Relationship between Digital Literacy and Employment Ability of Vocational Undergraduate Students: The Parallel Mediating Role of Future Time Perspective and Career Decision Self-Efficacy

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Abstract: *Purpose:* To explore the relationship between digital literacy and the employability of college students, and to investigate the mechanism by which future time perspective and career decision self-efficacy play a role. *Method:* A survey was conducted on 577 college students using the Digital Literacy Scale, Employability Scale, Career Decision Self-Efficacy Scale, and Future Time Perspective Scale. *Results:* (1) Digital literacy, future time perspective, career decision self-efficacy, and employability are all significantly positively correlated with each other ($r = 0.65$–0.78, $P < 0.001$). (2) Digital literacy significantly positively predicts future time perspective, career decision self-efficacy, and employability. At the same time, future time perspective and career decision self-efficacy can both positively predict employability significantly. (3) Future time perspective and career decision self-efficacy have a parallel mediating effect between digital literacy and the employability of vocational undergraduate students. *Conclusion:* Digital literacy can directly affect college students' employability and can also indirectly affect college students' employability through future time perspective and career decision self-efficacy.

Keywords: Digital literacy; Future time perspective; Career decision self-efficacy; Employability

1. Introduction

In the fierce competition in the job market, enhancing individuals' employability is an important way to alleviate the problem of difficult employment. Improving the employability of college students has become the focus of attention of the government and all sectors of society [1]. Employability was first proposed by the British economist Beveridge. It reflects the comprehensive qualities of an individual in obtaining a job, maintaining

employment, and regaining employment in the labor market, and it helps to improve an individual's current job performance and the development of their overall career [2]. Previous studies have found that employability is a prerequisite for promoting individuals to take more active job-seeking behaviors and achieving career success [3]. Against the background of the increasingly severe employment situation, colleges and universities should take improving students' employability as a means to achieve the new goal of "high-quality and full employment" for graduates.

Against the background of the new era empowered by digital intelligence, whether college students choose to seek employment or engage in innovation and entrepreneurship, they should possess good digital literacy. Colleges and universities should also attach importance to the cultivation and development of the digital literacy of students on campus. This is not only an inevitable requirement for survival and development in a digital society, but also a solid foundation for improving the quality of talent cultivation in the digital age [4]. However, in the current employment guidance curriculum system, colleges and universities as well as full-time teachers pay inadequate attention to the importance of digital literacy in enhancing the employability of college students.

Digital literacy refers to "the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies, so as to promote employment" [5]. According to the resource conservation theory, individuals will continuously preserve and acquire more valuable resources, such as employment and job positions, through their interaction with surrounding situational elements [5]. Specifically, digital literacy can enhance an individual's ability to perceive, utilize, and transform career-related information, and to a certain extent, affect their employability, enabling them to compete for more job opportunities. How to screen, organize career positions that match oneself, and share, communicate, and creatively use employment information with others depends to a certain extent on an individual's level of digital literacy. Good digital literacy can improve college students' abilities in autonomous learning, logical thinking, analysis and judgment, etc., and demonstrate more excellent employability in the future labor market [6].

Digital literacy can affect the employability of college students. Future time perspective may be an important mediating factor. Future time perspective is a personality trait of an individual's cognition, experience, and action tendency toward future time (mainly including future social development and self-development) [7]. Digital literacy reflects an individual's abilities in three aspects: technology, cognition, and socio-emotion. It helps individuals form a relatively clear cognitive representation of the future and improves their cognitive ability of future time, thus affecting an individual's future time perspective [8]. Digital literacy represented by digital information retrieval, communication, and collaboration with digital tools, etc., helps college students broaden and innovate the potential paths to obtain employment information, which can break the limitations brought by the "information gap" and further promote their perception and planning of the future. Existing foreign studies have found that digital literacy can enhance an individual's future time perspective, making them more confident when entering the job market [9]. Meanwhile, it is believed that future time perspective has the characteristics of both cognition and motivation, which has a driving effect on an individual's realization of future career goals, promoting the improvement of their employability while learning the skills required in the learning career. To sum up, digital literacy may affect the employability of college students through future time perspective.

Career decision self-efficacy refers to the confidence shown by individuals in a series of career choice activities, including making accurate self-evaluations, collecting career information, screening career goals, problem-solving skills, and career planning. According to the socioemotional selectivity theory, college students' future time perspective is regarded as an individual's aptitude for future choices. People strategically

and adaptively plan their future career directions through such choices and make career decisions in a way that maximizes social and emotional benefits. In the socioemotional selectivity model, college students' internal career decisions will gradually change with their future time perspective [10]. Future time perspective plays a fundamental role in goal selection. When an individual has a broad perspective of future time, they tend to focus more on long-term future goals; when an individual believes that future time is limited, they are more inclined to pursue goals that can be achieved in the short term. The higher an individual's future time perspective, the higher career decision self-efficacy.

This study aims to explore the interrelationships among digital literacy, future time perspective, career decision self-efficacy, and employability, and to reveal the internal mechanism by which digital literacy affects employability, thus providing theoretical basis and empirical support for exploring new paths to update the employment guidance curriculum system in higher education in the new era and enhancing the employability of college students. The main objectives are as follows: (1) To examine the predictive effect of digital literacy on the employability of college students; (2) To explore the mediating role of future time perspective between digital literacy and the employability of college students; (3) To explore the mediating role of career decision self-efficacy between digital literacy and the employability of college students.

2. Methods

2.1. Participants and methods

In this study, the convenience sampling method was adopted (Wenjuanxing). The questionnaire collection period was from March to July 2024. By filling out the questionnaire, the participants were deemed to have agreed to participate in this questionnaire survey. Students could withdraw at any time during the survey. Eventually, 577 questionnaires were collected.

2.2. Measurements

The Digital Literacy Scale for College Students compiled by Li [11] was adopted. It contains a total of 41 items with a Likert 5-point scale (1 = completely not applicable to 5 = completely applicable). The higher the total score, the higher the level of digital literacy.

The Future Time Perspective Scale compiled by Song *et al.* [12] was adopted. It consists of a total of 20 items with a Likert 5-point scale (1 = completely not applicable to 5 = completely applicable). The higher the total score, the higher the level of future time perspective.

The Employability Scale compiled by Wang [13] was adopted. It contains a total of 23 items with a Likert 5-point scale (1 = completely not applicable to 5 = completely applicable). The higher the score, the higher the level of employability.

The Career Decision Self-Efficacy Scale compiled by Betz and Taylor and revised by Peng and Long [14] was adopted. The scale has a total of 39 items with a Likert 5-point scale (1 = completely not applicable to 5 = completely applicable). The higher the score, the higher the career decision-making self-efficacy.

3. Result

3.1. Correlation analysis

There were significant positive correlation relationships between digital literacy ability and future time perspective ($r = 0.680$, $P < 0.001$), between digital literacy ability and employability ($r = 0.760$, $P < 0.001$), and

between digital literacy ability and career decision self-efficacy ($r = 0.654$, $P < 0.001$). Moreover, there were also positive correlation relationships between future time perspective and employability ($r = 0.770$, $P < 0.001$) and between future time perspective and career decision self-efficacy ($r = 0.718$, $P < 0.001$). Finally, there was also a positive correlation relationship between employability and career decision self-efficacy ($r = 0.789$, $P < 0.001$).

3.2. Test of parallel mediating effects

This study used JASP 0.19.1 (JASP - A Fresh Way to Do Statistics, jasp-stats.org) to conduct a test of parallel mediating effects (parallel mediating variables: future time perspective and career decision self-efficacy). The results are shown in **Figure 1**. Digital literacy significantly and positively predicted future time perspective ($\beta = 0.030$, $P < 0.001$), career decision self-efficacy ($\beta = 0.029$, $P < 0.001$), and employability ($\beta = 0.014$, $P < 0.001$). Meanwhile, both future time perspective ($\beta = 0.281$, $P < 0.001$) and career decision self-efficacy ($\beta = 0.376$, $P < 0.001$) could significantly and positively predict employability.

The Bootstrap 95% confidence intervals (CI) (with 5000 samples) of the two mediating paths did not include 0, indicating the existence of two parallel mediating paths: "digital literacy → future time perspective → employability" (Effect size: 0.009, $P < 0.001$, Bootstrap 95% CI: 0.006–0.011) and "digital literacy → career decision self-efficacy → employability" (Effect size: 0.011, $P < 0.001$, Bootstrap 95% CI: 0.009–0.014), with significant mediating effects. The effect value of the direct mediating effect of digital literacy on employability was 0.014, $P < 0.001$, Bootstrap 95% CI: 0.011–0.018.
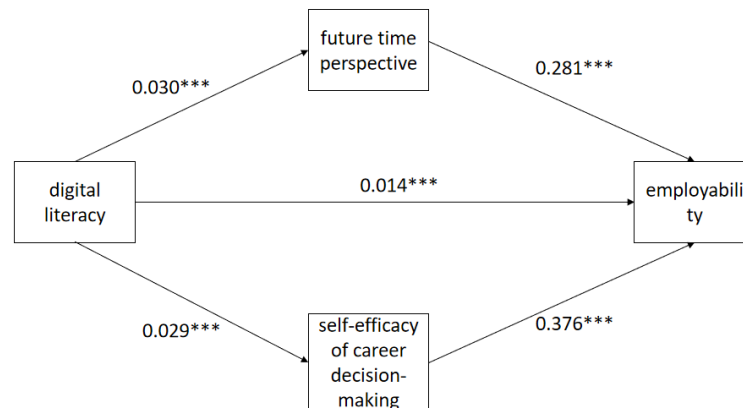

Figure 1. The mediating path. Note: *significant at $P < 0.05$, **significant at $P < 0.01$, ***significant at $P < 0.001$.

4. Conclusion

This study constructed a parallel mediation model to comprehensively explore the impacts of digital literacy, future time perspective, and career decision self-efficacy on the employability of college students. It mainly investigated the mechanism of action of future time perspective and career decision self-efficacy between digital literacy and the employability of college students, which helps to understand more comprehensively the internal mechanism by which digital literacy affects employability in the context of the digital economy era. The research results have certain theoretical and practical significance for enhancing the employability of college students.

Digital technologies empower all aspects of economic and social development. Meanwhile, digital literacy

has also drawn high attention from the theoretical and educational circles, and the research achievements in this field have gradually become abundant. This paper further focuses the research spotlight on the impact of digital literacy on the employability of college students. The research findings reveal that there is a significant positive correlation between digital literacy and the employability of college students, that is, good digital literacy can promote the enhancement of college students' employability. It is an important factor affecting an individual's job acquisition and employment maintenance, and one of the requirements of many contemporary jobs [6].

The research findings show that the mediating effect of future time perspective between digital literacy and the employability of college students is significant. Digital literacy can not only directly affect the employability of college students but also further influence it through the mediating role of future time perspective. For college students who have not yet entered the job market, improving their digital literacy level can help them better understand the relevant skills required for future jobs and enable them to have a full understanding of the job market before graduation. Meanwhile, graduates with a higher future time perspective often have clearer career goals, which can motivate them to learn career-related skills more actively, thereby enhancing their individual employment competitiveness. This also further enriches the theory of future time perspective [8]. The research findings also revealed that the mediating effect of career decision self-efficacy between digital literacy and the employability of college students is significant. It was found that there is a significant positive correlation between digital literacy and the career decision self-efficacy of college students, and digital literacy can promote the cultivation of individuals' career decision self-efficacy.

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Disclosure statement

The author declares no conflict of interest.

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