Examining the optimal option for gender equality education in the digital era

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Abstract. According to the White Paper on the Development of China's Digital Economy 2021 published by the China Academy of Information and Communication Technology (CAICT), the size of China's digital economy will reach 39.2 trillion yuan in 2020, accounting for 38.6% of GDP and expanding by 9.7% annually. As the digital economy takes off at an accelerated pace, the social effects of the digital era and the transmission of core socialist values affect the lives of the general public, among which the promotion of gender parity in digital life through education and dissemination deserves specific focus.China's internet economy has grown amazingly during the past several years. However, the formation of gender identity in digital space and female subjectivity has flaws, such as women's lack of the right to speak, their vulnerability to marginalization and stigma, and their vulnerability to digital leakage and digital identity abuse. In addition, the emergence of algorithmic bias and implicit gender discrimination within the digital system has become a new problem for digital-era education for the equality of the sexes. Future gender-friendly digital equality spaces can be created by improving gender equality education, increasing the proportion of women developing digital technology, improving female digital literacy, raising publishers' awareness of gender equality, and strengthening regulators' understanding of the concept.

Keywords: Digital Gender Divide; Gender Equality Education; Digital Equality Space.

1. Introduction

China's internet economy has expanded recently, and the issue of gender equality perceptions arising from the digital economy has also emerged. In order to establish a gender harmonious and equal digital development environment, new paths still need to be explored in many ways. This study examines the manifestations of gender disparities in the digital era, the goals of promoting gender equality in digital development, and the essential techniques of advancing gender equality education throughout the digital education process. Among the digital era's manifestations of gender disparity, the manifestation phenomena are grouped into three categories: unfair access to digital resources and widening gender gap in the digital world, digital gender identity reconstruction and implicit gender discrimination, and violence of digital technology and security of digital gender identity. In response to the emergence of the above three phenomena, four improvement methods are proposed: stimulating individual subjectivity, raising awareness of gender equality in the digital education industry, focusing on the professional ethics of digital enterprises, and strengthening government regulation of the digital sector. Through these approaches, three goals can be achieved: digital gender identity reconstruction and implicit gender discrimination, elimination of gender labels in digital education, and elimination of women's violence and gender discrimination

2. Signs of Gender Inequality in the Internet Environment

The digital economy's expansion has accelerated and made social contacts easier, but it has also created new gaps. Regarding access to and use of digital technology, there is a significant disparity between nations, regions, social classes, and individuals. In low- and middle-income nations, more than 300 million fewer women than men use mobile devices to access the Internet, according to the "Gender Mobile Divide 2020" report issued by the German Educational Science Consortium [1]. Gender inequality in creating digital information is manifested in several ways, including the digital gender divide, implicit sexism, and gender violence in cyberspace.

2.1. Unfair access to digital resources and a widening gender gap in the digital world

The vast gender gap that digital information technology has caused between people of various genders is known as the "digital gender divide". This chasm may be seen in all aspects of the modern internet world. Digital gender disparity is seen in the use of digital devices, digital skill levels, and social spending on technology. According to ITU study based on the Digital Development Monitor 2019, just 8% of countries have more women online than males, 25% of nations have reached gender parity, especially in digital services. This leaves 52 percent of women globally who do not yet use the Internet [2]. Due to the pervasiveness of gender role indoctrination, sexism and stereotypes, unequal opportunities, the institutional structure of information technology, and the patriarchal cultural milieu, people live in a digital world constructed on the basis of male data. All these factors contribute to the digital gender divide.

2.2. Digital gender identity reconstruction and hidden gender discrimination

The number of women exchanging information online is significantly lower than that of males, indicating a significant gender gap in the digital world. Even fewer individuals are involved in the creation and decision-making of digital technologies. Women are underrepresented in the process of creating gender identity in this context and online. Because there aren't enough women working in AI, gender-blind digital technologies will amplify gender differences from a male perspective, flatten and homogenize gender inequality, present implicit gender inequality through databases and algorithms, and interpret it as a generalization and standardization of gender issues with the help of data representations. This is a continuation of the gender bias that was first present in digital products due to the traditional gender labor divide, and it has the potential to exacerbate gender inequality and give birth to digital sexism. Cases of gender discrimination have previously been documented in a number of digital systems, including facial recognition, search suggestions, creative hiring, financial credit giving, and big data in e-commerce. The proliferation of gender stereotypes is made worse by the power of digital technology's invisibility. As gender discrimination becomes institutionalized and acceptable in the digital era, gender stereotypes, prejudice, and discrimination against women and men become more pervasive.

2.3. Technology's brutality and gender identity's safety in the digital era

During the era of big data, issues such as data leakage, cyber aggression, and identity theft will arise if digital identities are not strongly protected. Women are the primary victims of electronic abuse and cybercrime due to the unpredictability of the digital world. There have been situations where male online taxi drivers have selectively assaulted female users based on their information on digital platforms, and some digital sites maliciously disclose personal information, private images, or videos. A female beta tester of Horizon Worlds' metaverse platform in 2021 claimed that she had experienced sexual harassment in the virtual environment. Women are still being attacked in digital life because of the vulnerability of their digital identities, even though Meta has recently included "personal limits." The Data Security Law of China was enacted in June 2021, correcting and regulating the internet platforms used by various big data corporations to obtain personal data. However, the sectors it covers are far from sufficient. From a gender viewpoint, digital security must ensure that each person is safe when using the internet, and online spaces should not be used to perpetrate illegal sexual assault or other types of violence.

3. Goals for advancing gender equality in digital development

The three major goals of educating for gender equality in the digital world are gender equality in decision-making, gender balance in the workplace, and gender equality involvement in digital progress. In addition, based on the OECD, education and training should improve gender equality in digital technology education, gender-balanced access to digital technologies, learning, skill acquisition, and traditional perceptions of women in technology education. The study "The

importance of education in bridging the digital gender gap" makes these statements. The report claims that education and training to support gender-balanced use, learning, and skill acquisition in digital technologies, enhance stereotypes of the traditional gender division of labor, alter women's traditional perceptions of digital technologies, and eradicate gender discrimination and violence in digital technology education can effectively advance gender equality [3].

3.1. Digital gender identity reconstruction and hidden gender discrimination

The government and schools encourage women to pursue careers in the digital field by increasing the learning, use and acquisition of digital skills, and provide an equal environment for the development of digital technology. Although math, science, and computer science are popular among students in most EU nations, the OECD reports that significantly fewer women than men choose to major in digital fields in higher education, such as mathematics, science, engineering, computer programming, etc. Only if more women enter the field of digital technology and acquire, use, and master its abilities can the gender gap in digital technology be effectively closed. The second goal is to establish gender parity among those deciding how to regulate and use digital technology. There will eventually be fewer individuals who can participate in decision-making if fewer and fewer women work in the digital field, fewer and fewer individuals will eventually be able to participate in decision-making. For example, women are 20% less likely than males to hold top leadership roles internationally in the mobile business [4]. Additionally, when society's understanding of gender equality and the modernized progression of gender cultural conceptions do not fully match and adapt to the development of the digital era, gender prejudice in the digital arena is aggravated. In order to expand the chances for women to learn and relearn, the pertinent departments must incorporate gender equality education into the area of digital learning, arouse students' enthusiasm for jobs in the field, and offer a platform for learning and development [5].

3.2. Gender stereotypes should be abandoned in digital education in order to build a gender balance viewpoint

Gender stereotyping is the idea that people focus too much on actual or imagined gender traits, exaggerate, simplify, or otherwise misrepresent them to apply them to a specific component of gender identity. Schools, parents, instructors, and various other organizations and people may have varied degrees of gender stereotypes in digital education. For example, girls are not supported to choose digital-related majors, believing that digital fields, including digital technology-related majors and jobs in school and the workplace, are "male-only"; women cannot reason and are not suitable for engineering studies, but rather for studies and jobs in the art and culture [6]. The devaluation and marginalization of women in education, hiring, and advancement in science, technology, engineering, and mathematics can result from digital education with a gendered language that undermines women's self-confidence and success in digital professions. Education philosophy, subjects, objects, contents, and teaching techniques should all be gender-sensitive, do away with gender labels and stereotypes, and decrease the impact of gender on decisions about subject specialization and career success.

3.3. Eliminate gender violence and prejudice in digital education

There are stereotypes concerning gender inequality and gender-based violence in the internet society. They are the erosion of digital identity and the denial of equal rights. In terms of educational efficacy, gender inequality can only be more effectively addressed by including gender equality education into digital education [7]. Sexism in digital technologies is both explicit and implicit. It ranges from individual perceptions to system structures. Explicit sexism is easily found in digital communications and in system structures. Digital communication can be easily detected and lead to public discussion of sexism. Public discourse, but implicit sexism in digital technologies is more damaging. Implicit sexism is more damaging because implicit sexism tends to create structural and systemic gender discrimination, which can reinforce and widen existing gender. According to the data, Google only promoted 318 positions to women while promoting 1852 opportunities with

incomes of $200,000 or more to the male population [8]. Algorithmic gender prejudice is embedded, unconscious bias against men in digital systems when algorithms routinely presume that males are better qualified for higher-paying employment and that men are more attractive for such positions. The gender imbalance that already exists can be exacerbated and amplified by the implicit gender prejudice unknowingly ingrained in digital technology. A certain amount and extent of this implicit, unintentionally ingrained gender bias tends to result in structural gender bias and gender violence throughout the digital system.

4. Strategies for Promoting Gender Equality Education in Digital Training

In the big data era, plurality characterizes data governance topics, and various complexities describe gender equality education. Individuals, parents, teachers, schools, digital businesses, and governments are all significant drivers in advancing gender equality in society and healthy digital development.

4.1. Stimulating individual subjectivity and breaking through the gender segregation of the digital society

The expansion of the digital economy provides additional work opportunities and opportunities for women to advance in their careers. As the complexity and usefulness of digital technology increase, so does the demand for digital talents with more specialized digital knowledge learning, comprehensive digital competence development, long-term digital experience accumulation, and permanent lifelong learning capability. To offset the influence of gender inequality on personal gender norms, everyone must explore their potential and extend their alternatives for future growth [9].

In addition to individuals, the goals of gender equality education in the digital sector should include parents and those associated with the industry. There are explicit or subliminal gender biases, long-standing gender stereotypes, and gender inequity throughout the educational system. Sometimes, rather than a lack of aptitude, women lack confidence in their math, scientific, and IT abilities because of cultural and parental preconceptions concerning the conventional gender-based work divide [10]. The future profession choices of children might also be influenced by parents' expectations and impressions of their children as they grow up. Raising women's willingness and confidence in the digital technology business can boost their willingness and confidence, increasing the possibility that they will work in the digital sector in the future.

4.2. Boosting gender equality education at universities and increasing awareness of sexual equality in the digital learning sector

The idea of gender equality is the acceptance of each person's subjective rights and freedom of growth in the gender dimension, together with their equality as individuals in terms of their human rights, dignity, and subjective status. As long as it doesn't go against the law, a person should be valued regardless of the gender appearance, conduct, or position they choose. The most successful setting for gender equality education is in the classroom, hence it is crucial to vigorously promote it in both schools and colleges [11]. To inform all facets of school education, schools include gender equality themes into their educational philosophy, educational systems, teaching methodologies, and teacher evaluations. The promotion of gender equality in schools is led by teachers. Teachers should be aware of the social importance of gender, the inherent differences between the sexes, and the origins and effects of persistent gender stereotypes. They should also be aware of how instructional materials and techniques are used and embrace more gender-inclusive educational strategies [12]. For instance, there are many individuals who think that males are more equipped than women to learn and advance in the fields of math, physics, and technology. This is related to gender preconceptions, which are prevalent in the sector of digital technology. Teachers with a gender perspective will not

only examine gender inequalities in digital technology as socially generated or natural, but they will also help and encourage groups to prevent gender segregation if there is an apparent gender split.

4.3. Optimize the educational environment, pay attention to the professional ethics code of digital enterprises, and eliminate digitally embedded gender discrimination

The digital gender disparity, data abuse, data security, and algorithmic sexism in the digital enterprise highlight the relevance of ethics in the digital economy [13]. In 2019, Google established an internal "Artificial Intelligence Research Ethics Committee" to strengthen the social responsibility of digital technicians. Digital technicians should focus on fairness and privacy protection and incorporate digital ethical principles like equality and anti-discrimination in their design programs and digital products. On the one hand, gender equality education should be integrated into the IT curriculum to train them [14]. In order to close the sexual gap in the digital industry, businesses should create specialized initiatives to increase women's digital literacy, capabilities, and interest. For instance, ABCN Australia's "Digi+Girls" initiative tries to pique middle school students' interest in digital technology. UN Women has also developed an innovative digital learning platform, the Virtual Skills School, designed to provide flexible training services for working women to help them gain access to learning and employment opportunities.

4.4. Strengthen government regulation of the digital sector and develop gender-friendly education policies and regulations in digital education

The Chinese Women Development Program (2021-2030) places a strong emphasis on the necessity of increasing the percentage of female students majoring in STEM fields, developing a multi-level system for educating women in these fields, and preparing them to compete globally [15]. To this end, people need to develop rules to guarantee these educational goals' achievement. Again, taking the OECD as an example, member nations of the organization have implemented several gender-inclusive frameworks and policies for women [16]. For instance, the Australian government has committed to giving US $4.5 million over the course of four years to support women in STEM-related research and training; the American National Science Foundation runs the ADVANCE program, which aims to increase female's engagement in engineering; and Germany launched the MINT (STEM) program to enhance the environment and perception of women in the digital field. In addition, the Talent Viewer initiative in the Netherlands provides a gender equality curriculum that instructs parents and educators on how to dispel gender preconceptions about the digital industry and acknowledge the value and potential of women in its advancement. These projects are educational and offer helpful advice for women interested in and skilled in the growth of the digital economy [17]. Finally, promoting gender equality in digital development calls on the collaboration of organizations, businesses, schools, instructors, and parents. The European Commission will release the Digital Education Action Plan (2021-2027) in September 2020 as the first phase of Europe's new initiatives to promote high-quality, inclusive, and accessible digital education [18]. Because the future of education is digital, it is vital to promote gender equality education in this sector, encourage more women to engage in the expansion of the digital economy, reduce the gender gap in the digital domain, and advance gender equality through business-government partnerships [19]. A more equitable, open, and inclusive digital future is on the way, thanks to the influence of digital education and the backing of gender equality education.

5. Conclusion

With the rapid expansion of the digital economy, the present construction of gender identity in the digital economy has some flaws that cannot match the digital economy's requirements for long-term development, and the problem of digital gender equality education must be addressed. At present, China is constantly trying to solve new problems of gender equality education from four aspects: stimulating individual subjectivity, raising awareness of gender equality in the digital education

industry, focusing on the professional ethics of digital enterprises, and strengthening government supervision of the digital sector. This paper analyzes that in improving the issue of educational equality in the digital economy, stimulating individual subjectivity focuses on parents' equal treatment of their children's future career choices and directions. For enterprises, facing the complexity and practicality of digital technology, they should explore the potential of different gender groups in order to apply it to business operation and management; for schools, the concept of gender equality should be integrated into all aspects of school education, including education concept and system, to encourage the development of the notion of gender parity; in terms of professional ethics of digital enterprises, enterprises should provide and establish special programs to develop female's capability, help them obtain learning and employment opportunities. For the government, the government should strengthen the supervision of the digital industry, and recognize the value and potential of women in improving the status of the digital industry through official channels.

References

[1] Caroline Criado Perez. Invisible women: Exposing data bias in a world designed for men. London: Chatto and Windus, 2019.

[2] OECD. Empowering women in the digital age: Where do we stand? Paris: OECD, 2018.

[3] Lihua Peng, Lili Dong. Policy suggestions and revelations on education bridging the digital gender gap -- Interpretation of the OECD report on the role of education and skills in bridging the digital gender gap. World Education Information, 2020.

[4] Reisch Roger, Goltz Sonia. Big data: Can the attempt to be more discrimination be more discrim- inatory Instead? Saint louis university law journal, 2016, 61(1): 5.

[5] Huiying Li. The concept and practice of gender equality education. Journal of China Women's College, 2021, 33 (3): 90-97.

[6] Yalan Zhu. "Women and science and technology" should become a new concern in the field of gender equality. Journal of Shandong Women's College, 2020, 1: 57-66.

[7] Zefang Dong, Qing He. The digital divide and educational inequality. Research on Higher Engineering Education, 2009, 4: 76-80.

[8] Besmir Shishko. The story of the digital age: Age and gender perspectives. TRAMES, 2022, 4: 397-411.

[9] R. M. Kowalski. Cyber bullying: Bullying in the digital age. MA: Blackwell Publishing, 2008.

[10] Sudirman, Rosramadhana, Ayu Febryani. Gender education in disruption era. Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 2020.

[11] Wenyu Wang. New concept and new practice of gender equality education at the background of digital society. EDP Sciences, 2022.

[12] Vivek Venkatesh, Anne-Marie Croteau, Jihan Rabah. Perceptions of effectiveness of instructional uses of technology in higher education in an era of Web 2.0, IEEE, 2014.

[13] C Padovani, K Ross . Ideas for gender-transformative futures of education in the digital age. Humanistic futures of learning, 2020.

[14] Susan Carol Losh. Gender, educational, and occupational digital gaps 1983-2002. Social Science Computer Review, 2004.

[15] Herman, Sherly, Yanti Kristina Sinaga, et al. Socialized implementation of digital literacy educators and students in the digital era. PENGABDIAN KEPADA MASYARAKAT, 2022.

[16] Qin Wang. Analysis of media literacy education for female adolescents from the perspective of network culture security. Modern Communication (Journal of Communication University of China), 2021, 43(06).

[17] Wei Dong, Li Ji. On university gender education in the new media environment: Opportunities and challenges. News and Communication Review, 2015.

[18] Xiaowen Wu. The impact of global value chain on gender income gap in the context of digital economy. Nankai University, 2022.

[19] Xuefang Zhou, Jindan Zhang. Reexamination of gender equality and differences in higher education -- based on the feminist perspective. Education and examination, 2022.