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# Crisis and Countermeasures of Digital Transformation in American Higher Education: Based on the Perspective of Students' Subjectivity

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**Abstract:** Digital transformation is the inevitable trend of higher education development in the era of artificial intelligence. The digital transformation of higher education brings many opportunities and challenges to education at the same time. As an important subject in education, students' subjectivity needs to be reinterpreted in the era of artificial intelligence. The digital transformation of higher education has brought a series of crises to students' autonomy, initiative and creativity, which are mainly manifested as the autonomy crisis caused by the frequent occurrence of mental health problems, the virtualization of self-cognition and control ability, the initiative crisis caused by information cocoon, social and emotional distortion, and the creative crisis caused by students' unequal development, insufficient self-worth cognition and alienation of educational purpose. Reflecting on the reconstruction of students' subjectivity in the era of artificial intelligence, education should face up to the use of digital tools to return to education itself as the ultimate goal, cultivate students' technological connection and sense of belonging to promote the positive interaction between people and technology, and improve the digital literacy and ability of each subject to adapt to the development of The Times.

**Keywords:** students' subjectivity; the age of artificial intelligence; digital transformation in higher education

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## 1. Introduction

The rapid development of digital technology is profoundly changing the way people live, produce and learn. The penetration of digital technology into society is comprehensive, comprehensive and irreversible, and the development of artificial intelligence has a profound impact on education [8,18]. Intelligent technology to promote education reform has become an important consideration in the strategic layout of countries, and one of the important manifestations in higher education is the digital transformation of higher education. Digital transformation has become the trend of The Times. The digital transformation of education is the response to the development of the digital age, the inevitable choice to realize the modernization of education, and an important way to achieve fair and quality education [17]. All countries are paying attention to the digital transformation of higher education, and solving the problems in the digital transformation of higher education is the focus of high-quality development of higher education in the process of educational reform.

Digital transformation in higher education is being used to improve student experience, accessibility, provide quality teaching materials, and provide them with a means of blended learning [12]. More and more universities are incorporating digital transformation into their development strategies, and the construction of virtual learning plat-

forms enables universities to meet the needs of transnational students, becoming an important opportunity for universities to gain a strategic position in the global education industry [5]. At the same time, students are becoming more dependent on digital tools and means in the learning process. In particular, the digital transformation of higher education has accelerated globally during COVID-19 [3]. The widespread globalization of education has fundamentally affected universities in teaching, delivery, assessment and continuous improvement mechanisms. In the era of artificial intelligence, students are facing more challenges that traditional learning models cannot solve, and the crisis of students' subjectivity is an obvious manifestation.

Students are an important subject in the process of education, and the study of students' subject is a return to the essence of education, and subjectivity is also a fundamental issue that education needs to explore. The sweeping educational changes in the digital age are no longer confined to superficial innovations in teaching and learning methods based on deep learning, cross-border integration, man-machine collaboration, machine learning and other technologies, but have begun to penetrate and spread to the change of subject identity in education [1]. Therefore, it is necessary to re-examine the "subjectivity" of students under the background of digital transformation of higher education, analyze the dilemma of the crisis of students' subjectivity, and provide countermeasures and suggestions for the reconstruction of students' subjectivity, so as to promote the deep integration of digital transformation and students' subjectivity development.

## 2. The Interpretation of Students' Subjectivity

### *2.1. The Connotation and Historical Development of Students' Subjectivity*

In modern western philosophical schools, the focus on students' subjectivity in educational activities can be traced back to Rousseau's Emile. Rousseau proposed that natural education should cultivate the cognition of truth, kindness and beauty and the intellectual and health ability of love among the educated, so that they can have the imagination, creativity and sense of meaning of life as human beings [7], which fully reflects the respect for students' subject and the personalized training of students in the education process. In the late 19th century, Dewey proposed the "new three centers" theory [9] on the basis of progressive educational theory and pragmatic educational thought. Students' subjectivity was emphasized, and students changed from the role of passive receiver to the active one with development needs. This means that the existence of students as a subject consciousness and subject needs has been discovered and recognized. In the early 20th century, the Swiss psychologist Piaget put forward the theory of epistemological generation, pointing out that students have plasticity and constantly develop in the interaction with the environment [2]. Students acquire new knowledge through independent construction in the process of practice, which emphasizes the independent development of students. In the 1940s, humanistic psychologist Rogers proposed the student-centered non-directive teaching theory [14]. He pointed out that the teaching process should reduce the direct and directive guidance, pay attention to the cultivation of students' initiative, and affirmed the subject status of students in the learning process. We can know that the discussion of "student subjectivity" is aimed at determining who should be "centered" in the educational process.

It can be seen that the connotation of students' subjectivity is constantly improving and enriching, and keeps pace with the development of The Times. Throughout the domestic and foreign research on "student subjectivity", the core of the discussion of student subjectivity is not to determine the subject status of students in educational activities, but to pay attention to the play of the subject role of students in the process of learning and growth, so as to achieve the shaping of personality, ability training and comprehensive development.

### *2.2. A New Interpretation of Students' Subjectivity in the Era of Artificial Intelligence*

Under the background of digital reform of higher education, some scholars have new thinking about students' subjectivity from the perspectives of educational technology value, human alienation, digital technology and student relationship [4,6]. At present, scholars focus their research on the relationship between student subjects and educational technology. It is worth noting that the digital transformation of higher education is not only reflected in the penetration of digital technology in the field of education, but also in the reform of the education system. The American Association for Higher Education Information Technology defines digital transformation of higher education as "a systematic and overall educational innovation process that optimizes and transforms the operating model, strategic direction and value proposition of colleges and universities through cultural transformation, workforce transformation and technology transformation." The relationship between people and educational technology has become the research focus of many scholars [19]. Oliveira and De Souza point out that The era of Education 4.0 is driven by digital transformation, "The digital transformation of teaching processes is guided and guided supported by the use of technological, human, organizational and pedagogical drivers in a holistic way. " [13]. It can be seen that the digital transformation of higher education is not only at the technical level, but also involves different levels such as society, economy and culture. Therefore, when we talk about student subjectivity in the context of digital transformation of higher education, we should see the impact of systemic change on student subjectivity.

Based on the understanding of students' subjectivity, this paper holds that under the background of digital transformation of higher education, students' subjectivity may be greatly affected in the following aspects. First, students' autonomy mainly includes students' mental health and students' self-cognition and control ability. Students' mental health is the basis of students' normal participation in learning activities, and students' self-cognition and self-control ability are important manifestations of their autonomy. Second, students' initiative is mainly manifested as the ability to explore and think outwards and the enthusiasm to participate in teaching activities. Third, students' creativity is reflected in self-growth and transcendence internally, interaction with external environment externally and adaptability to society.

## 3. Report Interpretation: The Crisis of Students' Subjectivity

In May 2023, EDUCAUSE, a higher education information technology institution in the United States, released the "2023 Horizon Report" in May 2023, with two versions of "teaching and learning edition" and "overall student experience edition" and two versions of "data governance" and "generative AI" action plans. The 2023 Horizon Report/Overall Student Experience Edition (hereinafter referred to as the Overall Student Experience Edition Report) is the first EDUCAUSE report focusing on the student body in the past three years, reflecting EDUCAUSE's focus on higher education digitization from the application level of information, digital technology and artificial intelligence to the effect level. Based on the experience of the report and the understanding of the concept of digital transformation of higher education, this paper interprets the crisis of student subjectivity from the perspective of student autonomy, initiative and creativity.

### *3.1. Student Autonomy Crisis*

#### 3.1.1. Mental Health Problems are Common

Mental health challenges affect people around the world, with consistently high rates of stress, depression, anxiety and suicidal thoughts among students. Mental health can affect all aspects of the student experience, including enrolment and retention, learning and grades, and participation in classroom and extra-curricular activities. It also affects social relationships, including those with peers, teachers and staff. While many students are facing mental health challenges now more than ever, they are also willing to seek help,

and the demand for mental health services at colleges and universities is increasing substantially, putting pressure on institutions. In the context of the digital transformation of higher education, there are new and amplified concerns about the overall well-being of students, and despite efforts by mental health professionals to harness generative AI to provide individuals with digital companions, the overall well-being of students has continued to decline over the past decade. It is important to note that mental health is also an issue of equity and that all students should have equal access to holistic health support, and understanding the needs of different groups of students can be challenging.

#### 3.1.2. Virtualization of Self-Knowledge and Control

The application of artificial intelligence technology in the field of learning is forming a new learning feedback mechanism. Machine learning, a branch of artificial intelligence that uses data and algorithms to identify patterns and mimic human learning, is being used more frequently to analyze student data, accelerating the potential for analytics to have an impact on student learning, outcomes and success. Machine learning can analyze student performance and learning gaps between students. These analyses have a significant impact on student achievement, and educators, institutions, and parents can use the results of machine learning analysis to intervene early, identify struggling students, and provide targeted support to reduce dropout rates and better support marginalized students. However, in some cases, its use may lead to the dissolution of student autonomy. The over-reliance on automation means that machine learning replaces human thinking and introspection, and the disadvantages of intelligent technology to automatically diagnose problems and provide solutions according to the actual situation result in the construction of students' subjective cognition. Furthermore, human "autonomy" power is lost in the "self-determination" of technology. Students' self-cognition becomes the cognitive image given by "data", and students lose the opportunity to have a deep self-dialogue. This ends up making learning feel less personal, even less human, and even invisibly depriving students of control over themselves. When big data uses standardized planar data to build a "digital portrait" of college students, it also means that the integrity of the student body is deconstructed by the data.

### *3.2. Student Agency Crisis*

#### 3.2.1. The "Information Cocoon" Fetters and Replaces Thinking

With the iterative development of digital technology, AI technology is becoming easier to use, while the complexity of the technology itself continues to increase. The use of artificial intelligence technology in the field of education can help teachers simplify the generation of curriculum materials and reduce teachers' work pressure. The information sharing of big data supported by artificial intelligence makes the dissemination of knowledge break through the limitations of time and space. With the increasing dependence on artificial intelligence, students' subjectivity gradually gives way to intelligent technology. On the one hand, students are more likely to fall into the "information cocoon", and the self-controlled orientation makes intelligent technology push information according to the hot spots of students' attention [10], thus lacking a diversified and inclusive perspective. On the other hand, students' ability to think independently has been weakened, and seeking "answers" through artificial intelligence has become students' subconscious behavior in facing problems. Students' ability to think independently and create is being eroded by artificial intelligence. The weakening of thinking ability, rigidity and homogenization of thinking are the performance of students' main body giving in to intelligent technology, which is more directly visible. Behaviors such as plagiarism and plagiarism have become more common. At the same time, the complexity of intelligent technology makes it more difficult to monitor the teaching process and evaluate the teaching results.

#### 3.2.2. Social Distortion and Emotional Loss in the Learning Field

The change of communication mode between learners and between teachers and students results in the distortion of social interaction in learning field. With the development of digital technology, many new learning modes emerge as The Times require. Online courses and blended courses provide learners with more flexible and diversified learning modes, which are chosen by more and more people. As classroom models shift from offline to online, students who take online or hybrid courses find it harder to engage and make meaningful connections. What's more, artificial intelligence machines are replacing the original student-student interaction and teacher-student interaction, and human-computer interaction has gradually become the mainstream. From the results of human-computer interaction, although intelligent media constantly imitate and reproduce the natural feedback of human emotions by virtue of its powerful simulation technology in the process of human-computer interaction, it ultimately belongs to the "general law" of data summary [15,16]. The quality of virtual social background and human-computer interaction experience is not necessarily better than the traditional interaction mode that does not involve artificial intelligence. For example, learning feedback obtained through interaction with teachers and classmates, rather than automatic feedback generated by algorithms, can better guide students to self-reflection and self-recognition, and get suitable solutions for "what should I do better". Habermas' communicative behavior theory also points out that the relationship between people and society needs to be realized by communication. Compared with face-to-face contact and emotional interaction in the real environment, network socializing lacks practical links, which easily leads to the lack of emotion and affects students' subjective initiative and creativity.

### *3.3. Student Creative Crisis*

#### 3.3.1. Immaturity of Digital Governance is Detrimental to Student Development and Social Equity

The collection and application of student data by higher education institutions is constantly expanding. During the pandemic, with the rapid adoption of online and blended learning models and educational technologies, the amount of data collected on students has also increased significantly, and policymakers have become more focused on using data to make decisions. However, as more data is collected and digital boundaries expand, students' privacy is under increasing threat. While colleges and universities are facing more data breaches, security, privacy, and ethics issues, the risks AI tools face extend far beyond data privacy and security, even to differences in digital access. Because digital technology tools such as artificial intelligence are trained on data generated by current social, cultural, and economic systems, they can and do amplify the inequalities and biases inherent in those systems. The digital divide, for example, is likely to continue to widen, meaning that underserved and lagging students will suffer the most. With the continuous advancement of the digital transformation of higher education, digital technology and its application scenarios have become an important part of supporting the operation of the education system. Teachers, staff, and students all need training and professional development to use AI tools safely and effectively. Data governance systems will need to be updated, AI tools will need to be integrated into organizational data ecosystems, and groups disadvantaged by regional economic and technological access gaps will be the main groups marginalized. Whether it is data security and privacy issues, or potential social equity risks, it will have an impact on students' subjectivity.

#### 3.3.2. Changes in the Labor Market Lead to Inadequate Self-Worth and Alienation of Educational Purposes

The unchecked growth of AI technology is proliferating in all areas of global life, and the use of AI is expected to become the primary skill of the 21st century workforce. While higher educators and researchers are debating whether and how AI should be used in

institutions, employers seem to be calling for all types of AI to be integrated into their current processes and products. Ai has more potential than any other modern technology to introduce massive disruption to the labor market, especially for jobs that require a lot of technical skills and expertise. The impact of artificial intelligence technology on the labor market has widely spread to school education, which is a challenge to the purpose and mission of education. Universities and colleges, for their part, have taken on a paradigm-shifting task: training the current and upcoming workforce to develop and use AI. This is reflected in the increase in the number of students entering majors such as computer and data science, and as AI takes on more coding work, projects with no coding experience or less coding output are gaining favor. The labor market in the context of digital transformation is placing new demands on students, and future students will place greater emphasis on return on investment. With the decline of the return on investment under the traditional teaching mode of higher education, students' identification with majors and university education will also decline, and their inability to adapt to the development of The Times will lead to the loss of self-identity and self-value. This is undoubtedly contrary to the principle pointed out by Dewey that "the educational process itself is its purpose".

## 4. Report Reflection: Reconstruction of Students' Subjectivity

### *4.1. Facing up to the Use of Digital Tools to Return to Education Itself as the Ultimate Goal*

In the face of the potential risks of AI tools and machine learning, it is most important to face up to the significance of educational technology and digital tools in educational practice. With the widespread adoption of digital technologies in education, we must recognize the pedagogical, social and cultural context in which digital transformation in higher education exists. Digital tools alone do not solve any problems, but when they are implemented with the right expertise and as part of a larger strategic effort, they can help students develop purposeful and meaningful connections. Technology should promote students' development rather than hinder their personal development. Faculty and staff should not be fooled by the "digital native" myth, either. Therefore, the digital transformation of higher education has put forward higher requirements for the education system. On the one hand, educators are no longer teaching traditional knowledge, but teaching students higher-order skills such as complex synthesis, analysis, interpretation, prediction, and even creativity. For example, redesigning curriculum and assessment standards, adopting a variety of methods to detect the inappropriate use of digital tools in students' learning processes, resisting unoriginal work to reduce plagiarism, and fostering creativity and critical thinking. On the other hand, students themselves should also develop a focus on creativity and critical thinking, with vigilance, prudence, and reverence for digital tools. For example, actively participate in discussions about the different degrees of human thinking and artificial intelligence, and have a more diverse understanding of self-worth and self-possibility, so as to get rid of reliance on digital tools and blind trust.

In terms of evaluating people with data and dealing with the potential risks of artificial intelligence tools and machine learning, we should pursue a more complete and three-dimensional analysis model. Nor can the definition of "data" be limited to structured information that can be quantified at scale. Higher educators can use learning analytics to achieve a more comprehensive understanding of the student experience, and should not be limited to a single model composed of evaluation data. A unified data model brings together disparate data from across the organization so that end users can conduct more robust analysis. For example, data on students' academic engagement can be combined with data on their extracurricular activities, or even self-reported, such as surveys and course assessments. Data insights can be used for a wide range of institutional activities, from strategic planning to student advice. Analytical tools can also provide advice to faculty and staff, such as teaching methods and student resources. To maximize the benefits of learning analytics and minimize unintended harm, stakeholders must properly manage

unified data systems. Given the current state of data governance in most organizations, this will require significant resources. At a time when resources are already fragmented, it will be challenging for organizations to devote sufficient resources to redesigning data governance. The biggest hurdles are creating data privacy policies that protect individual students and addresses concerned with tracking and surveillance, supporting data security to protect organizations from data breaches, designing and monitoring data analytics practices so they don't perpetuate harmful biases and exacerbate existing inequalities, and training end users to use data insights more appropriately.

### *4.2. Cultivate Students' Technical Connection and Sense of Belonging to Promote the Positive Interaction between People and Technology*

Universities and colleges are banking on digital technology as a way for students to connect with each other and with faculty and staff. Educational technology and digital tools should promote the connection between students and between teachers and students. On the basis of breaking the barriers of time and space, cultivating users' sense of belonging to technology can reduce users' resistance to digital tools and better make digital tools serve people. For example, online communication platforms are meant to facilitate meaningful interactions rather than reduce the opportunities for face-to-face interactions. Apps where remote workers come together can be used to help students communicate about coursework, club activities, support services like advice, and more. In these cases, faculty members not only help students make connections, but also teach them to use the tools they might need in the workplace. Social media applications can be used for ongoing student engagement in real time, both for academic and extracurricular activities and to communicate with students about activities and resources. Students are already spending time on social media and using a variety of tools to connect with each other. At the same time, it is equally important to ensure that the real social scene still exists, and virtual social networking cannot replace real social networking, but can only become an auxiliary means of traditional social networking.

Digital sharing plays an integral role in leveraging technology to support students' connection and sense of belonging. Without equitable access to digital tools and resources across institutions, some students will miss out on the benefits of digital solutions, perpetuating systemic bias and inequality. However, digital sharing is not only characterized by access to basic hardware, software, and the Internet. Technologies that support student connection and belonging must also be designed with accessibility, affordability, privacy, and security as fundamental principles. When built on accessibility and ease of access, these technologies can even support personalized learning and communication for special students.

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### *4.3. Improve the Digital Literacy and Ability of All Subjects to Adapt to the Development of The Times*

Data literacy and digital ability in the age of digital intelligence are the prerequisite for all subjects in the education system to better use digital technology. When students, faculty, staff, and administrators are able to analyze and interpret data, they all have the

ability to identify aspects of the student experience that need more attention. This democratization of data insight reduces the influence of personal biases and non-objective perceptions. However, relying too much on data results and data analysis models will make education lose its "humanization" and ignore the "silent minority" in the education process. Promote digital literacy and digital competence across all actors in the education system, including not only students, but also teachers and relevant administrators [11]. Data literacy training should include guidance on inclusive analytics practices, such as data decomposition and qualitative data analysis, and how to better use data becomes a question for educators and managers to ponder. The accompanying curriculum and assessment design needs to be revisited, with a primary focus on evidence-based recommendations and practices regarding accessibility, and which learning design and assessment strategies work well in online or mixed versus live Settings. In addition, in the training system of higher education, there is a need to further cover the relevant content of social digital transformation, so that more students have a broader understanding of education, technology, health, politics, socio-economic and issues related to climate and sustainability under the digital transformation of society, so that they can make sound judgments about their career development.

To further adapt to the development of The Times and market changes, students should also consciously cultivate their own digital literacy and digital ability, and empower their own development with digital technology and digital tools. Students need data literacy to become agents of their own education, careers, and lives. In particular, when considering a student's overall experience in higher education, institutions' data processes should not only be transparent to students, but should also include student voices. Furthermore, insights into data should not be reserved for faculty members. Students should be empowered to use data insights to understand and make decisions about their own education. In addition to institutional Settings, data literacy will help students think critically and enable them to judge the accuracy of information they receive from any source.

## 5. Conclusion and Future Research

This study deeply focuses on the reconstruction of students' "subjectivity" in the context of digital transformation of higher education in the era of artificial intelligence. Through in-depth interpretation of the connotation of students' subjectivity and analysis of relevant reports, it accurately reveals the multiple crises faced by students' subjectivity, and then puts forward targeted reconstruction strategies.

It is undeniable that although the digital transformation of higher education brings many opportunities, such as the convenient access to learning resources and the diversified expansion of learning methods, it also causes a series of crises of students' subjectivity. In terms of autonomy, mental health problems are frequent, students face greater psychological pressure, anxiety, depression and other emotional problems are prominent, which not only interfere with the learning process, but also weaken their social ability; At the same time, over-reliance on machine learning technology makes students' self-cognition and ability to independently control the learning process hollow, lack of deep introspection and independent thinking, and their independent consciousness gradually weak. On the initiative level, the phenomenon of "information cocoon" leads to one-sided information acquisition and limited thinking. Over-reliance on artificial intelligence to seek answers inhibits independent thinking and innovation, leading to convergence of thinking and common plagiarism; In the online learning mode, the quality of social interaction decreases, emotional communication is lacking, and human-computer interaction is difficult to replace the emotional depth and self-cognitive guidance in the traditional interaction mode, and the initiative is hindered. In the creative dimension, the digital governance system is not perfect, data privacy and security issues are serious, and data leakage risks

threaten students' rights and interests; The uneven application of digital technology aggravates the unfairness of education, and the digital divide makes some students at a disadvantage; The reform of labor market causes students to question the value of majors and education, lack of self-worth and alienation of educational purpose.

In view of the above crisis, the reconstruction of students' subjectivity needs multidimensional measures. First, the rational use of digital tools is guided by the return to the essence of education. Educators should innovate the teaching paradigm, pay attention to the cultivation of high-level abilities, scientifically use digital tools to monitor learning, prevent academic misconduct, guide students to correctly understand the auxiliary role of digital tools, and avoid over-dependence. Students should actively develop critical thinking, engage in relevant discussions, gain a deep understanding of self-worth and potential, and free themselves from the excessive constraints of digital tools. Second, focus on cultivating students' sense of technological connection and belonging, and promote the harmonious coexistence of man-machine. Universities should use digital technology to build multiple communication platforms, promote interaction, and balance online and offline social interaction. Digital shared resources should follow the principles of equity, accessibility and security, facilitate personalized learning, focus on special student needs, and enhance students' sense of identity with technology. Third, improve the digital literacy and ability of all subjects in the education system, in line with the development pulse of The Times. Data literacy training should cover multiple analytical methods to help educators and managers use data scientifically; Optimize the curriculum design and evaluation system, integrate the knowledge of digital transformation, broaden students' horizons, and improve their career planning ability.

There are also limitations to this study. In terms of research methods, it mainly focuses on theoretical analysis and report interpretation, with insufficient empirical research and lack of large-scale cross-regional and multi-level college student sample data support, and the generalisability of conclusions is limited. For example, the complex role of social and cultural factors in the reconstruction of students' subjectivity has not been fully clarified.

Looking forward to the follow-up research, on the one hand, empirical research should be strengthened, a wide range of cross-regional and multi-level university field investigations and experiments should be carried out to obtain detailed and solid data, and the actual situation, influencing factors and internal mechanism of students' subjectivity reconstruction should be deeply explored, so as to further test and improve the existing theory and strategy system. On the other hand, deepen the research on the comprehensive influence of multiple factors, focus on strengthening the analysis of cultural, social psychological and other factors, build a more complete theoretical framework, and lay a solid theoretical foundation for accurately resolving the crisis of students' subjectivity. In addition, it closely tracks the dynamics of education policies and the trend of digital technology innovation, continuously evaluates the implementation effect of restructuring strategies, and dynamically optimizes the content of strategies, so as to provide more forward-looking, scientific and practical decision-making basis and action guide for effectively guaranteeing and promoting the development of students' subjectivity in the digital transformation of higher education.

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