

Digital Literacy and Career Decision-Making Self-Efficacy Among University Students

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Abstract

In the context of rapid digital transformation, digital literacy has become an essential competency influencing university students' career development. This study examines the relationship between digital literacy and career decision-making self-efficacy (CDSE) among university students. Using a quantitative cross-sectional design, data from over 200 students were analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). Digital literacy was conceptualized as a multidimensional construct, while CDSE reflected confidence in career-related decision-making tasks. The results reveal that digital literacy has a statistically significant but negative effect on CDSE, suggesting that higher levels of digital literacy may be associated with lower confidence in career decisions. This may be due to increased exposure to complex and abundant career information, which can heighten uncertainty. The findings highlight the dual role of digital literacy and suggest that higher education institutions should complement digital skills training with structured career guidance to better support students' decision-making.

Keywords: Digital Literacy; Career Decision-Making Self-Efficacy; University Students; Career Development; Digital Competence; PLS-SEM

1. Introduction

In the context of rapid digital transformation, the integration of information technologies into education and the labor market has fundamentally reshaped the competencies required of university graduates. Digital technologies are not only changing how knowledge is accessed and applied, but also redefining the processes through which individuals explore careers, acquire professional skills, and make career-related decisions. As a result, digital literacy has emerged as a critical competency for students navigating increasingly complex and technology-driven career environments. It encompasses not only technical skills but also the ability to critically evaluate information, adapt to digital changes, and effectively utilize digital tools for problem-solving and decision-making.

Career decision-making self-efficacy (CDSE), defined as an individual's confidence in their ability to successfully perform tasks related to career decision-making, plays a central role in students' career development. High levels of CDSE are associated with clearer career goals, stronger career commitment, and more adaptive career behaviors. Conversely, students with low CDSE often experience uncertainty, indecision, and anxiety when facing career choices. In the digital era, where career information is abundant yet often fragmented and overwhelming, the ability to confidently navigate career options becomes even more essential. Therefore, identifying key factors that can enhance students' CDSE is of significant importance for both educational practice and career guidance.

Although prior research has examined various psychological and contextual determinants of CDSE, relatively limited attention has been paid to the role of digital literacy in shaping students' confidence in career decision-making. Given that career exploration, job searching, and skill development increasingly rely on digital platforms, it is reasonable to expect that students with higher levels of digital literacy may feel more capable and confident in making career decisions. However, empirical evidence on this direct relationship remains insufficient,

particularly in the context of higher education. To address this gap, the present study aims to examine the direct effect of digital literacy on college students' career decision-making self-efficacy, thereby providing empirical support for the role of digital competencies in career development.

2. Literature Review

Digital literacy has become an essential competency for university students in the digital era, enabling individuals to effectively access, evaluate, and utilize information in technology-rich environments. It is commonly conceptualized as a multidimensional construct that includes technical skills, information processing abilities, digital communication, and awareness of online safety (Eshet, 2004; van Laar et al., 2017). With the increasing reliance on digital platforms for learning and career-related activities, digital literacy plays an important role in shaping students' adaptability and learning outcomes. Prior research has demonstrated that higher levels of digital competence are associated with stronger self-efficacy, strategic information use, and improved academic and developmental outcomes (Hatlevik et al., 2015; Ng, 2012). These findings suggest that digital literacy is not only a technical capability but also a critical resource that supports individuals' confidence and effectiveness in complex, information-rich environments.

Career decision-making self-efficacy (CDSE) refers to an individual's belief in their ability to successfully perform tasks related to career exploration, evaluation, and decision-making. The concept was originally introduced by Taylor and Betz (1983) based on self-efficacy theory and has since become a central construct in career development research. Subsequent studies have further validated its importance, showing that CDSE is positively associated with career exploration, career commitment, and reduced career indecision (Betz et al., 1996; Choi et al., 2012). Grounded in social cognitive career theory (Lent et al., 1994), CDSE is influenced by both individual capabilities and environmental factors. However, relatively limited attention has been paid to the role of digital competencies in shaping career decision confidence. In increasingly digitalized career environments, where access to occupational information and opportunities depends heavily on effective technology use, digital literacy may serve as a critical factor influencing students' confidence in making career decisions. Therefore, examining the relationship between digital literacy and CDSE can provide valuable insights into how digital competencies contribute to students' career development.

3. Research Design and Method

Drawing on the growing importance of digital competencies in career development, digital literacy is expected to play a significant role in shaping students' confidence in career decision-making. Individuals with higher digital literacy are generally more capable of accessing, evaluating, and utilizing online career-related information, which may enhance their perceived ability to manage career exploration and decision tasks. Career decision-making self-efficacy (CDSE) refers to individuals' confidence in successfully engaging in career exploration and decision-making processes. Accordingly, this study proposes the following hypothesis: H1: Digital literacy has a positive effect on career decision-making self-efficacy.

To empirically test this hypothesis, a quantitative, cross-sectional survey design was adopted. The study targeted university students from higher education institutions, and data were collected using a convenience sampling approach. A total of more than 200 valid questionnaires were obtained, and participation was voluntary with respondents informed of the study's purpose prior to data collection.

A structured questionnaire was employed as the research instrument. All measurement items were adapted from previously validated scales with minor modifications to fit the research context. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. Digital literacy was conceptualized as a

multidimensional construct, including technical operational skills, information literacy, digital security awareness, and digital communication competence. CDSE was measured through items reflecting confidence in career exploration, evaluation, and decision-making tasks. A pilot test was conducted prior to the formal survey to ensure clarity and content validity, leading to minor refinements.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS software. The analysis followed a two-stage approach. First, the measurement model was assessed in terms of internal consistency reliability, convergent validity, and discriminant validity using Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and the heterotrait–monotrait (HTMT) ratio. Second, the structural model was evaluated to test the hypothesized relationship between digital literacy and CDSE, with path significance assessed through bootstrapping with 5,000 resamples.

4. Results

4.1. Measurement Model

To ensure the soundness of the measurement model, reliability and validity were assessed in terms of internal consistency reliability and convergent validity. SmartPLS 4.0 was used for model estimation. Internal consistency reliability was evaluated using Cronbach's alpha (α) and composite reliability (CR). As shown in Table 1, all constructs demonstrated satisfactory reliability, with Cronbach's alpha values ranging from 0.863 to 0.921 and composite reliability values ranging from 0.890 to 0.945, both exceeding the recommended threshold of 0.70.

Convergent validity was assessed using the average variance extracted (AVE). The AVE values for all constructs ranged from 0.576 to 0.678, surpassing the recommended threshold of 0.50, indicating that the constructs explain a sufficient proportion of the variance in their indicators. Overall, these results suggest that the measurement model exhibits adequate reliability and convergent validity.

Table 1 Results of the reliability and validity of PLS-SEM

	Cronbach's alpha	Composite reliability (rho_a)	Average variance extracted (AVE)
Career decision self-efficacy	0.921	0.945	0.678
Digital Literacy	0.863	0.869	0.576

4.2. Structural Model

The structural model was assessed using SmartPLS 4.0 by examining path coefficients and their significance through bootstrapping procedures. As shown in Table X, digital literacy had a significant negative effect on career decision-making self-efficacy, supporting H1. This result indicates that digital literacy is significantly associated with career decision-making self-efficacy; however, the relationship is negative, suggesting that higher levels of digital literacy are linked to lower levels of career decision-making self-efficacy among university students.

5. Conclusion

This study examined the relationship between digital literacy and career decision-making self-efficacy (CDSE) among university students using a PLS-SEM approach. The findings reveal that digital literacy has a statistically significant effect on CDSE; however, the relationship is negative. This suggests that higher levels of digital literacy may be associated with lower confidence in career decision-making.

One possible explanation for this finding is that students with higher digital literacy are more exposed to diverse and complex career information in digital environments. While such access can broaden perspectives, it may also increase uncertainty and difficulty in evaluating career options, thereby reducing confidence in decision-making. In contrast, students with lower levels of digital literacy may rely on more limited information sources, which could lead to relatively higher perceived certainty in their career choices.

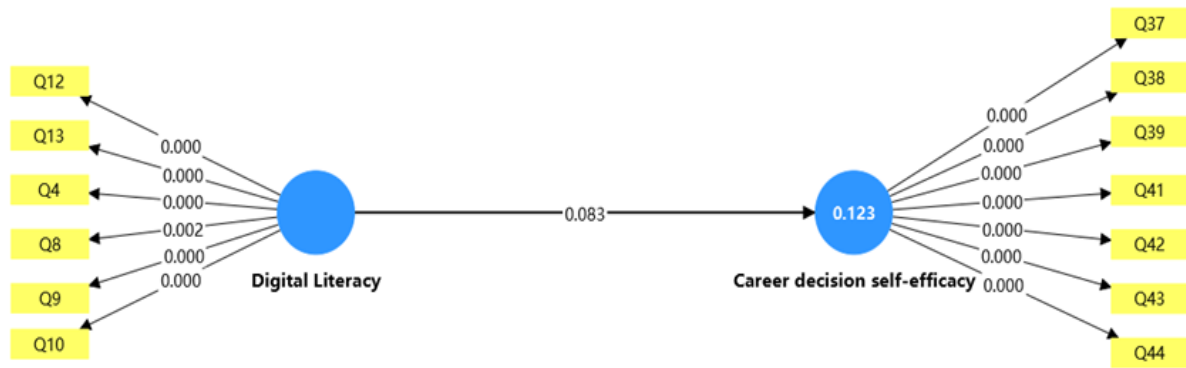


Figure 1 Structural Model with Path Coefficients

These findings highlight the dual role of digital literacy in career development. While digital competencies are generally considered beneficial, excessive or unstructured exposure to information may have unintended effects on students' confidence in making career decisions. Therefore, higher education institutions should not only focus on improving students' digital literacy but also provide structured career guidance and information filtering support to help students effectively navigate digital career resources.

Despite its contributions, this study has several limitations. First, the use of a cross-sectional design limits the ability to draw causal inferences. Second, the sample was limited to university students, which may affect the generalization of the findings. Future research could explore additional variables, such as psychological or contextual factors, and adopt longitudinal designs to further examine the relationship between digital literacy and career development outcomes.

Reference

- Betz, N. E., Klein, K. L., & Taylor, K. M. (1996). Evaluation of a short form of the career decision-making self-efficacy scale. *Journal of Career Assessment*, 4(1), 47–57.
- Choi, B. Y., Park, H., Yang, E., Lee, S. K., Lee, Y., & Lee, S. M. (2012). Understanding career decision self-efficacy: A meta-analytic approach. *Journal of Career Development*, 39(5), 443–460.
- Eshet, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, 13(1), 93–106.
- Gati, I., & Saka, N. (2001). High school students' career-related decision-making difficulties. *Journal of Counseling & Development*, 79(3), 331–340.
- Hatlevik, O. E., Guðmundsdóttir, G. B., & Loi, M. (2015). Digital diversity among upper secondary students: A multilevel analysis of the relationship between cultural capital, self-efficacy, strategic use of information, and digital competence. *Computers & Education*, 81, 345–353.
- Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, 45(1), 79–122.

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, 59(3), 1065–1078.

Taylor, K. M., & Betz, N. E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior*, 22(1), 63–81.

van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577–588.

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Acknowledgements

This study was supported by the University-level Scientific Research Initiation Project of Hanshan Normal University (No. QD2024108), the project Research on the Digital Competence Framework and Training Pathways of Pre-service Teachers Based on the “Teacher Digital Literacy” Standard (No. 2024WTSCX064) and Hanshan Normal University Professor Startup Project: Exploration of the Cultivation Mechanism of Pre-service Teachers’ Digital Literacy under the Background of Educational Digital Transformation (Project No. QD202308).