

Digital Transformation of Education in Application-oriented Universities under the Background of Digital China

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Abstract: In the implementation of the digital China strategy, the digital transformation of education is of great significance for application-oriented universities. This study first analyzed the changes in education concepts and methods faced by application-oriented universities in the wave of digital transformation. Next, we analyzed the education innovation opportunities for application-oriented universities induced by the digital transformation, which were manifested by a more reasonable allocation of high-quality education resources, a more suitable university education model for the industry, an improved update of university education concepts, and a gain of the power of discourse in the industry-university-research work. Based on this, the paper discussed the direction and approaches of the digital transformation of education in application-oriented universities and proposed that the digital transformation of education in application-oriented universities should be achieved with the top-level design of the digital transformation of education in universities guided by the digital China strategy, the digital organization structure of universities constructed based on institutional guarantee, the digital innovation and development of teaching and scientific research relying on data management, and empowerment by digital technologies.

1. Introduction

With the rapid development of innovative technologies, such as artificial intelligence (AI), big data, and next-generation Internet, the digital revolution is now underway, contributing to significant changes in social structure and industrial form [1]. A report of Schools of the Future: Defining New Models of Education for the Fourth Industrial Revolution published by the World Economic Forum 2020 delineated approaches for high-quality development of education during the global digital transformation by defining an "Education 4.0 Framework" [2]. China's 13th Five-Year Plan raised the "Digital China" strategy to the national strategic height to drive digital transformation in various

fields of society. After the Ministry of education proposed "Implementing the Digitization Strategy for Education" at the 2022 national educational working conference, clear working plans were generated for digital transformation approaches at universities [3], which required universities to accelerate the realization of demand-based, integration-deepened, innovation-empowered and application-driven digital transformation. The full implementation of educational digitization caused a profound and significant impact on the educational industry. The digital transformation of universities should adhere to the guidelines for the strategy of Digital China [4-5], so as to stick to correct values and master effective methodology. First of all, digitization has its own characteristics and is fundamentally different from informatization. Based on information construction, digital transformation can be achieved through the construction of IT infrastructure and empowerment by digitization [6]. Digital transformation is a strategic transformation based on top-level design, and all stages are closely aligned and mutually promoted during transformation. Secondly, the digital transformation of education in application-oriented universities is not a simple combination of digitization and existing education models but a revolutionary change in the development of universities: next-generation information technologies such as AI and big data are used to profoundly, comprehensively, and systematically reshape the industry [7]. Therefore, it is necessary to innovate approaches for educational digitization at universities by adhering to the guidelines for the digital China strategy as well as strategic theory and guiding policies for the digital transformation of education in application-oriented universities.

2. Challenges and Coping Strategies for Digital Transformation of Education

2.1. Challenges Faced by Application-oriented Universities

The development of digital technologies has induced significant changes in various fields of society. changes in the field of education are mainly manifested by the demands for the rapid improvement of high-quality education and the output of more high-quality talents [8]. Therefore, how to adjust the talent cultivation strategy timely to achieve the strategic objectives is the biggest challenge faced by application-oriented universities in the digital wave [9].

Firstly, the school-running model and operating mechanism of application-oriented universities must be changed to adapt to the industrialization of education services and the resultant reform of the education evaluation mechanism [2]. As emerging educational institutions have provided specialized teaching and practice, the educational superiority of universities has been undermined and their educational monopoly has been gradually broken. In an attempt to gain an advantage in the fierce competition, application-oriented universities need to optimize, improve, reform, and break through the existing running mode. Secondly, given the diversified sources of students as well as personalized and differentiated educational demands in current higher education, application-oriented universities should develop and reform their educational concepts and update them according to the new talent criteria [10]. Meanwhile, the traditional educational concept of "teacher-centered" should be substituted with the new "student-centered" concept to optimize the teaching process and improve the teaching quality. Otherwise, the digital transformation of education is impossible to be achieved only with digital technologies. Additionally, in the digital era, higher education is facing fierce competition in the source of students, and the rapid development of new theories and technologies has induced high requirements for talent cultivation. Hence, more attention should be paid to the actual outcomes of talent cultivation in the evaluation of the quality of education in application-oriented universities [11].

2.2. Opportunities for the Digital Transformation of Education in Application-oriented Universities

The application-oriented universities are confronted with various challenges brought by the rapid advancement of the digital wave, which determines that digital transformation must be the current development strategy of application-oriented universities. Meantime, digital transformation should be guided by the digital China strategy [12], providing an endogenous driving force for the development of universities. Firstly, the top-level design of the digital transformation should be completed under the guidance of the digital China strategy. Effective management of all the data including teaching, administration, and logistics, resource allocation optimization, and structure iteration are followed to realize process optimization in all aspects such as teaching, administration, and logistics. Also, new-generation information technologies are applied to improve the ability of resource allocation and decision-making analysis [13,14], achieving the digitization of university management. Secondly, application-oriented universities should modify their education models and talent training programs in response to the changes in the student source and employment demand. Digital technologies are adopted to trace effective employment demand and establish a dynamic evaluation system for teaching and training [15], so as to improve the quality of talents cultivated by universities and highly meet the social demand for talents.

The solutions generated by new-generation digital technologies can expand the teaching methods and technical services of universities in a new way, thus improving the quality of education. The root of the improvement of education quality is not the digital technology itself but the innovation dividend from digital technology after the improvement of thinking levels such as cognition and concept. The learning demands, goals, and motivations of students in application-oriented universities have different and personalized characteristics. Considering these characteristics, universities should reform the traditional teaching model and implement individualized teaching based on the "student-centered" teaching concept. In addition, it is inevitable to cultivate new technical talents with the assistance of external forces during the digital transformation of application-oriented universities. However, high reliance on external forces will cause a loss of power of discourse in partnership and disrupt the balance of co-construction and sharing. Application-oriented universities can grasp the initiative and voice of talent cultivation only by effectively accomplishing digital transformation and mastering the relevant advantages and resources.

3. Digital Transformation Approaches of Education in Application-oriented Universities

The scientific and technological revolution represented by the new-generation information technologies is underway in all fields of human society, and the field of higher education is also facing historic changes. The application-oriented universities urgently need to use advanced digital technologies to achieve their important roles in tackling key scientific problems and cultivating high-quality application-oriented talents. Therefore, it is urgent to transform and upgrade the supporting mode and solve puzzles and problems using digital thinking and technologies for the digital transformation of application-oriented universities [16]. In this context, the digital transformation approaches of application-oriented universities include the following approaches.

At first, the top-level design of digital transformation of application-oriented universities should be optimized under the guidance of the digital China strategy. In response to a new round of scientific and technological revolution caused by digital technologies, major changes are found in the teaching methods of disciplinary knowledge in universities, the relationship between disciplines, and the collaborative innovation methods of diverse technologies, rendering the top-level strategic design of digital transformation particularly important. The universities should focus on the fundamental task of "morality education" under the guidance of the digital China strategy, implement strategic

positioning according to actual demands, and on this basis, design a digital transformation plan. In the actual and effective application scenarios of digital technologies, the universities should advance the infrastructure construction of digital technologies, optimize the digital system criteria, and iteratively optimize the application mode to achieve successful implementation of digital transformation in universities.

Secondly, data, computing power, and algorithms are demanded to deeply empower the organization and management innovation of universities, concern the institutional guarantee, and construct the digital organization structure of application-oriented universities. The initiation of digital transformation in universities should be motivated by mechanisms by designing and establishing an institutional framework suitable for the actual demands, improving the organization structure, and optimizing and modifying the working mechanism, thus contributing to the innovation and development of education models induced by digital technology innovation. This transformation requires the cooperation of different departments in universities to design plans for each transformation link and provide all-round support of technologies and services, forming a cohesive and functioning team. Additionally, application-oriented universities need to pay attention to cross-disciplinary construction to achieve mutual complementary and integration of disciplines, make dynamic adjustments during the development, and understand thoroughly the development tendency of disciplines under the wave of digital technology, improving the core competitiveness of the discipline system.

In addition, data management should be addressed to promote digital innovation and the development of teaching and scientific research. In this process, it is necessary to break through the data island to realize the interconnection of data in different information systems and also to establish unified specifications for data management and standardization, so as to achieve data classification and staging, effectively excavate their potential value supporting the entire digital system, and innovate the data service mode. The computing, storage, and communication capabilities of the digital system are applied to break through the blockages and bottlenecks in management, educational research, and scientific research, and advanced technical solutions are provided to ensure the construction of the digital running mode.

To advance the digital transformation of application-oriented universities, the digital skills of participants in all links are required to be strengthened to truly achieve the empowerment of digital technologies. Each participant should be equipped with digital capabilities matched to his function, including the digital decision-making thinking of the decision-making group, the digital management capability of the middle-level management team, the service ability of the digitization operators and maintainers, the digital teaching and research ability of the teaching and researching team, and the adaptability of students to digital teaching. Hence, all populations in universities can participate in and benefit from digital transformation, truly achieving the transformation. On this basis, it is necessary to further activate the mutual benefit of teaching and learning, stimulate the subjective initiative of teachers and students, and implement individualized teaching adhering to the student-oriented concept.

4. Conclusion

The digital transformation of education in application-oriented universities will accelerate social digitization, boost the development of the digital economy, and accelerate the construction of "digital China". However, deep integration of university education with digitization is a relatively long process. Therefore, the decision-making level should realize the significance of the digital transformation of education in application-oriented colleges. Meanwhile, the long-term development goal and key jobs of application-oriented universities should comply with the relevant requirements

for the digital transformation of education and realize the deep integration of digitization and education in universities according to their advantages and strategic objectives. On the road to the digital transformation of education, application-oriented universities should maintain a more open attitude and deeper innovation under the guidance of the digital China strategy, provide experimental fields and practical scenarios for the digital transformation of education, accumulate experience, and provide demonstrations to promote the systematic reform of higher education and advance high-quality development of higher education responding to rapid development.

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