Exploration of Innovation Strategy in the Deep Integration of Information Technology and Education and Teaching

Lingyan Meng*

Facultad de Filosofía y Letras de Universidad de Buenos Aires, Buenos Aires 999071, Argentina

*Corresponding author: Lingyan Meng, menglingyan@filo.uba.ar

Abstract: The rapid development of information technology provides a new opportunity and impetus for the reform of education and teaching. Deep integration of information technology and education and teaching is the only way to promote the modernization of education. Starting from the connotation of the deep integration of information technology and education and teaching, this paper analyzes the existing problems in the current integration process, and puts forward innovative strategies from the aspects of concept, resources, model, and evaluation. Through measures such as building a smart teaching environment, enriching high-quality teaching resources, innovating teaching organization models, and establishing multiple evaluation systems, we will realize the deep integration of information technology and teaching, promote the reform of teaching and learning methods, improve the quality of personnel training, and provide strong support for the modernization of education.

Keywords: Information technology; Education and teaching; Deep integration; Innovation strategy

1. Introduction

Information technology is developing at an unprecedented speed, which has triggered profound changes in all fields of society. As a future-oriented cause, education must actively adapt to the development trend of information technology and promote the reform of education and teaching with information technology. The report of the Party's 20th National Congress pointed out that it is necessary to "speed up the modernization of education and do a good job of education that the people are satisfied with," which pointed out the direction for education reform and development. The 10-Year Development Plan for Education Informatization (2011–2020) of the Ministry of Education clearly states that the deep integration of information technology and education and teaching is the key support for promoting education reform and improving education quality. As the main position of training high-level talents, colleges and universities should actively explore innovative ways of deep integration of information technology and education and teaching, and train innovative talents to meet the needs of the development of information society.

2. Connotation of deep integration of information technology and education and teaching

The deep integration of information technology and education and teaching refers to the process of making full use of modern information technology to optimize the teaching process, innovate the teaching mode, and improve the teaching efficiency and quality in all aspects of the education concept, teaching content, teaching method, and teaching evaluation. This integration is not simply the application of technology, but the process of profoundly reshaping teaching and learning through technological means [1].

2.1. Integration of ideas

Educators should establish the concept of lifelong learning and innovative development, learn to master and use information technology, and actively adapt to the needs of information development. It is necessary to break through the traditional "teacher-centered" concept, build a new teaching ecology of "student-centered," stimulate students' learning interest and initiative, and cultivate students' independent learning ability and innovation ability.

2.2. Integration of resources

Information technology provides a variety of possibilities for the presentation of teaching content, and teaching resources extend from a single textbook to a broad network space. The application of new technologies such as big data, virtual reality, and artificial intelligence has made teaching resources more diverse and vivid. The rise of online courses such as MOOCs (massive open online courses) and micro-courses has broken the time and space restrictions of campuses, and students can share high-quality educational resources. Teachers should actively develop and utilize information-based teaching resources, create real situations, and stimulate learning interest.

2.3. Integration of processes

The application of information technology changes the role of classroom teachers from "knowledge imparts" to "learning guides," and students from "passive receivers" to "active inquirers." The new teaching mode represented by project-based learning and problem-based learning emphasizes the principal position of students and the cultivation of ability. New technologies such as mobile Internet and virtual reality have expanded learning time and space, and new teaching organization methods such as online and offline mixed teaching and ubiquitous learning have emerged, reshaping the process of teaching and learning [2].

2.4. Integration of evaluation

Information technology helps the reform of teaching evaluation and provides the possibility of combining process evaluation with result evaluation. With the help of big data analysis, intelligent assessment, and other technologies, students' learning processes and effects can be recorded to achieve personalized evaluation and accurate feedback [3]. The application of microteaching, electronic portfolios, and other tools has expanded teachers' teaching evaluation and students' learning vision. The wide application of formative assessment contributes to the continuous improvement of teaching and learning quality.

3. Problems faced by the deep integration of information technology and education and teaching

3.1. Insufficient depth of integration

At present, the application of information technology in many colleges and universities still stays in the shallow

level integration stage such as courseware making and multimedia teaching, and the combination of technology and teaching is superficial, failing to deeply affect the core elements such as teaching content, teaching organization, and teaching evaluation. The use of information technology by teachers and students mainly focuses on teaching assistance and classroom presentation, and the integration of teaching design, teaching management, and teaching service is insufficient, which fails to optimize the teaching process as a whole and promote the teaching reform.

3.2. Deficient supply of high-quality resources

Compared with the requirements of the rapid development of information technology, the construction of digital teaching resources in colleges and universities is still relatively backward. In some schools, the information transformation of teaching resources is deficient, the presentation of resources is single, and the interaction is poor. The total amount of high-quality online courses and virtual simulation experiments is limited, and the sharing degree is low, which makes it difficult to meet the needs of students' personalized learning [4]. The pertinence and practicability of resources need to be strengthened, and it is difficult to support teaching innovation effectively.

3.3. Inadequate teachers' information literacy

Teachers are the key force for the deep integration of information technology with education and teaching, but many teachers still need to strengthen their understanding and application of information technology. Influenced by traditional teaching concepts, some teachers are cautious or even resistant to information technology and lack the awareness of active use. Although some teachers have certain information teaching skills, they lack the experience of deep integration of technology and teaching, and cannot flexibly use technology to optimize teaching.

3.4. Imperfect system guarantee of integration

Universities lack top-level design and systematic planning in promoting the integration of information technology and education and teaching, and the construction of relevant systems is lagging. In the aspects of teaching management, performance appraisal, teacher development, etc., there is a lack of incentive and restraint mechanisms to promote integration and encourage innovation. The lack of clear policy guidance and normative guidance for new teaching modes such as online teaching and blended teaching has affected the participation enthusiasm of teachers and students to a certain extent [5].

4. Innovative strategies for deepening the integration of information technology and education and teaching

4.1. Updating the educational concept and creating an atmosphere of integration and innovation

The deep integration of information technology and education and teaching should first start with idea renewal. Colleges and universities should firmly establish the "student-centered" education concept, respect students' personality differences and development needs, and create an open and interactive intelligent teaching environment. We should encourage teachers to establish the concept of lifelong learning, actively learn information technology knowledge, improve the ability to use it, and integrate information technology innovation into the whole teaching process. It is necessary to strengthen publicity and guidance, popularize the concept of information-based teaching, and improve the initiative and creativity of teachers and students to use information technology to promote teaching reform [6]. We need to establish a sound teaching incentive

mechanism, give policy, funding, and other support to teaching innovation, and mobilize teachers' enthusiasm for in-depth application of information technology. Additionally, we should build a platform for teachers' teaching discussion and experience sharing, and promote the promotion and application of excellent cases.

4.2. Enriching high-quality resources and building an intelligent learning environment

We should give full play to the advantages of information technology and strengthen the construction of high-quality digital teaching resources. We need to encourage teachers to actively participate in the research and development of online open courses, virtual simulation experiments, and other resources to improve the quality and richness of resources. We should also establish a mechanism for resource co-construction and sharing, promote the exchange and application of high-quality resources, and strengthen the contextualization and adaptive design of resources to improve the pertinence and practicability of resources. New technologies such as big data and artificial intelligence are used to achieve intelligent resource push and personalized services [7]. New teaching spaces such as smart classrooms and innovation labs will be built to create immersive and interactive learning experiences. A ubiquitous learning support environment can provide teachers and students with convenient access to resources and services anytime, anywhere, and on demand.

4.3. Innovating the teaching mode and improving the quality of learning experience

The use of information technology to promote the innovation of teaching mode is a key measure of deep integration. It is necessary to optimize the teaching design with students as the center, comprehensively use online learning, mobile learning, virtual reality, and other technical means, and build a hybrid teaching model that combines online and offline. We should have reasonable design of flipped classrooms, project-based learning, and other new teaching organization forms, fully mobilize students' learning initiative and participation, and provide individualized learning support and guidance for different students [8]. A sound online learning management and support service system is established to track learning situations in time and improve teaching. Innovative ways of teaching interaction, including brainstorming, group discussion, role-playing, and other diverse activities, strengthen the communication between teachers and students and enhance the fun and effectiveness of the learning experience.

4.4. Establishing multiple evaluations and optimizing the quality of talent training

It is necessary to deepen the integration of information technology and education and teaching evaluation and establish a diversified teaching quality evaluation and monitoring system. Big data, learning analysis, and other technologies are used to dynamically collect students' learning process data, master the characteristics and rules of learning behavior, and implement precision teaching intervention and quality diagnosis. We should improve the multiple evaluation system, which combines the process evaluation and the result evaluation, and guide the students to pay attention to the improvement of their skills. Students are encouraged to record their personal development through learning portfolios, development records, and other ways to achieve self-management and evaluation [9]. Teaching evaluation feedback and improvement mechanisms are established and teaching reform measures are continuously optimized according to problems. The effectiveness of teachers' use of information technology to promote teaching innovation should be included in the performance appraisal system, and teachers should be guided to concentrate on teaching and educating people [10].

4.5. Strengthening training and empowerment to improve teachers' and students' information literacy

We should formulate a systematic information literacy training and improvement plan for teachers and students,

and carry out demand-oriented classified and hierarchical training. It is imperative to focus on the actual teaching needs of teachers and improve their technology application and teaching design ability; develop training courses deeply integrated with subject teaching to enhance the effectiveness of training; promote teachers to strengthen cooperation and exchange, integrate superior resources, and jointly improve the ability to use information technology to innovate teaching [11]. We also need to strengthen the education of teachers' ethics and style, guide teachers to enhance their awareness of education, and improve their teaching ability. The elective course for information literacy promotion is set up for students, and it is included in the talent training program to improve students' ability to use information technology. The application ability of information technology should be taken as an important indicator of teacher admission, assessment, and promotion to stimulate teachers' enthusiasm for learning [12].

4.6. Improving the system construction and strengthening the long-term mechanism of integration

In order to realize the deep integration of information technology and education and teaching, it is necessary to carry out top-level design from the macro level and establish a clear medium and long-term plan and roadmap. This requires the joint participation of the government, education departments, and academic institutions to clarify goals and tasks, highlight key areas, and formulate specific promotion measures [13]. For example, special funds can be set up to support innovative projects, encourage school-enterprise cooperation, and promote the research and development and application of educational technology. At the same time, it is essential to establish and improve relevant supporting systems. This involves the adjustment of personnel training policies, such as attracting and training more versatile talents who know technology and can teach; the optimization of funding investment mechanism to ensure that there are sufficient funds to support technology updating and teaching reform; and the innovation of teaching management and performance appraisal system to encourage teachers to actively participate in information-based teaching. For online teaching and smart classroom construction, clear management methods and normative standards should be formulated to ensure that these new teaching modes can be carried out in an orderly and standardized environment [14]. This not only helps to improve the quality of teaching but also helps to protect students' learning rights and interests. In addition, improving the teacher incentive mechanism is the key. Integrating information-based teaching performance into the evaluation system of teacher title evaluation and job promotion can effectively mobilize the enthusiasm of teachers, encourage them to constantly learn and master new technologies, and improve teaching methods [15]. Finally, strengthening teaching process supervision and quality assessment is an important measure to ensure the effectiveness of integration. The establishment of a regular supervision, inspection, and evaluation feedback mechanism can not only detect and solve problems in time but also continue to promote the deepening of education integration and ensure the effectiveness of education information construction, and the results are widely applied and promoted [16]. Through these measures, we can gradually build a long-term mechanism to promote the deep integration of information technology and education and teaching and provide a solid institutional guarantee for the modernization of education.

4.7. Strengthening collaborative innovation and promoting the integrated development of industry and education

Faced with the rapid iteration and update of information technology and the emergence of various new technologies and products, colleges and universities should actively promote collaborative innovation, promote the integrated development of production and education, and drive the deep integration of information technology and professional education through the integration of production and education [17]. First of all, colleges and universities should consciously strengthen their cooperation with information technology

enterprises and establish a close cooperation mechanism of production, study, and research. Enterprise experts are introduced to participate in teaching design and course construction, so that students can get in touch with cutting-edge technologies and understand the industry development dynamics [18]. Secondly, colleges and universities should encourage professional teachers to take temporary positions in enterprises to improve their practical teaching skills; establish and improve the management system of teacher-to-enterprise practice, and incorporate it into the teacher training and assessment system. In addition, colleges and universities should also provide students with good practical training opportunities, support students to participate in the real project development of enterprises through training bases, enterprise internships, and other ways, and strengthen innovation and entrepreneurship ability in practice. Finally, we need to actively build a platform for connecting production and education to promote the two-way flow of talents, projects, and resources [19]. Focusing on the needs of regional economic and social development, we will actively carry out collaborative research and accelerate the transformation and application of scientific and technological achievements. The integration of industry and education can promote the positive interaction between college education and teaching, technology, and industrial development, and enhance the ability to serve economic and social development [20].

5. Concluding remarks

To sum up, the deep integration of information technology and education and teaching is a complex and long-term systematic project, which needs to be coordinated and systematically promoted from multiple dimensions such as concept, resources, model, evaluation, training, and system. Colleges and universities should base themselves on their own situations, formulate plans scientifically, innovate systems and mechanisms, and actively explore distinctive and differentiated development paths while consolidating the foundation and improving the conditions. It is necessary to strengthen school-enterprise cooperation and inter-school collaboration, gather advantageous resources, and form a strong force to promote integrated development. We must adhere to the problem-oriented and demand-oriented principles, focus on the requirements of talent training, and continue to deepen education and teaching reform. It is believed that through scientific policies and systematic promotion, it will be able to promote the integration of information technology and education and teaching to achieve a higher level and make greater contributions to improving the quality of personnel training and serving economic and social development.

Disclosure statement

The author declares no conflict of interest.

References

[1] Zhang Q, 2019, The Foundation, Goal and Approach of the Integration of Information Technology and Education and Teaching. Cross-Straits Lifelong Education, 27(01): 59–65.

[2] Cao J, Wang L, 2023, Research and Practice of Web-Based Learning Space Assisting Education and Teaching Ecological System Construction. Journal of Luohe Vocational and Technical College, 22(06): 95–98.

[3] Chen X, 2023, Let Information Technology Deeply Integrate with Education and Teaching. Jiangxi Education, 2023(42): 2.

[4] Zhao L, Cui R, Jiang H, et al., 2023, Research on the Deep Integration of Information Technology and Higher Education Teaching. Journal of Anhui Electronic Information Technical College, 22(03): 95–98.

[5] Cui F, 2023, Research on Teaching Management Application of Deep Integration of Information Technology and Education Teaching. Journal of Changji College, 2023(04): 90–95.

[6] Wang W, 2023, Implementation Strategy and Problem Analysis of Integrated Application of Information Technology and Education and Teaching. China Educational Technology and Equipment, 2023(15): 8–10 + 19.

[7] Lin Y, 2023, Deep Integration and Mechanism of Ideological and Political Education and Information Technology. Modern Enterprise, 2023(08): 142–144.

[8] Xiong J, Zhang H, 2023, Integration Strategies of Information Technology and Education and Teaching in the Context of Smart Campus. Science and Technology of RTVU, 2023(02): 31–34.

[9] Xia J, Guo X, 2023, Teaching Practice and Reflection on the Deep Integration of "Internet + Education." High School Mathematics Teaching and Learning, 2023(10): 1–4.

[10] Tian X, 2023, Deep Integration of Information Technology and Education and Teaching. Journal of Science, 2023(16): 92–93.

[11] Yan W, Wang C, Li H, 2023, Give Full Play to the Advantages of Information Technology to Promote the Development of Education and Teaching. China Educational Technology and Equipment, 2023(06): 38–40 + 44.

[12] Song L, Zhang S, 2023, Problems and Countermeasures of Deep Integration of Information Technology and Education and Teaching. Information Technology Education in Primary and Secondary Schools, 2023(Z1): 45–46.

[13] Liao Q, Huang D, 2023, Development of International Teaching Ability of Local College Teachers from the Perspective of Education Informatization. Journal of Beibu Gulf University, 38(01): 61–67.

[14] Research Results of Integration Innovation of Information Technology and Education and Teaching, 2023, China Information Technology Education, 2023(03): 95.

[15] Chen L, 2023, The Teaching Mode of In-Depth Integration of Information Technology and Subject. Arts and Science Navigation (Middle), 2023(01): 31–33.

[16] Zhao C, 2022, Promote the Integration and Innovation of Information Technology and Education and Teaching, Rule of Law Daily, December 27, 2022, (005).

[17] Fan J, Deng S, Wang H, 2022, Discussion on the deep Integration of Innovation and Entrepreneurship Education and Ideological and Political Education in Colleges and Universities. School Party Building and Ideological Education, 2022(23): 85–87.

[18] Zhang Q, 2022, Teaching Innovation in Digital Learning Environment: The Deep Integration of Information Technology and Educational Teaching, Journal of New Curriculum Research. Collection of Research on the New Curriculum Reform Education Theory (25), Baise Senior High School for Nationalities, 2.

[19] Li G, 2022, Exploration on Deep Integration of Information Technology and Education Teaching in Undergraduate Universities. Science and Technology Wind, 2022(24): 103–105.

[20] Zheng L, 2018, In-Depth Integration and Innovation Strategy of Information Technology and Education and Teaching. Journal of Luohe Vocational and Technical College, 17(05): 75–77.