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Research and Practice on the Construction of the "Three-All" Education Mechanism in Colleges and Universities under the Background of Digital Intelligence

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Abstract: *Digital intelligence technology provides a new path for the "Three-All" education mechanism in colleges and universities to break through the constraints of time and space and solve the barriers to collaboration. Combining with the practical experience of talent cultivation in colleges and universities, this paper analyzes the core value of digital intelligence empowering the "Three-All" education, sorts out the existing problems in the current mechanism construction, such as "data silos", disjointed collaboration among all participants, and rigid education scenarios. Furthermore, from the three dimensions of "collaboration among all participants", "reconstruction of the whole process" and "expansion of all-round scenarios", the paper puts forward practical strategies, including building an education community relying on digital intelligence platforms, optimizing education links driven by data, and enriching education carriers through technological innovation. It aims to provide a feasible reference plan for colleges and universities to improve the effectiveness of talent cultivation.*

Keywords: *Digital Intelligence; Colleges and Universities; "Three-All" Education; Mechanism Construction; Education Practice*

1. Introduction

The “Three-All Education” approach—encompassing all staff, all processes, and alldimensions—is an innovative platform for enhancing ideological and political education (IPE) in universities while imparting knowledge. [1]The talent cultivation work in colleges and universities in the new era is faced with the challenges of "diversified students' needs, decentralized education participants and fragmented education scenarios", and the traditional "Three-All" education mechanism has gradually shown limitations in terms of collaboration efficiency and accuracy. “Three-All Education” is an educational mode of all-staff-in-charge education, all-process education and all-round education.[2]With the in-depth penetration of digital intelligence technologies such as big data, artificial intelligence and the Internet of Things in the field of education, "empowering education with technology" has become an important direction for colleges and universities to implement the fundamental task of fostering virtue through education. Digital intelligence can not only break the communication barriers among education participants such as teachers, counselors, administrative staff and logistics support personnel, but also realize the dynamic tracking and accurate analysis of students' growth data. Moreover, it can expand the education scenarios beyond the classroom, promoting the "Three-All" (all participants, whole process and all aspects) education from "the implementation of concept" to "the upgrading of effectiveness". Based on this, combining with the practical experience of talent cultivation in colleges and universities, this paper explores the construction logic and practical path of the "Three-All" education mechanism under the background of digital intelligence, aiming to solve the pain points of the traditional education mechanism and provide new ideas and methods for colleges and universities to improve the quality of talent cultivation.

2. The Core Value of Digital Intelligence Empowering the "Three-All" Education Mechanism in Colleges and Universities

With the increasing diversity in society’s demands for talent, a singular focus on knowledge and technical skills is no longer sufficient. [3]Digital intelligence is not a simple "superposition of technologies", but injects new vitality into the "Three-All" education mechanism through data

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integration, intelligent analysis and scenario reconstruction. Its core value is concentrated in three dimensions, which are highly consistent with the core requirements of the "Three-All" education.

First, it builds a "collaboration hub" for "education by all participants" and solves the problem of decentralized participants. In the traditional education mode, teachers focus on the imparting of professional knowledge, counselors concentrate on ideological guidance and daily management, while administrative and logistics personnel pay attention to service support. Most of these participants "exert their efforts unilaterally" and lack a unified communication and collaboration platform, which leads to the dispersion of education resources and inconsistency in education goals. Digital intelligence technology can build a unified "education collaboration platform" and integrate all participants into the same system: teachers can upload students' classroom performance and academic difficulties in real time, counselors can update students' ideological dynamics and living needs simultaneously, and logistics personnel can feedback problems in service scenarios such as student dormitories and canteens. Through the platform, all participants can realize data sharing and demand communication, forming an education community characterized by "initiation by one party and response by multiple parties", and transforming "education by all participants" from "fighting separately" to "fighting in synergy".

Second, it provides "data support" for "education throughout the whole process" and improves the level of precise education. "Education throughout the whole process" requires covering the entire cycle of students from enrollment to graduation. However, in the traditional mode, students' growth data are mostly in the form of "paper files" and "phased records", which makes it difficult to realize dynamic tracking and systematic analysis. As a result, education measures are mostly "one-size-fits-all" and cannot accurately match the personalized needs of students. Digital intelligence technology can construct "students' growth data portraits": it collects data of students in all links, such as adaptation to enrollment, course learning, club activities, internship and practice, and career planning, through intelligent terminals. Then, with the help of big data analysis technology, it explores the laws behind the data—such as identifying the weak links of students with academic difficulties, predicting the potential needs of students with psychological fluctuations, and locating the advantageous directions of students engaged in innovation and entrepreneurship. Furthermore, it customizes "personalized education plans" for different students, transforming "education throughout the whole process" from "experience-based judgment" to "data-driven".

Third, it expands the "scenario boundary" for "all-round education" and breaks the constraints of time and space. The traditional "all-round education" is mostly limited to the scenarios of "classroom + campus", and the off-campus and after-class education carriers are relatively single, which is difficult to meet students' needs for fragmented learning and diversified growth. Digital intelligence technology can expand the breadth and depth of education scenarios through the integration of "online + offline": online, an intelligent learning platform can be built to push personalized content such as ideological and political micro-courses, professional expansion and mental health knowledge, allowing students to participate in education activities anytime and anywhere; offline, with the help of the Internet of Things technology, intelligent interactive terminals can be set up in public spaces of the campus such as libraries, canteens and dormitories, integrating education elements such as red culture, school rules and disciplines, and safety knowledge, so as to realize the goal of "every corner of the campus is a classroom"; in addition, VR/AR technology can be used to restore revolutionary historical scenarios and simulate workplace practice environments, making ideological and political education and vocational education more immersive, and transforming "all-round education" from "fixed scenarios" to "all-region coverage".[4]

3. Practical Difficulties in the Construction of the "Three-All" Education Mechanism in Colleges and Universities Under the Background of Digital Intelligence

Although digital intelligence provides advantages for the construction of the "Three-All" education mechanism, from the current practical situation of colleges and universities, affected by factors such as technology application, mechanism guarantee and personnel capability, the mechanism construction still faces many practical difficulties, which restrict the play of the effectiveness of digital intelligence education.

First, the phenomenon of "data silos" is prominent, which restricts the efficiency of collaboration among all participants. In the process of digital intelligence construction in some colleges and universities, there exists the situation of "each department independently developing systems": the

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Academic Affairs Office has an "academic management system", the Student Affairs Office has a "student management system", and the Logistics Group has a "service support system". However, the data standards of these systems are not unified and the interfaces are not interconnected, thus forming "data silos". For example, the data of students' failed courses in the Academic Affairs Office cannot be synchronized to the counselors' system, which makes it difficult for counselors to intervene in academic assistance in a timely manner; the psychological early warning data in the Student Affairs Office cannot be shared with teachers, which makes it difficult for teachers to cooperate in guidance in class. In the end, the "collaboration among all participants" only stays on the surface, and the "hub role" of the digital intelligence platform cannot be brought into play.

Second, the application of technology focuses on "form rather than actual effect", resulting in insufficient accuracy of education throughout the whole process. Some colleges and universities blindly pursue the "hardware investment" in digital intelligence, introducing big data analysis platforms and intelligent interactive equipment, but ignore the "adaptability between technology and education needs": on the one hand, there is a problem of "fragmentation" in data collection. On the one hand, there is a "fragmentation" problem in data collection, which only focuses on "explicit data" such as students' academic scores and attendance, while insufficiently collecting "implicit data" like ideological dynamics, interpersonal communication and values. This leads to incomplete "students' growth data portraits" and fails to support precise education. On the other hand, there is a problem of "valuing statistics over application" in data analysis. It can only output basic statistical results such as "students' failure rate" and "activity participation rate", but cannot explore the educational needs behind the data. In the end, the "education throughout the whole process" still follows the traditional model, and the "data support" role of digital intelligence becomes a mere formality.

Third, the digital intelligence capabilities of personnel vary greatly, making it difficult to implement "all-round" digital intelligence education scenarios. The implementation of digital intelligence education relies on the digital intelligence capabilities of education participants such as teachers and counselors. However, at present, some education participants in colleges and universities still have "ability shortcomings": first, "insufficient technical cognition" — some elderly teachers and administrative staff regard digital intelligence as an "additional burden", are unwilling to take the initiative to learn the operation of intelligent platforms, and still rely on traditional working methods; second, "lack of technical application capabilities" — even if they master platform operations, they are unable to integrate digital intelligence technology with their own education work. For example, teachers cannot use intelligent platforms to design "personalized teaching plans", and counselors cannot predict students' needs through data analysis. As a result, it is difficult to implement the digital intelligence-expanded education scenarios such as online education and immersive education, and the boundary of "all-round education" cannot be effectively expanded.

Fourth, the mechanism guarantee is incomplete, and digital intelligence education lacks long-term support. The construction of the "Three-All" education mechanism under the background of digital intelligence requires supporting systems, funds and assessment mechanisms as guarantees. However, some colleges and universities still have "guarantee gaps": first, the lack of "data security management systems" — students' growth data involves personal privacy, and without strict authority management and data encryption mechanisms, it is easy to trigger the risk of privacy leakage; second, the lack of "personnel incentive and assessment mechanisms" — the work of digital intelligence education is not included in the performance assessment of teachers and counselors, leading to the lack of motivation for some education participants to take the initiative to participate in digital intelligence construction; third, insufficient fund guarantee — the maintenance and upgrading of digital intelligence platforms, as well as the training of personnel's digital intelligence capabilities, all require continuous capital investment, and some colleges and universities have unreasonable fund allocation, making it difficult to promote digital intelligence education in a sustainable way.

4. Practical Paths for the Construction of the "Three-All" Education Mechanism in Colleges and Universities Under the Background of Digital Intelligence

In response to the above difficulties, colleges and universities should focus on "solving pain points and focusing on practical effects", and start from the four aspects of "data integration, technology adaptation, ability improvement and mechanism guarantee" to build a digital intelligence education mechanism characterized by "synergy among all participants, precision throughout the whole process and coverage in all aspects", so as to promote the in-depth integration of digital intelligence and the "Three-All" education.

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4.1 Break "Data Silos" and Build a Digital Intelligence Platform for "Synergy among All Participants"

As an important part of cultivating qualified builders and reliable successors in universities, the practical education is in line with the basic rule of university students' growth and development.[5]Following the principle of "unified standards, interconnection and sharing", colleges and universities should reconstruct the digital intelligence education platform, solve the problem of data interconnection, and lay the foundation for synergy among all participants. On one hand, the university establishes a "unified data standard" to define the scope and format of data collection across departments. This includes student basic information, academic performance, ideological data, and service records, all adhering to a unified standard to ensure data is "shareable and analyzable." On the other hand, a "one-stop collaborative hub platform" is built to integrate system resources from the Academic Affairs Office, Student Affairs Office, and Logistics Group. By connecting data interfaces, it enables "single-data-collection, multi-department-sharing." Additionally, differentiated permissions are set for different stakeholders: instructors can access student academic data and submit support suggestions; counselors can consolidate comprehensive student data and initiate collaborative requests; administrative staff can report service issues and track resolution progress. This creates a collaborative mechanism where "data, needs, and responsibilities are interconnected." For example, in the "education collaboration platform" built by a certain college and university, after the Academic Affairs Office synchronizes the data of students' failed courses, the platform will automatically send "assistance reminders" to counselors and teachers. Counselors take the lead in formulating assistance plans, teachers provide academic tutoring, and logistics personnel guarantee the learning environment during the assistance period, realizing "joint efforts of multiple parties".

4.2 Focus on "Precise Adaptation" and Construct a "Whole-Process" Data-Driven Education Process

Centering on "complete portraits and precise application", colleges and universities should optimize the links of data collection and analysis, so that digital intelligence can truly support education throughout the whole process. First, the universities expand the dimension of data collection to realize the full coverage of "explicit data + implicit data": collect explicit data such as students' classroom interaction and academic scores through intelligent classroom terminals, collect life data such as students' consumption and travel through campus all-in-one cards, and collect implicit data such as students' ideological dynamics and psychological status through online questionnaires and psychological assessment systems, so as to construct a "complete and dynamic student growth data portrait". Second, they strengthen the "application orientation" of data analysis and build an "intelligent education decision-making module": use artificial intelligence algorithms to conduct in-depth analysis of students' growth data. For example, identify the causes of students' academic difficulties (whether it is a problem of learning methods or life pressure) through "academic data + life data", and judge students' value tendencies through "ideological data + activity data". Then, the universities automatically generate "personalized education suggestions" — such as pushing "learning method micro-courses" to students with academic difficulties, matching "exclusive counselor assistance" to students with psychological fluctuations, and recommending "practical project resources" to students engaged in innovation and entrepreneurship, so as to realize precise education throughout the whole cycle of "enrollment — cultivation — graduation". The concept of “three-all education” is an important guide for colleges and universities to cultivate the talents needed by modern society.[6]

4.3 Strengthen "Ability Improvement" and Promote the Implementation of "All-Round" Digital Intelligence Education Scenarios

By means of "hierarchical training and practical empowerment", colleges and universities should improve the digital intelligence capabilities of education participants, so that the education scenarios expanded by digital intelligence can be truly implemented. The digitalization of education promotes the transformation and development of education.[7]On the one hand, universities carry out "hierarchical and classified digital intelligence ability training". For education participants with "insufficient technical cognition", they provide "basic operation training", focusing on explaining the use methods and core functions of digital intelligence platforms to eliminate "technical fear". For those with "lack of application capabilities", the institutions launch "practical skill training" — for example, training teachers on "personalized teaching design with intelligent platforms" and "skills of integrating online ideological and political elements", while guiding counselors in "data-based student management" and "intelligent psychological early warning analysis". Such targeted training ensures all participants can "use and make good use of" digital intelligence technology. On the other hand, universities build a "digital intelligence education practice exchange platform" and organize teachers and counselors to

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hold "digital intelligence education case sharing sessions". Specifically, they invite excellent teachers to share experience in "carrying out red culture ideological and political courses with VR technology", and invite counselors to present cases of "carrying out precise assistance through data analysis". By taking "practical cases" as a driver for ability improvement, universities further promote the implementation of scenarios like online education and immersive education — for instance, teachers use VR technology to restore the "Long March scenario", making ideological and political education more appealing; counselors push "employment guidance micro-courses" to off-campus internship students via online intelligent platforms, thus realizing education coverage in "off-campus scenarios".

4.4 Improve "Mechanism Guarantee" and Consolidate the Long-Term Foundation of Digital Intelligence Education

With the advent of the digital age, in colleges and universities, the management system of innovation and entrepreneurship education is facing new opportunities and challenges.[8]Aiming at the goals of "safety, incentive and sustainability", colleges and universities should establish a sound mechanism guarantee system to provide long-term support for digital intelligence education. First, universities improve the "data security management system", clarify the process of data collection, storage and use, set "hierarchical authority management" (for example, ordinary teachers can only check students' academic data, while counselors can check all-dimensional data but cannot disclose it), and adopt technical means such as data encryption and regular backup to ensure students' privacy security and eliminate the worries of "data sharing".

Second, they establish the "digital intelligence education assessment and incentive mechanism", and incorporate digital intelligence education work into the performance assessment of teachers and counselors. For instance, they include indicators such as "frequency of using intelligent platforms", "quality of personalized education plan design" and "effectiveness of data-driven education" into the assessment, and provide "priority in evaluation and selection and bonus incentives" to outstanding participants, so as to stimulate the latter’s motivation to participate in digital intelligence construction.

Third, the institutions optimize the "fund guarantee mechanism", incorporate digital intelligence education funds into their annual budget, and focus on investing in the maintenance and upgrading of digital intelligence platforms, digital intelligence ability training and the update of intelligent equipment, so as to ensure the sustainable promotion of digital intelligence education work. Under the perspective of the "Three Complete Education", the work of the Construction of the "Three-All" Education Mechanism is a long-term and complex task.[9]

5. Conclusion

In the new era of accelerated digital transformation, cutting-edge technologies such as artificial intelligence, big data, and cloud computing are triggering profound changes in the field of education.[10]Under the background of digital intelligence, the construction of the "Three-All" education mechanism in colleges and universities is not only an inevitable requirement for implementing the fundamental task of fostering virtue through education in the new era, but also an important path to solve the problems of traditional education. At present, although the mechanism construction faces difficulties such as "data silos", ability shortcomings and insufficient guarantees, as long as colleges and universities adhere to the principle of "taking education needs as the orientation, technical application as the support and mechanism guarantee as the foundation", and make efforts from the three core dimensions of "synergy among all participants, precision throughout the whole process and coverage in all aspects", they can promote the in-depth integration of digital intelligence and the "Three-All" education, and truly realize the "upgrading of education effectiveness". In the future, with the continuous development of digital intelligence technology, colleges and universities need to continue to explore new adaptation points between "technology and education", such as using AI large models to carry out "personalized ideological and political guidance" and relying on the Internet of Things technology to build "smart campus education scenarios", so that digital intelligence can truly become a "new engine" for the education work in colleges and universities, and provide stronger support for cultivating new people of the era who are capable of shouldering the responsibility of national rejuvenation.

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