

With prudent consideration, the role of technology in the development of smart education is not yet clearly defined. The application scenarios for intelligent educational equipment, system platforms, and tool software are still unclear. Research, practice, and collaboration among technology stakeholders are insufficient, and there is a superficial trend of using intelligent technology in education simply for the sake of using it. To further optimize the technology platform and project layout, it is necessary to initiate the educational digital technology engine that supports the development of smart education.

4 Data Governance as a Deliberate Approach to Systematic Educational Transformation

4.1 Data: A Novel Component in Educational Digitalization

Data plays a fundamental role in the processes of digitization, networking, and intelligence. Adopting the fundamental perspective of "speaking with data, making decisions with data, managing with data, and living with data" is the cornerstone of educational digitization transformation. It enables the empowerment of teaching and learning, management and governance, assessment and research, ultimately facilitating student growth, precise decision-making, and smart education. According to **Mr LEI Chaozi**, Director of the Department of Science, Technology, and Informatization at the Ministry of Education, four key areas are driving the unlocking of digital technology's potential in educational reform and innovation: the establishment of a national education digital big data centre, enhancing the use of big data in education, improving digital literacy and skills among teachers and students, and emphasizing data security and privacy protection. **Professor CHEN Guangju** believes that as the digitalization of education coincides with the rapid development of artificial intelligence technology, data becomes a core element. An increasing amount of learning occurs in the online environment, emphasizing the importance of obtaining real data, scientifically designing underlying algorithms, efficiently utilizing computing networks, and implementing diverse and effective governance. According to **Professor ZHOU Aoying**, digitalization encompasses data and data intelligence, embodying the thinking of the internet and data. It is crucial to fully recognize the importance of data and utilize it to empower educational transformation.

At the level of data application, Turkmenistan has implemented a high-quality decision-making process. This is achieved by creating a new generation of educational management information systems based on an electronic reporting system utilizing a unified statistical table. The system enhances the educational process, develops teacher potential, and establishes individualized learning trajectories for each student. This enables wise, data-driven decisions by local authorities and institutions regarding data-driven education.

In various regions of China, investments have been made in data centre construction and standardized data governance, leading to increased regional management efficiency and teaching effectiveness. For instance, Chenghua District in Chengdu focuses on data-supported initiatives in education, research, management, assessment, and evaluation. It continually promotes the optimization and innovation of management applications. Suzhou City facilitates contactless, one-stop enrollment and approval for schools and parents through cross-level, cross-department mutual certification and exemption from document retrieval using electronic certificates. Wuhan has constructed a horizontally integrated, vertically aligned educational big data application ecosystem. This involves exploring trustworthy digital identity authentication and data rights management in education.

Educational big data derived from smart education provides an objective basis and a fresh perspective for optimizing educational policies, innovating educational teaching models, and transforming educational measurement and evaluation methods. The shift from "management based on experience" to "intensive governance relying on data analysis" necessitates the creation of an educational data brain. This involves establishing secure and convenient data exchange channels, enhancing educational data perception, interconnection, computation, and processing capabilities. This advancement promotes the orderly flow of educational data, enabling data sharing across regions, hierarchies, and departments. This supports informed decision-making and drives the reengineering of management business processes.

4.2 Data Governance as a New Proposition for Educational Governance

On a global scale, the establishment of mechanisms for standardized data utilization has become increasingly imperative for educational transformation. **Mr LEI Chaozi** points out that they will establish a comprehensive data security governance system over the entire life cycle. This will involve improving the data security classification and grading system, refining data authorization management mechanisms, enhancing data security awareness among users, and advocating for the value concept of "security in development and development in security." **Academician ZHAO Qinping** suggests that educational transformation requires the use of technological means, and data governance is a crucial part of it. **Professor Mammo Muchie**, fellow at the South African Academy of Science, calls for the development of global digital governance rules. This would involve the international community coming together to build a peaceful, secure, open, cooperative, and orderly cyberspace community of shared destiny. He encourages cooperation among countries in the fields of data governance and personal privacy protection.

While we witness the transformative potential of data governance, it also brings forth challenges. Phrases like "governance objectives," "governance entities," "data management," "technology platforms," and "policies and regulations" have become highly prevalent. **Associate Professor TONG Lili** analyzes the new pathways of cognitive development driven by generative artificial intelligence and calls for monitoring based on multidimensional data, focusing on human cognitive patterns and educational norms, covering content, information protection, algorithms, and cognitive assessment. **Researcher LV Mingjie**, in a macro, meso, and micro-level analysis, emphasizes that "top-down" resource allocation should focus on the effectiveness and governance evaluation of the allocation. It should also improve the awareness of educational informatization among teachers, students, and parents, stimulating the enthusiasm and initiative of digital resource utilization. **Professor Diana Laurillard** from University College London points out that in various aspects of active learning and social learning, technology has expanded the scale of teaching resources but also brings challenges such as difficulty in identifying ineffective information. Teachers need to demonstrate subjectivity and initiative. Through collaboration, they can enhance their research capabilities and set new goals for instructional activities, iterating in tandem with new technologies.

The contradiction between the role of data elements and the lag in the data governance system is becoming increasingly prominent. Governments of various countries should re-examine, analyze, and formulate relevant national education policies based on their governance structures and specific circumstances. The "Rethinking and Redesigning National Smart Education Strategy," initiated by the Global Smart Education Network, consistently emphasizes the concept of steering intelligent technology governance towards stability, trustworthiness, sustainability, legality, and ethical compliance. The "China Smart Education Bluebook 2022" proposes "new educational governance," where smart education revolves around data governance as its core and data-intelligent technology as its driver. It seeks to comprehensively promote the modernization of the education governance system and governance capacity by advancing the reengineering of education management and business processes.

5. Digital Transformation as the Practical Foundation for Shaping Regional Smart Education Ecosystems

Regional education plays a pivotal role in the effective implementation of national education strategies and the immediate interests of a vast number of teachers, students, and parents. It's the place where education policies are concretely executed, and educational practices genuinely occur. Topics of interest in this context include the creation of distinctive smart education demonstration zones, the sustainable development mechanisms of regional smart education, and the digital transformation of regional education.

5.1 Construction of Demonstration Zone Leading Digital Transformation of Regional Education

The "Smart Education Demonstration Zone" project initiated by the Ministry of Education represents the practical realization of smart education. It involves innovative explorations and practices tailored to local conditions, resulting in replicable and shareable experiences or paradigms. **Mr REN Changshan**, Division Chief of the Division of Education Informatization and Network Security, Department of Science, Technology and Informatization, Ministry of Education, P.R.China, has published the "2023 Best Practices of Smart Education" and the "2022 Best Practices of Smart Education," highlighting exemplary cases for promotion and influence. **Professor ZHU Zhiting** has reviewed the development achievements of China's smart education over the past decade.

Representatives from "Smart Education Demonstration Zones," such as Haidian District in Beijing, Wenzhou City, Nanchang City, Minhang District in Shanghai, and Wuhan City, have introduced their explorations and experiences in supporting smart education, including environmental, modal, service, and governance reforms. For instance, the Haidian District effectively integrates the essence of education with digital innovation by upgrading digital support environments, creating characteristic smart campuses, encouraging innovative teaching and learning modes, and promoting the radiation and diffusion of high-quality educational resources. Nanchang City uses enrollment data to support school management and optimize governance mechanisms. It also leverages practical data to drive the integration of school and social resources and empowers the transformation of the teaching and assessment system through academic data. Wenzhou City has built an integrated application platform called "Good Learning Wenzhou" and established interdepartmental and interlevel educational cooperation mechanisms, creating a smart education ecosystem. Representatives from educational departments in Bengbu City, Guangzhou City, Wuhou District in Chengdu City, Suzhou City, and others engage in discussions about the opportunities and challenges in promoting deep smart education development.

Representatives from educational departments in Changsha City, Baoshan District and Chongning District in Shanghai, Yichang City, Chongqing City, Fuzhou City, among others, shared their experiences in constructing a digital system to empower high-quality education development. For instance, Baoshan District, guided by the keywords "base, data, and ecology," has paved the way for the "standardization + personalization" digital transformation of education in the entire district. Yichang City seized the strategic opportunity of building a smart city, constructed an "education brain," strengthened the educational central base, improved education governance, innovated educational application scenarios, and continued to promote educational digital transformation.

How can regional characteristics be highlighted in the context of comprehensive advancement? How can the power of technological support be harnessed in the process of "feeling the stones while crossing the river"? How can social awareness be raised during the process of "point-to-face" radiation? How can local platforms and national platforms, each working independently, achieve seamless integration and application? How can the application of intelligent technology in education transition from being "superficial" to achieving "deep integration"? The deep development of smart education lacks ready-made experiences to draw from, and there is no established path to follow. This is pioneering and challenging work. The development process and digital transformation of education informationization in China provide fertile ground for smart education research and practice.

5.2 Smart Rural Development Requires Attention to Rural Education Transformation

Advancing digital education transformation requires addressing the issue of promoting inclusive and equitable education with digital technology and avoiding the formation of a digital divide. How to seize new opportunities, stimulate new dynamics, and promote the balanced development of education between urban and rural areas is a shared mission of educators. **Mr YANG Yinfu**, Secretary-General of the Chinese Society of Education, emphasized that technological empowerment of education and regional economic imbalances should not become limiting factors for children's future development. Efforts should be made to break down barriers and enable students from all regions to engage in intelligent learning with technological support. **Professor GUO Shaoqing** pointed out that rural education faces prominent problems such as a structural shortage of teachers and insufficient teacher competence. Rural schools can leverage various levels of educational platforms to provide rich digital education resources and support small-scale schools in conducting human-computer collaborative teaching through the collaborative application of online resources. Simultaneously, the coverage of the "Three-Classroom" approach should be expanded.

Ms Montserrat Creamer, former Minister of Education in Ecuador, elucidates the ideal vision of education in smart rural areas, which supports personalized learning, individual development, and data-driven education. She notes that a new rural paradigm can be co-constructed through blended learning, teacher training, community and parental involvement, and multi-grade collaborative learning to ensure the sustainable development of rural education. **Mr Raúl Valdés-Cotera** points out that from a global perspective, there are still significant disparities in internet penetration and educational attainment between regions and genders. Technology should be used to help address educational equity issues. He emphasizes that while improving digital skills and awareness, human care should also be highlighted to collectively build a new era of lifelong learning in the digital age. **Professor Worsak Kanok-Nukulchai**, fellow of the Royal Thai Academy of Science, highlights that artificial intelligence is the "new electricity" in the era of intelligence. Its democratization and widespread application can promote equality and equity in ten aspects, including improving educational accessibility and quality, enhancing agriculture, and boosting local businesses, thus narrowing the urban-rural gap. **Ms Habibah Abdul Rahim**, Secretary-General of the Southeast Asian Ministers of Education Organization (SEAMEO), shares two key consensus points reached by Southeast Asian countries in promoting educational digital transformation: advancing policy formulation and cultivating the digital leadership of policymakers, and responding to local needs by encouraging community participation. **Professor Vinayagum Chinapah** from Stockholm University advocates for empowering smart rural development through digital transformation. He emphasizes the importance of conducting digital education for all, with all stakeholders, especially rural participants, playing a significant role.

In the practical domain, **Professor Moeketsi Letseka**, UNESCO Chairholder in Open Distance Learning, introduces how South Africa has changed traditional university learning through open distance learning and smart environments. This has expanded the scale of educational resource dissemination, allowing more people to enjoy higher-quality, lower-cost education, thus promoting educational equity and sustainable development. **Ms MA Li**, Deputy Director of the Department of Education of the Ningxia Hui Autonomous Region, introduced how Ningxia has seized the opportunity of digital transformation, consolidated its digital foundation, and established digital arteries as an "Internet + Education" demonstration zone. It has focused on addressing challenges such as weak digital infrastructure in education, a shortage of high-quality educational resources, the lack of timeliness and targetedness in traditional teaching methods, teachers' weak digital integration capabilities, and the low efficiency of educational services and management. **Mr CUI Changhong**, Deputy Director of the Sichuan Provincial Department of Education, advocates the concept of prioritizing demand, emphasizing effectiveness, and being reform-oriented. This concept aims to resolve the contradiction between high-quality education development and uneven development among regions, urban and rural areas, and schools.

6 International Cooperation is the Common Path towards a Better Future for Human Education

The report "Reimagining Our Futures Together: A New Social Contract for Education" released by UNESCO emphasizes the development of digital technology as a new avenue for humanity but also highlights unprecedented risks. It calls on all countries worldwide to unite and reshape an ideal future society through educational transformation. The inaugural World Digital Education Conference launched the World Digital Education Alliance Initiative and the Global Partnership on Digital Education Development. H.E. Mr HUAI Jinpeng, Minister of Education of P.R.China, pointed out that the digital age has provided us with an efficient platform for open cooperation. Open cooperation has become a key element in driving innovation and reform in education in the new era.

Mr Cosmas Luckyson Zavazava, Director of the Telecommunication Development Bureau of ITU, introduced ITU's actions and initiatives in promoting connectivity, digital transformation in education, and efforts in building smart education partnerships. **Mr Mohamed Ould Amar**, the Director-General of ALECSO stated that ALECSO would engage in broader exchanges and cooperation with international organizations, regional organizations, higher education institutions, and research institutions. This collaboration aims to help learners better survive and thrive in a knowledge-based society. **H.E. Mr CHEN Jie** proposed three initiatives: firstly, strengthening policy dialogue to promote educational reform, exploring the scientific path and effective policies for developing smart education together; secondly, enhancing resource sharing to promote inclusivity and equity, and involving more countries and people in the development of high-quality educational resources, ensuring that smart education benefits everyone; thirdly, reinforcing capacity-building cooperation to jointly promote teaching reform, creating platforms and expanding channels for inter-country teacher exchange, educational research collaboration, and curriculum development.

The Global Smart Education Network (GSENet) initiated the "Rethinking and Redesigning National Smart Education Strategy," which includes three strategic levers: advancing smart education development by transforming teaching methods, creating smart learning environments, and formulating forward-looking policies; policymakers should analyze and formulate national education policies based on infrastructure, resources, curriculum, digital skills, and literacy, constructing a new ecosystem for smart education; all stakeholders should strengthen cooperation, accelerate the development of inclusive, equitable, and high-quality education, and establish a public service system for smart education.

As **Dr. SHAN Zhiguang** rightly put it, considering the vibrant development of educational digital transformation and smart education, this is the best of times. However, when considering the differentiation in global educational philosophies and the confusion in educational paths, it can also be seen as the worst of times. Therefore, it requires the collective participation and close cooperation of all countries, schools, teachers, students, families, businesses, and society as a whole. The Global Smart Education Conference has provided an important platform for international society to engage in smart education exchanges and cooperation. In his address, **H.E. Mr CHEN Jie** proposed that we seize this opportunity to deepen exchanges and cooperation and jointly create a better future for smart education that benefits all of humanity.

**This article draws its primary references from the PowerPoint presentations of guest speakers and conference records at the Global Smart Education Conference 2023.*

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Xi Jinping emphasized during the fifth collective study session of the Political Bureau of the CPC Central Committee "the need to accelerate the construction of a powerful country in education to provide robust support for the great rejuvenation of the Chinese nation". *People's Daily*. Available at: http://paper.people.com.cn/rmrb/html/202305/30/nw.D110000renmrb_20230530_1-01.htm

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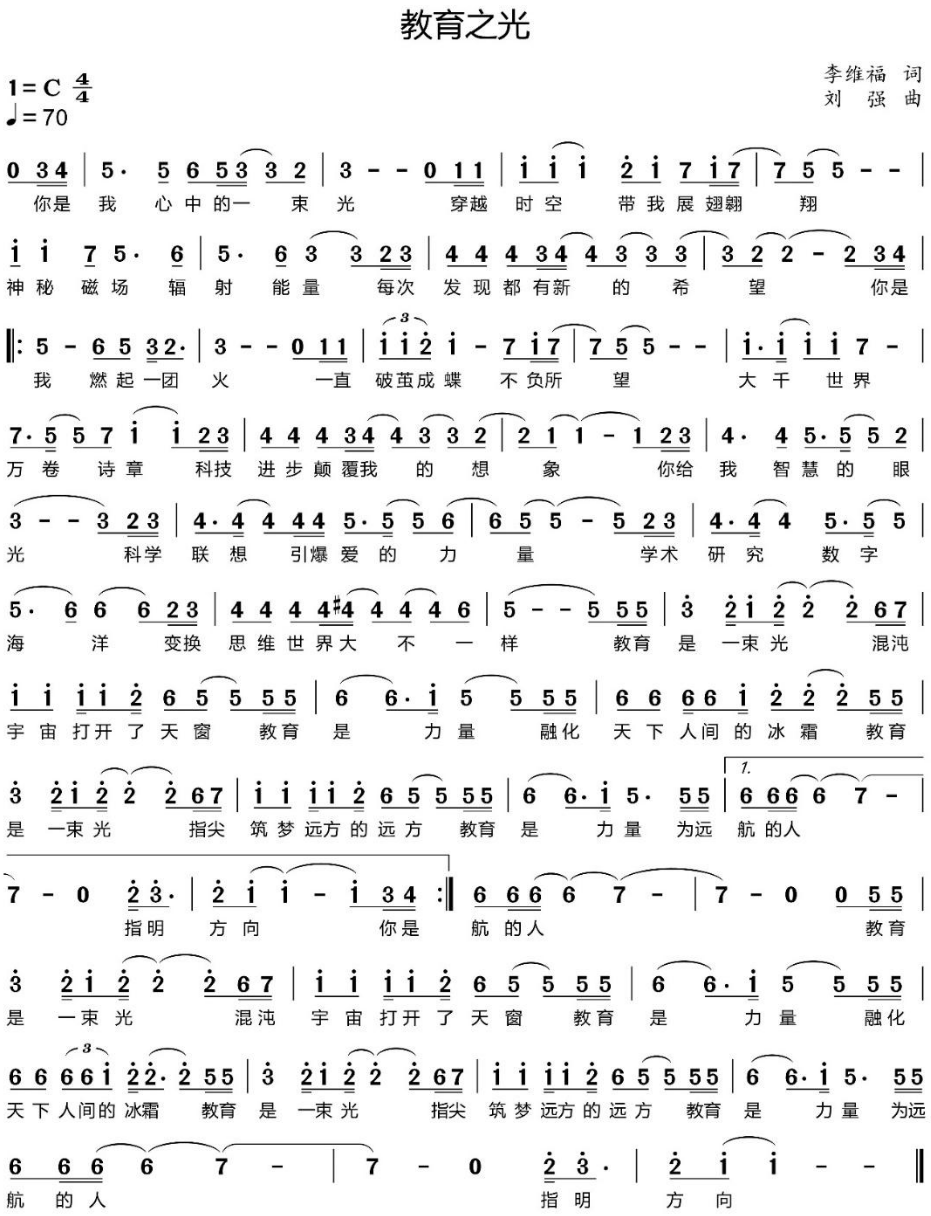
Radiance of Education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刘 强 曲
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你是我心中的一束光 穿越时空 带我展翅翱翔
神秘磁场 辐射能量 每次发现都有新的希望 你是
我燃起一团火 一直破茧成蝶 不负所望 大千世界
万卷诗章 科技进步颠覆我的想象 你给我智慧的眼
光 科学联想 引爆爱的力量 学术研究数字
海洋 变换思维世界大不一样 教育是一束光 混沌
宇宙打开了天窗 教育是力量 融化天下人间的冰霜 教育
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航的人 指明方向

Be in awe of education, for it shapes the soul of human,
Be cautious to technologies, for its adoption has to be effective.
Be entangled with Smart, for the uncertainty tends to be increasing,
Be serious to academies, for the true research needs evidence.

---Ronghuai Huang March 20th, 2017

Radiance of Education

Within my soul, you're a shining light,
Across the skies, with you, I take flight.
Mysterious realm, empowering might,
Each discovery ignites hope in sight.

You ignite in me a passionate fire,
Resolute to grow and aspire.
In this vast world, with hearts so dire,
Technology's progress fuels my desire.

You grant me a discerning gaze,
Science's wonders, love's powerful blaze.
In scholarly seas, where knowledge plays,
Changing the realm of thought's intricate maze.

Education, a luminous ray,
Unveils the cosmos, opening the way.
Education, a potent display,
Melting Earth's frost, come what may.

Education, an illuminating track,
Guiding dreams forward, never looking back.
Education, strength that we lack,
Navigating adventurers on the right track.

Be in awe of education, for it shapes the soul of human,
Be cautious to technologies, for its adoption has to be effective,
Be entangled with Smart, for the uncertainty tends to be increasing,
Be serious to academies, for the true research needs evidence.

Contact

Global Smart Education Network

The founding members of GSENet are Beijing Normal University, the UNESCO Institute for Information Technologies in Education, the Commonwealth of Learning, the International Society for Technology in Education, the Southeast Asian Ministers of Education Organization, and the Arab League Educational, Cultural and Scientific Organization. The Secretariat is the Smart Learning Institute (SLI) of BNU. GSENet aims to connect educational technology organizations for disseminating generic policies and innovative strategies at national, regional, and school levels towards achieving SDG 4 targets, and to promote state-of-art technologies, practical experiences, and best practices to serve researchers, teachers, and technicians in supporting the development of smart education.

Contact

Official Website: http://gse.bnu.edu.cn

E-mail: gse@bnu.edu.cn

WeChat: GlobalSmartEducation

address: 12th Floor, Block A of Jingshi Science and Technology Building, No. 12 Xueyuan South Road,

Haidian District, Beijing

Postcode: 100082

2023
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Synthesis Report

Global Smart Education Conference 2023

Education Transformation and Data Governance

The Global Smart Education Conference 2023, held on August 18-20, explored the theme 'Education Transformation and Data Governance'. This publication is a synthesis of the key discussions, focusing on strategy and promotion path of the digital transformation of education, the mechanism of technology-enabled education, and exploring the construction of a regional smart education ecosystem and learning society. It aims to provide insights on the growth of the digital generation and the innovation of evaluation methods, and share new theories, technologies, ideas and outcomes of smart education.

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