

Research on Digital Governance Model in Universities Based on Students' Behavioral Data

Wei Hao, Yang Wang

Liaoning He University, Shenyang, Liaoning, 110163 China

Abstract: Taking the educational digital transformation in Liaoning HE University as the background, this paper manages to present students' portrait of their learning and life on campus, and establish the digital governance model based on students' behavioral data. Meanwhile, it is expected to provide reference for the reform of university digital governance model through the combination of technical research and practical exploration.

Keywords: Behavioral Data; Universities; Digital Governance

The rapid development of information technology has pushed forward the reform of higher education in China. As the main body of higher education, universities are facing unprecedented challenges, and embracing new development opportunities as well, and the digital transformation of the governance mode in universities has also gained real driving force. Through the collection, analysis and processing of education big data, universities can deeply explore the laws and tendencies contained in the data, accurately evaluate the educational work and students' growth, so as to propose targeted solutions, and carry out personalized cultivation, thus truly realize individualized education.

1. The necessity of digital transformation in university governance

1.1 The traditional governance mode in universities cannot meet the needs of the digital development of higher education

At present, university governance is mainly based on traditional hierarchical resource management, which has the advantages of clear division of labor, strong standardization and stable implementation. In general, it can maintain the normal operation of universities. However, under the new situation of the rapid development of education digitization, its limitations and drawbacks gradually appear. First, the single organizational structure leads to low efficiency of information transmission, and the veracity is unable to be guaranteed. The daily work of universities involves a large amount of information and data. The word-of-mouth sharing mode is easy to cause information deviation and data errors, which may affect the work efficiency, or even cause decision-making errors. Second, "isolated information islands" limit feedback and work improvement. With the development of educational informationization, many businesses in universities have gradually become electronic. However, due to the decentralized setting of departments and the lack of linkage, tasks are mostly in the state of independent operation, forming a lot of "isolated information islands". At the same time, because of the lack of interaction platform between faculty and staff, even sometimes they have doubts and questions about decisions or information, there is no smooth feedback path. This is not conducive to work optimization.

1.2 The realization of personalized educating goal in higher education needs the support of data technology

The Outline of the National Program for Medium - and Long-term Education Reform and Development (2010-2020) emphasizes: "We should put people first, establish diverse views on talents, respect students' individuality, and encourage educators to create an environment that supports students' individualized development." The premise of personalized education is to master the personality of the students, and then make an accurate judgment. It is difficult to do this simply by relying on the subjective observation and

evaluation of the educator, it needs the support of certain science and technology and education big data. Universities can discover the characteristics of students and tap their potential through behavioral data. On the basis of establishing the awareness of data-driven education and strengthening the learning of data application and analysis technology, universities can use digital tools to provide targeted services and realize personalized education in the digital environment.

2. Design and implementation examples of digital governance path in universities

In response to the new requirements of higher education development in the digital era, Liaoning HE University has comprehensively started the process of education digital transformation in recent years. On the basis of fully updating the education concept and increasing the construction of digital technology conditions, the university has designed and constructed the “digital governance mode based on students’ behavioral data”, precisely deployed and implemented in an orderly manner.

2.1 Define digital governance objectives

The educational digital transformation measures of Liaoning HE University are closely in line with its educational reform purpose of “student-centeredness”. In combination with the application-oriented school-running attributes of Liaoning HE university, the digital governance objectives are set as follows: With education as its core, under the data driven, relying on digital management systems, set up data linkage; based on students’ behavioral data, carry out personalized cultivation, precise guidance and ability building; “set each student’s achievement at the center of education”, so as to realize the educational goal of “letting each student obtain the best development and become unique”.

2.2 Establish a digital governance environment

2.2.1 Configure the business management systems and establish the management system.

Since 2020, Liaoning HE University has purchased and improved the management systems of each department in a planned and step-by-step manner according to the work plan of educational informatization construction and digital transformation. It has successively introduced and updated the teaching affairs management system, examination management system, student affairs management system, employment management system, personnel management system, financial management system, library management system, psychological general testing system, and the “XuetangX-Rain Classroom integrated teaching platform”, laying a sufficient hardware foundation for the implementation of digital transformation. At the same time, according to the idea of digital governance path based on students’ behavioral data, the functions of each management system and platform are comprehensively cleared and improved so as to ensure that the module fields are complete and the functions are convenient and efficient.

2.2.2 Build a smart campus and realize data linkage.

Liaoning HE University has set up sufficient technical conditions for digital transformation governance. At present, it has achieved full coverage of the 10-gigabit backbone and 1-gigabit desktop network, and set up wired and wireless networks to guarantee the daily work, teaching and life of all teachers and students, and complete the mobile Internet 5G ecology as well. The network environment is safe and reliable, high-speed and smooth, and low delay. The university has built the information standard system, and preliminarily realized smart teaching, smart presentation and smart management, and used the advantages of big data center to complete the docking of overall online teaching. Meanwhile, the smart campus service platform has been established to quickly respond to the service needs of teachers and students, and realize the full process coverage and paperless office. Campus IOT sensing facilities have been established, such as face recognition, card-free campus life and consumption. The construction of a “smart campus” with a platform of “digital campus” and two centers of “identity authentication center and information center” as the general framework has been fully launched. The interfaces of various business systems have been opened and integrated, barriers have been broken down, and data linkage and sharing have been realized.

2.3 Draw a data portrait of student behaviors

The idea of digital governance of Liaoning HE University stems from the concern and thinking about the growth process of students. It fully implements the educational concept of “student-centeredness” and carries out personalized cultivation, precise guidance and ability building for students, in order to realize the innovative “individualized education in accordance with students’ aptitude” in the digital era. Therefore, the university takes the whole process of students in the university as the research object, carries out detailed data description for students’ behaviors in all aspects of learning and life, so as to accurately locate service points and guidance directions. The current research involves two aspects of student behaviors: “my life” and “my study”, with a total of 10 dimensions. Among them, “my life” includes five dimensions: “accommodation service”, “mental health”, “reading service”,

“financial aid”, “catering service”; “My learning” includes five dimensions: “teaching resources”, “blended teaching and learning”, “teaching quality monitoring”, “academic warning” and “further study and employment”.

2.4 Digital governance tasks based on students’ behavioral data

Liaoning HE University uses the smart campus platform to survey and collect students’ behavioral data through various business management systems and teaching platforms, understands students’ life background, preferences, needs, etc., and provides targeted services and conditional support for students. At the same time, the university tracks and checks students’ daily decisions and variables, combining with students’ personal differences, predicts and discovers students’ abnormal behaviors, and then sends early warning information immediately, and researches and proposes personalized solutions. Digital governance tasks include specific objectives, project measures, required support systems and platforms, and division of labor between departments. According to the nature of the tasks, the university schedules the completion time, formulates the standards, and carries out the regular inspections and feedbacks to find deficiencies and timely adjust and optimize the governance path.

2.4.1 Digitization precisely serves “Students’ Life”

Liaoning HE University pays attention to the life needs of each student, and provides practical and accurate services for students from all aspects through the analysis of students’ data. Taking the student accommodation service as an example, the university has broken the previous dormitory allocation method based on the major grade, and is committed to creating a “life-learning community” based on the background and characteristics of students to provide quality accommodation services for students. According to the National College Student Study Survey, roommate relationship is one of the highest and most important indicators of college students’ satisfaction in the process of learning and growth. As the most closely connected peer group, the roommate relationship is the growth fulcrum of the learning process. Liaoning HE University carefully arranges dormitory according to students’ background by investigating their family living areas and physical conditions, builds a learning and living community, and arranges different general education courses and collective academic activities for each dormitory building, so that students with compatible personality and behavioral styles and complementary academic abilities can form a life-learning community as soon as possible. In the academic activities, the dormitory building can be taken as the unit to form a team, the students in the same building can discuss, go out and make speeches together. At the same time, the university calls on students to design their dormitories, thus cultivate the spirit of respecting multiculturalism.

In addition, the university makes full use of big data to provide personalized services and guidance to students in terms of mental health, reading habits, financial aid and catering services. The Mental Health Center of the university carries out psychological monitoring of students’ daily life through data linkage of teaching affairs management system, student affairs management system and psychological general testing system. At the same time, it organizes a psychological test covering all students once a year to timely issue early warning and carry out necessary intervention for abnormal data to ensure students’ mental health in an all-round way. The university library makes statistics and analyzes the historical borrowing situation from the aspects of literature categories and readers through library management system, so as to understand students’ reading preferences, guide students to read beneficial books, and purchase and recommend books more in line with students’ needs. Through the records of students’ food and beverage consumption, the university can understand students’ food taste preferences and set up canteen stalls to meet students’ needs. At the same time, according to the daily consumption records of students, the university can get to know the family background of students who may have difficulties in life, and make aid plans, set up work-study positions, and implement targeted and precise funding.

2.4.2 Digitization effectively helps “Students’ Study”

In order to make students have a comprehensive understanding of their majors, the Strategic Brand Department of Liaoning HE University has carefully planned, supervised by the deans of professional colleges, to create a series of major introduction videos. At the same time, HE university prepares the “gift package of e-learning resources” for students, which contains the course overview, reference books, electronic video resources of the courses and so on. The package is released to students by academic year to fully meet the needs of students for preview, self-study and extended learning. Under Covid-19, while coping with the challenges, Liaoning HE University grasps the development opportunities, introduces online teaching platform, builds smart classrooms, and strengthens the exploration and reform of blended teaching and learning. The university organizes and reconstructs the course content teaching system, optimizes teaching process, builds online autonomous learning resources, designs classroom teaching activities, and presents the students with the exciting online and offline hybrid live broadcast/recorded classrooms under the networked and intelligent teaching environment.

The new teaching model clarifies the “student-centeredness” teaching concept, uses big data, learning analysis and other

technologies to implement the diagnosis and analysis of learning situation and intelligent resource push, and innovate the teaching quality monitoring and student learning evaluation system. Liaoning HE University makes full use of the data linkage of “Teaching Affairs Management System”, “Student Affairs Management System” and “XuetangX-Rain Classroom integrated teaching platform” to track and check the students’ preview, classroom attendance, classroom performance, homework completion, and examination conditions etc. By viewing the data of “Learning Situation Classroom report”, teachers can accurately understand students’ pre-class preparation, in-class learning and homework answering, and carry out comprehensive statistical analysis to understand students’ self-learning ability, and to provide targeted remedial intervention measures for the detected deficiencies. For example, teachers can analyze students’ online classroom participation based on the bullet screen data, so as to achieve two goals: First, through the situation of students sending bullet screen in each class, teachers can obtain the discrete situation of participation in each class and which students have weak participation, then to carry out targeted tracking and guidance. Second, through the distribution of bullets for a course in a semester, teachers can find out what kind of teaching content can stimulate students’ enthusiasm for participation, so as to improve their teaching design.

In addition, the university has established an academic warning system. Through the network access of different locations on campus, the Student Affairs Department can compare the information of students’ consumption time and class time, confirm and give early warning in the first time when time conflicts are found. At the same time, through the data linkage between the student affairs management system and the examination management system, according to the requirements of the major education program, students and parents will be issued with a regular warning of the completion of single-subject courses and major credits. In the aspect of employment services, with the help of Mycos graduate tracking and monitoring system, the Employment Management Department and Supervision Office analyze the professing employment ability and professional knowledge demand of each major, and provide targeted employment guidance to students. At the same time, the university investigates the further study situation of the graduates in each major, the importance of core courses and the satisfaction degree of students, and the demand and satisfaction degree of post ability, so as to optimize the major education programs and curriculum settings.

3. Key technical indicators of university digital governance

3.1 Business system functions and data linkage

The key points that distinguish digital governance from traditional university governance mode are precise positioning and efficiency improvement. Data linkage between systems and platforms is the core technical requirement for digital governance. Due to the multiple dimensions, diverse needs and many business management systems in university governance, the functional integrity of each system needs to be fully guaranteed, and the smooth linkage of data between systems needs to be realized at the same time. For a long time, there is an isolated information island problem between various departments in university governance, which makes the work cannot be effectively connected and affects the sharing of data. Therefore, universities need to build big data information platform, improve the use efficiency and sharing of data, and then accelerate the speed of data mining and analysis effect, and give full play to the value and role of data.

3.2 Network security and Students’ Personal information protection

The development of educational informatization promotes the intelligent process of higher education, and also puts forward higher requirements for the network security of universities. Both the Civil Code and the Network Security Law recognize the privacy of university students’ personal information. In the process of implementing digital governance, universities should attach great importance to and take necessary policies and measures to fully protect students’ personal information. For example, while following relevant national laws and regulations, universities should issue rules and regulations concerning the protection of students’ personal information, clarify the work duties and responsibilities of relevant personnel, and strictly supervise the behaviors of each responsible subject. At the same time, increase network security technology guarantee, and strengthen teachers’ and students’ personal information security self-protection education.

3.3 Digital literacy of faculty and staff

Faculty and staff are the main implementers of university governance and the key element of digital transformation of higher education. In order to ensure the effective integration of university governance and information technology, faculty and staff need to establish data thinking consciousness and constantly improve the application level of data technology. In daily work, they should improve their sensitivity of data information, collect and integrate useful information consciously. At the same time, actively learn data management and data analysis skills, and try to innovate business management mode. On the other hand, higher education in the digital era also puts forward new requirements for teachers’ teaching ability. Universities should provide policy guarantee

and training opportunities to improve teachers' digital teaching ability. For example, establish a teacher professional development system, provide teachers with workshops on the application of technology innovation and network transformation teaching, personalized counseling, successful cases of teaching skills, and training on digital teaching curriculum design. At the same time, teachers should also carry out independent learning based on open educational resources to achieve independent improvement of digital teaching ability.

4. Conclusion

The digital transformation of higher education is an epoch-making systematic project. In this process, the digital transformation of university governance is imperative and of great significance. The "digital governance model based on students' behavioral data" discussed in this paper is only a part of university governance, with many difficulties and problems as well as opportunities and challenges. In the future, HE university will continue to explore in depth, follow the law of higher education, respect students' growth personality, comply with the development characteristics of times, keep learning, constantly improve the digital level, and enhance the digital governance ability.

References:

- [1] International Center for Higher Education Innovation under the auspices of UNESCO, Institute of Education, Tsinghua University. Research Report on Digital Transformation of Higher Education Teaching and Learning[R]. April, 2022.
- [2] EDUCAUSE. 2022 EDUCAUSE Horizon Report – Teaching and Learning Edition[R]. April 18, 2022.
- [3] Li Zhiyao, Zhang Mengsi. Exploration and Practice of digital transformation of university governance [J]. Exchange Experience, 2022/4(first half): 56-58, 73.
- [4] Chang Tongshan. Accelerating Digital Transformation to Enhance Effectiveness of Governance in Higher Education: The USA's Experience and Its Implications for China [J]. The Chinese Journal of ICT in Education, No. 2, 2022: 13-26.
- [5] Xiong Guifang, Guo Runping. Analysis on the Innovation Path of University Education Management Informatization in the Era of Big Data [J]. Science & Technology Information, 2022 No. 8:16-18.
- [6] Wang Xiaoqian, Zhang Yu. The Strategic Choice of Chinese University Governance in the Post-Epidemic Era [J]. China Higher Education, 2021(5):51-53.
- [7] Fu Tiejian. University Governance Changes from "Resource Management" to "Digital Governance" [J]. China Journal of Multimedia & Network Teaching, 2021(1):121-123.
- [8] Lin Qin, Chen Changhui, Jia Zhiwei. Application Exploration of Behavior Portrait Analysis of Higher Vocational Colleges Students Based on Big Data Modeling[J]. Modern Information Technology, Mar, 2021, Vol.5 No.5:19-22,25.

About the author:

Wei Hao (1974.02-), male, Han Nationality, Shenyang Liaoning, PhD, Professor of Liaoning He University, Research Fields: Higher Education