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THE IMPACT OF EDUCATION DIGITIZATION ON THE RIGHT TO EDUCATION AND ITS RESPONSE

Abstract: *In the current digital era of rapid development, education digitalization has become an inevitable trend, and its promotion and application have subverted the traditional teaching model and education system. This transformation brings with it a host of opportunities as well as challenges. The right to education is a complex right with the dual characteristics of social right and free right, and education digitization has caused a strong impact on it. In order to achieve the goal of education and realize the protection of the right to education, the state not only needs to start from the whole, people-oriented to promote the transformation of education digitization; It is also necessary to fulfill its obligations, establish a national responsibility system with digital empowerment as the core, rebuild the guarantee mechanism of the right to education, and find a dynamic balance between the process of education digitalization and the protection of the right to education.*

Keywords: *Education digitization, extraterritorial protection of the right to education, digital skills, national obligations*

I. Problem Presentation

With the deepening of the global scientific and technological revolution and industrial revolution, digitalization and informatization have not only changed our way of work and life, but also profoundly affected the field of education. Education is the foundation of national development, and its quality and popularity are directly related to the future and competitiveness of a country. At present, education digitalization has been widely recognized by the international community as an important force to promote the development of education. The United Nations Summit on Education Change defined it as one of five key areas for action, and many countries around the world have incorporated it into their national digital strategies, putting education at the heart of their national digital strategies.[1] The implementation of digital education has brought many positive changes, such as the expansion of educational resources, the diversification of teaching methods and the provision of personalized learning, which have greatly improved the coverage and quality of education. However, this transformation is also accompanied by a series of challenges, especially the unprecedented impact on the traditional education system, teaching model and learning paradigm. Traditional face-to-face teaching and centralized classroom teaching are gradually being replaced by distance learning, online courses and virtual interaction. This change not only changes the way of teaching and learning, but also puts forward new requirements for the quality and equity of education.[2] The promotion of digital education involves not only the application of technology, but also the comprehensive integration and innovation of educational concepts, policies, teachers' ability and infrastructure. Achieving this goal will require the collaboration of education policy makers, technology providers and all sectors of society to build a supportive environment to overcome existing challenges, ensure education quality and achieve true educational equity. Education digitalization is the deep integration of educational elements and information technology. Through the use of digital tools, the overall quality of education can be improved. In the era of rapid development of science and technology, education digitalization has become an inevitable trend, which is full of opportunities and challenges.

The impact and response to education digitization is a multi-dimensional, cross-field and complex issue,

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[1] United Nations. UN Summit on Education for Change: A global push for action on education. https://www.un.org/zh/transforming-education-summit

[2] See Xianghe Gong, "The Systematization, Equity and Quality of the Development of the Right to Education in China", *Human Rights*, Vol.5, 2021, pp.22-27.

which involves not only the upgrading of technology and facilities, but also the formulation of policies, the renewal of educational concepts and the maintenance of social equity. The right to education is still the center and focus of the right context under the background of education digitization, and its effective protection is the basic criterion to evaluate whether the achievements of education digitization meet the standards. Generally speaking, the right to education has both the attributes of social rights and the characteristics of freedom rights. Therefore, the impact of education digitization on the right to education can be analyzed from two aspects: social rights and freedom rights. This paper will use the perspective of system theory to demonstrate the challenges and problems suffered by the right to education in different aspects, and discuss the corresponding countermeasures and ideas, in order to achieve the strategic goal of education digitization, so as to promote the high-quality development of education.

II. The impact of education digitalization on the right to education

The right to education is a compound right with the attributes of social right and freedom right.[3] As early as 1919, the right to education was incorporated into the Weimar Constitution as a fundamental right.[4] From the Weimar Constitution, the right to education rose to the basic right with a strong social right color. Influenced by this clause, the right to education is also positioned as a social right in constitutions of many countries in the world. However, the realization of social rights cannot be separated from the protection of freedom rights. The core of the social right is the requirement that the state provide its citizens with specific educational services and guarantees, and this requirement is based on the freedom enjoyed by the individual. In short, the right to education contains the dimension of social rights, and cannot be separated from the basis of freedom. This paper will interpret the impact of educational digitization on the right to education from the perspective of social rights and freedom rights.

(I) The impact of educational digitization on the right to education as a social right

As an important part of social rights, the right to education includes, but is not limited to, the right to free compulsory education and the equality of educational opportunities.[5] In the context of its attribute as a social right, the right to education emphasizes the equality of educational opportunities.[6] Equality in education means equality in educational content, opportunities and conditions, and explicitly prohibits any form of discrimination.[7] With the continuous advancement of digital education, education digitalization has brought a wider range of rights to the educated. However, at the same time, the emergence of "digital divide" has become a major problem in the allocation of educational resources, and the issue of equality and fairness has become one of the most serious challenges in the process of education digitalization. This challenge focuses on the right to education and is manifested in the following aspects:

1. Limited access to devices and imbalanced education.

With the rapid development of education digitization, a series of new education equality problems have gradually emerged, the most significant of which is the imbalance of education equity caused by limited access to devices. The so-called "digital divide" refers to the differences in the access and use of information and communication technology among individuals in different regions and different economic conditions. Its essence is that the inequality of Internet use leads to the difference in the level of information, and then produces the phenomenon of information inequality.[8] The digital divide reflects the gap in the degree of possession of information technology tools. The first digital divide at the level of digital access is called "access gap". This difference directly affects the realization of the right to education, especially in the two core contents of free compulsory education and equal educational opportunities.

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3 See Jun Wang, Huimin Qin, "Balancing the Right of Freedom and Social Rights: the Legal Logic of the Extraterritorial Protection of the Right to Education", *Education Research*, vol.10, 2022, p.152.

4 Article 145 of the Weimar Constitution states: "Primary education is a public obligation. The duration of schooling is at least eight years, and elementary school and completion of school classes and educational supplies are completely free."

5 The scope of "free" varies from country to country. Some countries just exempt tuition; Some countries not only exempt tuition fees, but also exempt all fees for compulsory education such as textbook fees and miscellaneous fees. The original "Compulsory Education Law" of our country stipulates that tuition fees are exempted, and the revised "Compulsory Education Law" stipulates that tuition fees and miscellaneous fees are exempted, and other fees such as textbook fees are not exempted. As we all know, the provisions of our country "Compulsory Education Law" have not been truly implemented, in fact, even the tuition fees of compulsory education have not been exempted. It was not until 2007 that tuition and miscellaneous fees were truly exempted from compulsory education in rural areas of our country.

6 See Bufeng Zhang, "The Right to Education with the Dual Natures of Social Rights and Freedom", *Journal of Beijing Administrative College*, vol.5, 2009, pp.80-81.

7 See Suping Shen, *The Right to Education Theory and Case Studies*, Beijing: Educational Science Publishing House, 2022, p.20.

8 See Jianbin Jin, "A Conceptual Analysis of the Digital Divide", *Journalism & Communication*, vol.1, 2003, pp.75-79.

In many developing countries, especially in rural and remote areas, students are often unable to afford computers or smart devices and Internet services due to family economic constraints, resulting in their inability to access digital learning platforms smoothly. Even in some developed countries, children from low-income families may face similar problems. For example, 15 to 16 million children in the United States do not have access to the Internet, which is about 25 percent of all students in the country.[9] This unequal access to devices directly leads to the uneven distribution of educational resources and exacerbates social educational inequality. On the other hand, the equality of education not only includes the equality of educational content and opportunities, but also emphasizes the equality of educational conditions. In the digital education environment, it is particularly important of the equality of educational conditions, because it is directly related to whether students can effectively use digital resources for learning. For example, due to poor infrastructure, insufficient network coverage or slow network speed in some regions, students are unable to smoothly access online educational resources, participate in online classes or use digital teaching tools, which undoubtedly aggravate the inequality of educational opportunities.[10] Moreover, even when equipment and network infrastructure are addressed, the quality and adaptability of educational content are important factors affecting educational equality. In the development and application of digital educational resources, the specific needs of students from different regions and cultural backgrounds are often ignored. "One-size-fits-all" resources often do not meet the learning needs of all students, especially those from ethnic minorities or those with special educational needs.

It is clear that digital technology has become a key driver of educational development in contemporary society, bringing unprecedented opportunities and possibilities for learning. However, the digital divide remains a wide and intractable problem. Especially in many rural and economically weak areas, students are often unable to experience the convenience of education digitalization. The COVID-19 epidemic has exacerbated these educational inequity, revealing gaps in students' access to online services, electronic devices and trained teachers. The disparity in the ability of teachers to use digital technology also exacerbates the imbalance in educational resources.

2. Widened skills gap and intensified education stratification.

With the widespread promotion of education digitization, a significant phenomenon is the widening of the skills gap and the intensification of education stratification. This trend not only reflects the uneven use of information technology in education, but also highlights deep inequalities within the education system and at the socio-economic level. In other words, with the gradual popularization of electronic devices and the Internet, the digital divide has shifted from "whether to obtain information technology tools" to "whether to have the skills and degree of skills to use technology and tools", which is the so-called "skills gap".[11] The skills gap mainly refers to differences in digital skills and information literacy. In the background of digital education, such differences not only affect students' learning outcomes, but also affect their future employment and social competitiveness.[12] Learners not only need skills in how to use digital tools and resources effectively to support learning and problem solving; They also need to have the ability to evaluate information, understand and critically analyze its content.[13] However, in the actual educational process, the cultivation of these skills is often closely related to the students' family background, school resources and the level of regional development.

The phenomenon of education stratification is particularly obvious in the digital education environment. There are significant differences in the quality of education and educational opportunities that students receive due to differences in economic conditions, geographical location, and social resources. In some developed regions, schools may have advanced teaching equipment and abundant educational resources, which can provide high-quality digital educational experience and cultivate students' information processing ability and innovative thinking. In contrast, schools in poor or remote areas have limited resources to provide the same level of education services, which directly affects students' learning effectiveness and future development.[14] In

9 See „K-12 Student Digital Divide Much Larger Than Previously Estimated and Affects Teachers, Too, New Analysis Shows", https://www.prnewswire.com/news-releases/k12-student-digital-divide-much-larger-than-previously-estimated-and-affects-teachers-too-new-analysis-shows-301084856.html.

10 See Wei Gao; Xinyu Li; Yudan He; Na Xu: Goals, "Challenges and Action Plans for a New Educational Social Contract from the Perspective of Technology", *E-education Research*, Vol.11, 2022, p.124.

11 See ATTEWLL P, „The first and second digital divides", Sociology of education, Vol.74, 2001, pp.252-259.

12 See VAN DIJK J A G M, The Evolution of the Digital Divide: *The Digital Divide Turns to Inequality of Skills and Usage*, Digital Enlightenment Yearbook, Amsterdam: IOS Press, 2012, pp.57-75 .

13 See the ITU Development Sector website, Digital Skills Assessment Guide, https://academy.itu.int/sites/default/files/media2/file/D-PHCB-CAP_BLD.04-2020-PDF-C_correct.pdf.

14 See Nan Zhao; Shikun Chen, "Digital Divide, Educational Human Capital, and Labor Income", *Population Journal*, Vol.4, 2023, p.71.

addition, skills gap and education stratification are also closely related to educational equity. Inequality in skills will largely lead to inequality in social opportunities, and this inequality may further expand along the educational stratification, forming a vicious circle of wealth gap. Therefore, the education system needs to focus not only on the transfer of knowledge, but also on the development of skills, which are crucial for individual adaptability and overall competitiveness, especially in a rapidly changing digital society. The skills gap also exacerbates the unequal distribution of educational resources. In the process of education digitalization, high-quality online education resources often require certain search skills and critical thinking skills to be effectively utilized. If students lack these skills, they will not be able to benefit from abundant online resources, which directly affects their learning outcomes and educational opportunities.[15] In addition, skills gap and education stratification are also closely related to educational equity. Inequality in skills will largely lead to inequality in social opportunities, and this inequality may further expand along the educational stratification, forming a vicious circle of wealth gap. Therefore, the education system needs to focus not only on the transfer of knowledge, but also on the development of skills, which are crucial for individual adaptability and overall competitiveness, especially in a rapidly changing digital society.

(II) The impact of educational digitization on the right to education as a social right

The right of freedom is the basic right type opposite to the social right. Social rights are premised on the right of freedom, and social rights are those that absorb the right of freedom. The starting point and end point of any fundamental right is the individual, not the state or any other organization. The right to freedom is the basis of the right to education, and the right holder of the right to education requires the state not to violate and respect his right to education. As a kind of freedom, the core of the right to education lies in the protection of the freedom of education and the protection of the independent choice and personal development of the educated. From a positive point of view, the digitization of education expands the space for individual free choice. Students can choose suitable online courses and learning resources according to their personal interests and learning pace, so as to better realize personalized learning. From a more macro and development perspective, education digitization has also caused a certain impact on the freedom attribute of the right to education, mainly reflected in the following aspects.

1. Education standardization is increasing, and students' personality development is limited.

With the widespread use of digital technologies, the field of education has undergone a remarkable transformation. Education standardization is mainly reflected in the unification of teaching content, assessment methods and learning resources. Digital education platforms generally adopt standardized curricula and tests to achieve consistency and manageability of educational content. Most online learning systems, for example, provide a uniform syllabus and assessment criteria, with the main goal of ensuring that students receive the same quality of education no matter where they are located.[16] However, this approach ignores regional and cultural differences as well as individual differences, making the educational content often not fully adapted to the specific situation of each student. This education standardization is also reflected in the standardization of teachers' teaching methods. Digital tools and teaching platforms often require teachers to follow specific teaching processes and use standardized teaching resources, which limits the ability of teachers to adapt teaching strategies to the personality and needs of students. Therefore, teachers' creativity and personalized teaching methods in the teaching process are suppressed.

Under the influence of education standardization, on the one hand, students will have excessive dependence on digital devices and network content. Especially after relying on them to complete learning tasks and achieve good results for many times, students have greater sense of dependence. With the proliferation of information and digital devices, students are vulnerable to all kinds of distractions when studying. The attractive elements in the digital learning environment tend to distract students, and long-term distraction can lead to the formation of shallow learning habits, that is, the tendency to quickly browse information rather than thinking deeply. This not only affects their learning efficiency, but may also impair their deep understanding and long-term memory of what they learn.[17] At the same time, the use of educational

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15 See Lele Hu, "On the Opportunities and Challenges Brought by "Internet +" to China's Education", *Modern Educational Technology*, Vol.12, 2015, p13.

16 Xiaoyong Hu; Ting Xu; Yuxing Cao and Huanyun Xu, "Research on the Theory of Informatization Promoting Basic Education Equity in the New Era: Connotation, Path and Strategy", *E-education Research*, Vol.9, 2020, pp.45-46.

17 See Rosen LD; Lim AF; Felt J; ... & Rokkum J, "Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits", Computers in Human Behavior, Vol.35, 2014, pp.364-375.

technology may also cause students to over-rely on specific learning tools and methods and lack innovation and critical thinking skills. When the learning process relies heavily on preset digital tools and resources, students lose interest in actively exploring knowledge and solving problems, which is not conducive to cultivating their creativity and independent thinking ability.[18] On the other hand, in the standardized education system, the individual needs of students are often difficult to be fully met. There is a limited ability of the education system to respond to individual differences when all students have to adapt to the same learning materials and assessment standards. This pursuit of consistency may lead to education ignoring students' personality traits and interests, thereby inhibiting students' opportunities to explore themselves and develop their personal potential. For example, standardized testing and assessment methods tend to evaluate student performance in certain predetermined disciplines, while ignoring the development of non-standardized skills such as creativity, critical thinking, and social skills. This kind of education model, which emphasizes knowledge memory and repeated practice, is not conducive to cultivating students' comprehensive ability and individual interest. In terms of technology use, although digital education tools such as learning management systems (LMS) and artificial intelligence education applications provide data-driven learning analytics, the design of these tools is often based on standardized learning pathways and outcomes. This means that the unique needs of students in the learning process and individualized learning pathways may be overlooked in favor of an emphasis on efficiency and standardized outputs.

2. Privacy challenged by the invasion of digital technology.

The issue of privacy and security of educational data has become a new challenge in the process of education digitization and the use of educational big data.[19] In the digital era, with the rapid development and wide application of technology, the invasion of digital technology and its challenge to privacy has become a global concern. Education is no exception. With the proliferation of digital education tools and platforms, students, teachers, and educational institutions face unprecedented risks to their personal information security and privacy. In the context of education digitization, the invasion of digital technology is mainly manifested as the extensive collection and processing of personal data. Educational technology companies and institutions use learning management systems, online course platforms, and other educational applications to collect large amounts of personal information about students, including but not limited to name, age, contact information, academic performance, behavior patterns, and interaction records. This data is used to analyze student learning habits, predict learning outcomes, personalize educational content, and even, in some cases, is employed for commercial purposes.

This extensive data collection activity raises concerns about privacy violations, especially when it involves sensitive information such as geolocation, biometric data, etc. Moreover, security loopholes in the storage, processing and transmission of data may also lead to the disclosure, abuse or loss of personal information, which poses a serious threat to the privacy of individuals. On the one hand, the large-scale collection and analysis of data will violate the personal privacy of learners. Educational technology platforms collect large amounts of sensitive data by tracking learners' online activities, learning progress, and behavioral patterns. These data include not only academic performance and preferences, but may also involve geographic location, communication records and even biometric information.[20] In many cases, students and parents lack sufficient knowledge about the specific circumstances in which personal information is collected, used, and shared by schools or third-party educational service providers. This lack of transparency makes it difficult for individuals to take control of their data and understand how it is being used to effectively assert their right to privacy. At the same time, the risk of learners' data privacy being exposed is also unpredictable. Schools and educational institutions can become targets of cyber attacks, and some educational applications and software with security vulnerabilities can become targets of cyber attackers. In addition, many countries lack effective data protection measures, and although many countries and regions have data protection laws in place, these measures, in practice, are often insufficient to cope with rapidly evolving digital technologies. Educational institutions and technology providers may fail to implement adequate security measures to protect stored data, increasing the risk of data being illegally accessed or compromised. Educational institutions use data analysis tools to monitor student learning processes and behavioral patterns. Such monitoring may be regarded as intrusive into the personal lives of students, especially when the monitoring activities are conducted without adequate notice and consent.

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18 See Selwyn N, „Digital Downsides: "Exploring University Students' Negative Engagements with Digital Technology", *Teaching in Higher Education*, Vol.21, 2016, pp.1006-1021.

19 See Xianpeng Tian, "Privacy Protection and Open Sharing: Educational Data Governance Reform in the Era of Artificial In telligence", E-education Research, Vol.5, 2020, pp.33-38.

20 See Daniel J. Solove, Understanding Privacy, Cambridge: Harvard University Press, 2008, p.30.

In short, with the in-depth application of educational technology, the invasion of digital technology and the challenges of privacy brought by it have become a problem that cannot be ignored. Personal data protection in education has become a complex and urgent issue, involving multiple aspects such as data security, privacy protection and personal freedom. The existence of these problems reflects the risks existing in the current digital education environment, and poses serious challenges to education practitioners, policy makers and technology developers.[21]

3. Alienation of educational subjects weakens the physical and mental development of reality.

With the in-depth integration of digital products, artificial intelligence and education, data has become the dominant force of the era, while the body in reality is gradually weakened. The alienation of education subjects and the weakening of students' physical and mental development in reality have become worthy of attention. In the era of digital education, the alienation of educational subjects is gradually obvious, which weakens the physical and mental development of teachers and students. This change involves a shift in the nature and goals of education and a multidimensional impact on the physical and mental development of students as they learn.[22] The alienation of educational subjects is mainly manifested in the reversal of the relationship between the ends and means of education. In the traditional education model, teachers as the main body of knowledge transmission and value guidance emphasize the humanistic care of education and the development of students' critical thinking. However, with the introduction of digital technologies, the focus of education has gradually shifted to the use and efficiency of technology. This change has marginalized the human element and overemphasized the technical element in the educational process. For example, educational platforms and online courses often focus on the completion of specific learning tasks and standardized tests, ignoring the role of education in fostering the well-rounded development of the individual. The role of teachers has changed from the original knowledge and wisdom transmitter to the operator of technology tools and curriculum manager, which has weakened the humanistic spirit of education and the interaction between teachers and students to a certain extent.

The impact of digital education on students' physical and mental development is multifaceted. On the one hand, prolonged screen use and lack of adequate physical activity can affect students' health. For example, frequent use of computers and other electronic devices increases the risk of vision problems, shoulder and neck pain, and other physical health problems.[23] Learning environments that lack physical interaction may lead to the degradation of students' social skills and affect their emotional and social development. Over-reliance on digital devices for learning may lead to distraction, mood swings, and increased anxiety and depression in students. Lack of face-to-face communication and hands-on learning experiences may also undermine students' ability to deal with real-world problems and their sense of self-efficacy. In addition, the immediate feedback and rapid reward mechanism in the digital learning environment may lead students to form short-term goal-oriented learning habits, ignoring the importance of deep thinking and long-term knowledge accumulation. This change in learning attitude may affect students' deep cognitive development and critical thinking ability. Most importantly, excessive use of digital media also consumes a lot of time and energy. This behavior of indulging in the virtual world will reduce the time of face-to-face communication with family and friends, which will lead to a series of psychological and social problems.[24] On the other hand, the digitization of education may lead to the alienation of teachers' professional roles. In the digital environment, teachers are not only responsible for knowledge transmission, but also need to master certain technical skills to design and manage online teaching content. These new requirements will distract teachers and make it difficult for them to focus on the essence of education and promote the all-round development of students. Over-reliance on technology and standardized teaching resources may also limit teachers' creativity and teaching autonomy, reduce the personalization of teaching, and then affect teachers' professional satisfaction and physical and mental health.

In short, although digital education has brought convenience and efficiency to educational practice, its alienation of educational subjects and weakening of students' physical and mental development cannot be ignored. These changes challenge the fundamental purpose of education, which is to produce well-rounded individuals. Therefore, understanding the nature and impact of these phenomena is important for the

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[21] See Huiqiong Zhao ; Qiang Jiang ; Wei Zhao , "Research on Security and Privacy Protection of Big Data Learning Analytics", *Modern Educational Technology*, Vol.3, 2016, pp.5-11.

22 See Hye Jung Han ,,How Dare They Peep into My Private Life?: Children's Rights Violations by Government-Endorsed Online Learning during the COVID-19 Pandemic,, Human Rights Watch, 补充卷号，2022, p.36.

23 See S.Madigan and others, ,,Association between screen time and children's performance on a developmental screening test,, JAMA Pediatrics, vol.173, 2019, pp.244–250.

24 See Wen Wu; Hu He; Zengrang Luo, "Theoretical Controversies and Research Evidence on Digital Media Use and Mental Health," *Medicine and Philosophy*, Vol.4, 2022, p.35.

development of future educational policy and the improvement of educational practice.

III. The basic path of ensuring the right to education in education digitization

In order to achieve the goal of education digitization and realize the proper state of the right to education, we should timely view the impact and risk brought by the development process of education digitization with a holistic view and a systematic thinking, reshape the path of the protection of the right to education, and seek the dynamic balance between education digitization and the protection of the right to education.

(I) Promoting the digital transformation of people-oriented education

The essence of the people-oriented lies in affirming the existence meaning of man as the ultimate goal. The purpose of the world and the "established trends" of history were unknown to mankind for a long time.[25] When considering the problems of time and space in which we live, we should not pursue the objective and external ultimate goal too much, but pay more attention to our own condition and future. It is hard to imagine the point of a system that does not bring happiness to people. Although people are questioning the past human-centered concept, it still needs to be admitted that in the evaluation of the world and the system, people must be and can only be the core, but we need to use a broader field perspective and a longer time perspective to evaluate the well-being of people.[26]

Putting people first in the digital transformation of education means putting the needs, experiences and development of students, teachers and other participants in learning at their core. This transformation needs to focus not only on the introduction and use of technology itself, but also on how technology serves the deep goal of education, which is to promote the all-round development and lifelong learning of everyone. The first is to optimize personalized learning pathways. Digital transformation offers the opportunity to personalize learning by tailoring instructional content and pathways to the interests and needs of each student. This personalized approach helps to stimulate students' learning motivation and promote their active learning and effective exploration. The second is to focus on mental health and social skills. While promoting the digitalization of education, students' mental health and social skills development cannot be ignored. Reasonable design of use time and integration of online and offline interaction should be adopted to ensure that students can maintain healthy learning and living habits and good interpersonal skills in the digital environment.[27] Finally, the professional autonomy of teachers must be fully respected. Teachers are not only knowledge transmitters, but also guides and explorers. The digital transformation of people-based education emphasizes that technology should serve education rather than replace traditional teaching models.[28] Educational institutions should also provide opportunities to help teachers master intelligent technology and encourage teachers to explore new applications of technology in teaching according to their professional judgment and innovative thinking. This opportunity for continuous learning and development not only enhances teachers' digital teaching capabilities, but also motivates them to be more creative and proactive in their teaching practice.[29]

(II) Digital empowerment: National obligations to realize the right to education in the digital age

Exploring the original purpose of establishing a country, it can be considered that it is to better protect individual rights. The beneficial function of basic constitutional rights also inherently requires the country to actively perform legal obligations. Therefore, the subject of legal obligations should be the country, and the country should form a digital national obligation paradigm through the performance of obligations to realize the right to education.

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[25] See Zhipeng He, "Globalization and the Humanistic Turn of International Law", *Social Science Journal of Jilin University*, Vol.1, 2007, pp.113-119.

[26] See [German] Kant, *Critique of Judgment*, translated by Xiaomeng Deng, Shanghai: People's Publishing House, 2002, pp.58-68.

[27] See Warschauer M, & Matuchniak T , "New Technology and Digital Worlds: Analyzing Evidence of Equity in Acce ss, Use, and Outcomes", *Review of Research in Education*, Vol.34, 2010, pp.179-225.

[28] See Phillips M, & Goodyear P, "Digital technology in education: A blessing or a curse?", *Journal of Educational Ch ang*e, Vol.20, 2019, pp.133-148.

[29] See Trust T, Krutka D. G, & Carpenter J. P, "Together we are better: Professional learning networks for teachers", *C omputers & Education*, Vol.102, 2016, pp.15-34.

1. Digital empowerment of safeguard obligations.

In the process of education digitization, legislative guarantee is an important link to ensure its healthy and orderly development. By improving the legal and normative system of education digitization, we can create basic conditions for the realization of the right to education, provide clear guidance and protection for students, teachers and educational institutions, and promote the innovation and application of technology.

Therefore, the legislature should first clarify the scope and principles of education digitization, including the basic framework of the use of educational technology, data protection and intellectual property rights. This definition helps to clarify the rights and obligations of the relevant parties and provides a legal basis for the implementation of education digitalization.[30] Second, strengthening data protection and privacy legislation is key to ensuring the healthy development of digital education. Considering the large amount of personal information and sensitive data generated in the education process, laws must be passed to prevent data leakage and abuse. At the same time, data ownership and use rights should be clarified to protect the data sovereignty of students and teachers. In addition, the development of specialized online teaching and learning quality standards is an important measure to improve the level of education digitalization. These include the review mechanism of online education resources, the certification standard of teachers' online teaching ability, and the evaluation method of online learning effect. Establishing these standards through legislation can ensure the quality and effectiveness of educational digital content and protect the learning rights and interests of students. Finally, encouraging and supporting innovation in educational technology is another important goal. Through the establishment of policy and legal incentive mechanisms, such as tax incentives, research and development subsidies, enterprises and research institutions can be stimulated to invest and innovate in the field of educational technology, and promote the development of education digitalization.[31]

2. Digital empowerment of payment obligations.

Digitally empowered payment obligation mainly refers to material payment obligation. According to the different purpose of establishment and functions of state organs, the core organ to undertake material payment task should be the administrative organ. Under the background of education digitalization, the state administrative organs guarantee the realization of the right to education by optimizing financial support, which mainly involves three aspects: ensuring equal access to educational resources, improving educational quality and supporting educational innovation.

First, we need to step up investment in infrastructure. The state should increase investment in educational technology infrastructure to ensure that schools, especially in rural and remote areas, have Internet access and the necessary digital electronic equipment. This is crucial to narrowing the education gap between urban and rural areas and ensuring learning opportunities for every student.[32] Article 13 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) is the most extensive and comprehensive provision on the right to education in international law. Article 13 states that education, in all its forms and at all levels, must meet the essential characteristics identified by the Committee on Economic, Social and Cultural Rights: availability, accessibility, acceptability and adaptability.[33] Among them, the availability of education means that a country should set up enough educational institutions and programs to operate within its jurisdiction. In the context of digitalization of education, this requires that governments should provide adequate computer facilities and information technology, as well as trained teaching staff with the necessary skills and qualifications to engage in digital education.

Secondly, teacher training and professional development should be promoted. Teacher training and professional development play a crucial role in the digital transformation of education. Teachers not only need to master traditional teaching skills, but also must adapt to emerging digital tools and platforms to improve

[30] See UNESCO, 2015, Policy Guide on Informatization in Education.

[31] See Organisation for Economic Co-operation and Development (OECD), 2019, Innovative Education: Technology and Teachers as Drive of Change.

[32] See Miller R, & Brown C, "Bridging the Digital Divide in Schools: Towards Equity in Digital Education", *Journal of Educational Policy*, Vol.34, 2019, pp.145-163.

[33] See Committee on Economic, Social and Cultural Rights, general comment, No.13 (1999), p.6.

teaching effectiveness and student engagement.[34] Therefore, governments and educational institutions should optimize financial support to ensure that teachers can receive continuous and high-quality professional development training, including how to effectively use online learning management systems, digital classroom tools, and how to integrate multimedia resources and virtual laboratories. The government can also encourage teachers to participate in research and innovation activities through financial support, such as application research of educational technology and innovative experiments of teaching methods. Such measures can not only improve the professional quality of teachers, but also promote the continuous update and improvement of education and teaching methods.

Finally, the economically disadvantaged should be supported. In the process of education digitalization, it is an important responsibility of national administrative organs to ensure that economically disadvantaged groups have equal access to high-quality educational resources. For example, the government could provide financial support to purchase or rent necessary learning tools and equipment for economically disadvantaged students. Governments could also set up special education subsidies and bursaries to subsidize study materials, Internet costs, and other study-related expenses for students from economically disadvantaged families. In addition, the government can also provide learning space and technical resources for students who do not have home networks or computer equipment by promoting and supporting the establishment and operation of community learning centers. By improving the accessibility of educational resources, it is possible to ensure that students from economically disadvantaged groups enjoy the same learning opportunities.

(III) Strengthen the supervision mechanism and the responsibility of risk prevention and control

In the context of digital education, activating the regulatory mechanism and filling the regulatory loopholes, strengthening the implementation of responsibility and risk prevention and control have become the key to ensure the healthy development of digital education. First of all, updating and improving laws and regulations is the basis for strengthening supervision. Therefore, a comprehensive regulatory system should be established, covering all aspects of technology, content and services. This requires education authorities to cooperate with relevant departments such as science and technology and network security to jointly establish a cross-departmental supervision mechanism, so as to ensure the technical security of digital education platforms, the authenticity and suitability of content, and the fairness and reliability of services. Thirdly, the evaluation and certification of digital education platforms and tools should be strengthened. By introducing third-party assessment and certification bodies, digital education products and services are subject to regular quality audits to ensure that they meet educational quality standards and safety requirements. This will not only enhance the credibility of digital educational tools, but also provide a reference for educational institutions and parents to choose high-quality educational resources. Finally, a sound complaint and feedback mechanism should be established to respond and deal with problems arising in the process of digital education in a timely manner. By setting up special supervision and complaint channels, teachers, students and parents are encouraged to actively reflect problems and opinions, which helps regulatory authorities to find and solve problems in time and prevent and control risks.

IV. Conclusions

In today's world, scientific and technological progress is changing with each passing day. Modern information technologies such as the Internet, cloud computing and big data are profoundly changing the way people think, produce, live and learn. Globally, education digitization is profoundly changing the face of education systems, and has a significant impact on the right to education. This transformation has brought many opportunities, such as the wide accessibility of educational resources and the improvement of teaching efficiency, but it has also triggered a series of challenges, especially the impact on education equity and the overall development of students. In assessing these impacts, we must carefully consider the potential conflicts of educational digitization with traditional educational values, and how it redefines the way education is conducted and the actual meaning of the right to education. Education is not only a fundamental human right, but a prerequisite for the realization of human rights for each individual, for himself and for his community and society. To ensure that the right to education is realized, continual and careful consideration is required in policy formulation and technology application. This means that while promoting the integration of technology and education, we must pay attention to the needs of human development and respect the humanistic values and social goals of education. Ultimately, education digitization should not only be a technological evolution process, but also a comprehensive social transformation, involving the integration and development of educational policies, educational practices and social values. In this process, we need to constantly review and adjust to ensure that the progress of technology serves the fundamental purpose of education, that is, to

[34] See Mishra P, & Koehler M. J , "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge", *Teachers College Record,* Vol.108, 2006, pp.1017-1054.

cultivate talents who can adapt to the all-round development of the future society.

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