

Research on the Development of American Education Informatization in the Post-Epidemic Era

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Abstract: Education informatization has entered the era of rapid development, and the reform of education will be the new normal of education. Taking American colleges and universities as an example, they reviewed the development of information teaching after the outbreak of the epidemic, analyzed the advantages and disadvantages of information teaching, and put forward constructive suggestions on this basis, which expects to provide reference for the development of China's education.

1. Introduction

The impact of the novel coronavirus epidemic on education is very huge, and China is about to take the lead in entering the "post-epidemic era". The "post-epidemic era" has not only brought many challenges to education and teaching, but also brought new opportunities, which makes the education reform urgent. The so-called "after the outbreak era", is not we think the outbreak of completely disappear, all back to the previous situation, but repeated outbreak, regional outbreaks may occur at any time, back from abroad, and seasonal attacks, and the virus has been mutation, spread faster area control, the impact on each industry is very huge. Simply put, we are never able to return to the same state, and so is education.

2. Review of the EU digitization policy

On 30 June, the European Commission adopted and released a new digital strategy aimed at creating a smooth interaction between people, processes, data and technologies to promote a fully digital European Commission. The strategy updates the Commission's Digital Strategy 2018, introducing an enterprise model that further streamlined the current IT process and a refusus on digital modernization and innovative service delivery.

The strategy includes five strategic goals: First, the cultivation of digital culture. Empower all employees and equip them with the necessary skills and tools to think about "digital first," while encouraging cross-functional teamwork to provide flexible, accessible digital workplace support. Second, set the preset digital conditions for EU policy. Ensure that digital technologies are considered from the beginning of the policy cycle to align the new policy with the digital decade development goals. Third, the digital transformation driven by the enabling business. Support all EU departments in using innovative technologies and data to reshape their business. Fourth, ensure

full coverage of the digital environment. Efficient management and streamlined IT system combination. Fifth, maintain a green, safe, and resilient infrastructure.

In the past few years, the European Commission has made great progress in its digital transformation. The digital workplace plans to move all employees to remote work quickly in the event of the outbreak. This strategy will drive the digital transformation of ECC, far beyond the IT category. The Commission will strengthen internal cooperation and knowledge sharing among departments and with member states, improve the digital skills of employees, support energy efficient IT equipment, and build a more sustainable Commission in new ways. Strong IT security management, a shift to a zero-trust architecture, and an enhanced employee network awareness program will all enhance the ECC's ability to withstand cyber threats. The Commission will also regularly track the progress of the digital committee to ensure the smooth implementation of the digital transformation.

With the new digital strategy, the Commission sets the example of the "European digital decade" for the digital transformation of the executive sector. The Commission wants to develop its technical potential by putting people and ensuring institutional sovereignty and resilience.[4]

3. The development process of educational informatization in the United States

Since the 1990s, the US government has introduced a series of policies and measures, and gradually formed the system incentive and policy support system for the development of informatization in universities. The "National Information Infrastructure Action motion" issued by the United States in 1993 proposed taking educational informatization as the basic direction and breakthrough point of educational reform in the United States.[1] One of the goals of the E-Learning National Educational Technology Plan, released in 2000, is to "use digital content and the Internet to change teaching". The 2004 Education Development Program, released in 2004, emphasizes the need to integrate digital and information technology into teaching and management. In 2010, the United States proposed the use of information technology to reconstruct education process and structure framework, 2015 put forward the theoretical framework of education informatization development, released in 2017, the implementation of the rural education informatization development strategy "success guide: rural school personalized learning implementation strategy", emphasize through the Internet, big data technology and the combination of education, promote the development of education informatization in rural areas. The plan of "Promoting the Application of Educational Technology in Teacher Training" recently issued by the US federal government is a special educational information reform document issued for the field of teacher education. These policies provide an institutional guarantee for promoting the development of education informatization in the United States. The United States attaches more importance to the top-level design of university informatization construction. In order to coordinate and guide the informatization work of colleges and universities and make it fit with the strategic goals of colleges and universities, the American Association of Higher Education Informatization was established to promote the informatization construction of colleges and universities and the development and utilization of teaching and management data. The association has launched the "Core Data Service Project" as a data sharing platform for American universities, helping higher education institutions to formulate their own unique information development strategies, rationally allocate information construction resources, and deal with related problems.

4. The development status of information education in the United States

Since the beginning of 2020, with the rise of online courses, not only students' learning methods are changing, but also teachers' teaching methods are adjusting. The whole education system

evaluates the students' education results, and the whole social system, including the job market, have undergone subtle changes.

4.1 Online courses will become more and more valuable

In the early stage of the implementation of online courses in schools, everyone was worried that the teaching effect was not good. In fact, some courses could not carry out distance teaching due to technical problems. Even with the support of network technology, it also affects the participation degree of teachers and students in some courses. However, after a short period of adaptation and adjustment, each school has now made the overall preparation from the technical level to the personnel level. In the future, even without the Novel Coronavirus epidemic, American universities will not reduce online courses, but add new online courses. After many schools were "forced" to practice distance teaching, various universities have accumulated rich experience and plan to offer more online courses. Especially in 2021, most schools have fewer students. Schools also have the opportunity to improve the enrollment rates of some courses and programs through distance learning. The transfer of courses to an online program, according to Ray Schroeder, which allows universities to admit more students than rely on local students. At the same time, large-scale open online courses (also called MOOC) are on the rise. As we all know, many famous universities in the United States offer free open courses, and online learners can take free or very cheap courses. In recent years, more and more universities have cooperated with MOOC platforms, including not only the Ivy League dream schools, but also many large public universities. The university offers various certificate courses, including undergraduate and master's degrees, at far cheaper prices than traditional methods. This means that students have access to more educational resources.[2]

In addition, technological improvements will also expand online courses, and "virtual reality" will enhance students' online interaction. For example, courses in biological laboratories are difficult to change to online courses, and technology through virtual reality can break down these barriers, making it easier to access actual courses online. The specific approach is: pointing to interactive video, online skills demonstration and online participation.

Currently, several nursing and science programs in American universities are using interactive video tools to conduct online courses. In general, the accessibility of educational resources is improving, and students can overcome space obstacles while being exposed to more high-quality resources. The teaching quality is constantly optimized, and online courses will become more and more valuable, which is very beneficial to students.

4.2 The results of online learning will become more and more concrete

In order to reflect the value of online courses, more courses will specify or digitize their learning results, so that students can better show their learning results. Over the years, various institutions in the United States, including universities and companies, have offered some certificate courses, such as professional certificates, electronic badges and other academic qualifications. Generally, these certificates focus on the delivery of specific skills in an industry. Before the outbreak, such classes often attract adult learners, especially when new skills need to be added when changing jobs. The future trend is that these certificates, badges, micro certificates will continue to grow. Not only the working staff, students also want to get a specific result, such as completion certificates and licenses, to prove their learning results.

Universities in the United States have also introduced programs, such as the grading of certificates. Students at different stages of study can take the exam and get the corresponding level of certificate. In this way, students will not only have a degree after graduation, but also have a certificate closely related to their major. Such programs are expected to increase in the coming

years for roughly the same reasons as other certificate courses. In particular, short-term certificates in technology education, such as healthcare or computer information, will continue to be more attractive to students and businesses. Professional skills certification and certificates can make job seekers more competitive.

4.3 Future study and employment model big change

The hybrid online and offline learning model will continue to exist in the future. After accepting and practicing the online teaching model, they also got used to this method. Therefore, the future online model will always be an alternative. For example, the former school may cancel a day course due to bad weather, but in the future, in similar situations, you can temporarily change the course to online teaching. The same is true at colleges and universities, where even if most campuses reopen and students have returned to school, courses are often taught face-to-face through mixed-learning and online.

No matter how the epidemic develops, this mixed teaching model is likely to become more common. In fact, the outbreak has become an opportunity for the paradigm transformation of higher education. To remain sustainable and replicable, future universities must embrace the digital future. "Because no matter how this happens, higher education will never return to the world it existed.

Online courses are increasingly valuable. Improving the enrollment rate of courses and programs is not limited to local students' MOOC free courses, virtual reality Online courses.

5. Research on American University Education Informatization

5.1 North Carolina State University: Refactoring the IT governance process

As part of its five-year IT strategic plan, North Carolina State University (NCSU) is committed to improving the design and functionality of IT governance to align its IT governance process with the university's mission. The IT work of NCSU adopts the joint form of all departments, with the CIO of the school CIO. There are independent IT groups in both the secondary college and the library, as well as independent distance education and learning technology departments. At the same time, the NCSU has established a Strategic IT Committee (SITC) to review high-level policies and develop large IT plans. In addition, four subcommittees address four key areas: teaching, academic research and creativity, operational management, and user experience. These subcommittees consisted mainly of stakeholders outside of the IT sector, including faculty members and decision makers in the university's academic and business departments. By incorporating stakeholders outside the IT sector in the IT governance design process, NCSU allows them to predict the potential impact of digital transformation based on their respective experience in teaching, research or management, preparing schools for rapid changes in technology and higher education. In addition, the school set up an annual review cycle to evaluate governance performance, review membership, and planning objectives.

5.2 University of Memphis: Experimental-driven IT innovation culture

The University of Memphis (University of Memphis) takes an experimental approach to determining its digital transformation strategy, designing the user experience as guided by a lean startup (Lean Startup) approach. Lean entrepreneurship is a popular and innovative methodology in Silicon Valley. Its core idea is to first put a minimalist prototype product in the market, and then quickly iteration and optimize the product through continuous learning and valuable user feedback, in order to adapt to the market. When designing a digital transformation strategy, the University of

Memphis's primary goal is not to achieve technology adoption, but to try to develop a culture of innovation. According to the lean entrepreneurship method, the school first launched an experimental project of artificial intelligence chatbot as the minimum feasible product, and established a relevant team with different disciplinary backgrounds. During the experiment, the team members constantly revised the goals and strategies through the investigation and improvement of the process. Through the continuous exploration of relevant experiments, the University of Memphis has greatly enhanced the ability of the digital transformation, and created an innovative atmosphere conducive to the digital transformation.

5.3 State University of New York-Oswego: Play a key role in the technology sector

The State University of New York at Oswego (State University of New York at Oswego, SUNY Oswego) has launched an IT strategy plan on digital campuses to support the wide application of technology on campuses. In SUNY Oswego's IT strategic plan, the digital campus is actually a technology ecosystem. To make the ecosystem flourish, the school has identified four core goals: adequate infrastructure, practical technical tools, clear digital service processes, and a skilled use of technology staff. To achieve the digital transformation goal, SUNY Oswego has set up a steering committee composed of representatives from various departments at all levels and levels to help guide the entire IT planning process. SUNY Oswego Point out that creating a digital campus ecosystem requires strong partnerships between schools and students and related partners, and that technical services must play a key role in it. To promote the healthy growth of the technology ecosystem, the technical services staff must assume various roles as leaders, collaborators, change agents, and managers. Based on this, SUNY Oswego provides IT service management training for all technical service department employees. In recent years, the university has also invested in a number of technological innovation projects, including virtual reality, one-click studios and maker Spaces.

5.4 Northeast Wisconsin Technical College: Using technology to improve equity

Northeast Wisconsin Institute of Technology (Northeast Wisconsin Technical College, NWTC) promotes a digital transformation strategy committed to using technology in innovative ways to improve fairness, organizational learning efficiency and student experience. According to relevant data released by NWTC, digital transformation improves the fairness and accessibility of learning. To improve equity, the school tries to tailor the teaching to meet the needs of each student and achieve personalized learning; to improve accessibility, the school increases more educational opportunities through digital transformation to better serve the populous Green Bay metropolitan area and many rural communities throughout its nine counties. For example, the NWTC is developing experiential learning laboratories to provide students and businesses with hands-on learning opportunities in AR / VR technology. In addition, NWTC uses technology to improve its day-to-day operations and student experience. A large number of software is applied to the daily management of the school, providing students with seamless, reliable and intangible communication and academic support. In addition, by migrating many tools to the cloud, NWTC is shifting the focus of its IT departments to vendor management. By establishing strong partnerships with suppliers, to promote technical partners to achieve higher standards, to ensure the reliability of relevant information systems and achieve the goal of digital transformation.

6. Enlightenment to the construction of college campus informatization in China

China's education "12th Five-Year" plan mentioned: "informatization plays a mission role in the development of education". Compared with American colleges and universities: At present, the campus informatization construction of Chinese colleges and universities lags behind in the system construction, team construction, technical service, and capital investment. In particular, there is still a big gap in the construction of electronic school affairs with information system sharing, data compatibility, and the promotion of the unified standardization of school management and service work [3]

Drawing on the experience of the development and practice of campus informatization, and combining with the running conditions and management system of Chinese universities, the author puts forward several suggestions on the construction of campus informatization in China.

(1) Maintaining information security and strengthening privacy protection is one of the problems that must be paid attention to in the development of colleges and universities. It is very important to improve the security and reliability of data processing and information technology. The United States attaches more importance to the security of data related to students. It has issued a number of bills requiring restrictions on the collection, storage and use of data of children, and made it clear that colleges and universities must do their best to ensure data security and protect students' privacy from illegal infringement when collecting and using the information of students. Some universities have set up specialized agencies to review data collection, analysis and use activities related to students. Still some colleges and universities remove students' campus card information and all the information that can be identified from their identity, and use a number completely unrelated to the student identity information for storage, and set a strict multi-person authorization electronic security key to ensure the security of students' data information. Our universities can also learn from it.

(2) Improve the overall decision-making ability and financial management efficiency of universities. The application of big data also involves policy formulation and implementation in finance, personnel, business, investment, strategy, management and other aspects. Using big data technology, universities can comprehensively observe their financial and policy implementation, and at the same time, improve the accuracy and effectiveness of investment and operation by mining and analyzing relevant data, so as to improve the financial management situation. Bucknell university set up a "school wisdom plan", from the dean of academic office, office of admissions director, director of financial aid office three departments to collect data, for the financial and human resources related affairs, decision-making support, and through the measured performance, tracking research yield, research funds use direction and timely find potential fraud. The University of Miami has developed an intelligent plan based on big data to understand the revenue sources of each department, analyze and optimize financial management. Tufts University uses big data analysis to understand students' evaluation of teachers.

(3) Improve the modernization level of university management. The development and integration of big data and the improvement of information management level not only greatly simplify and optimize the management network, framework and chain of universities to better perceive diversified and complex information and conduct forward-looking intelligent management to fill the management loopholes; they also help scientific decision-making and improve financial management efficiency and the overall competitiveness of universities; but also strengthen the information, network and intelligent cognition of teachers, managers and students, and enhance their professional skills, employment adaptability and competitiveness in the job market.

7. Conclusion

The management of colleges and universities is faced with increasingly complex and diversified problems and needs to improve the quality and efficiency, so the traditional management mode is difficult to adapt to the relevant needs. Therefore, it is necessary to build an "information campus" and attach importance to the processing of relevant big data in colleges and universities. We will adopt reliable data processing technology and networks to collect, mine, analyze, and store various structured or unstructured university management data, including teaching resources and student information, and transform them into effective resources for university management and services. At the same time, we will build an integrated operation management framework to improve the level of informatization throughout the entire process of university operation management.

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