Chapter 2
Serious Games:
A Study on Digital Literacy and Skill Improvement of Architecture Students in China Vocational Institute

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ABSTRACT

Students in vocational colleges in China play a crucial role in supporting the digital transformation of education. In this study, a vocational institute in Jiangsu province was selected for investigation, involving 79 students. The findings revealed that traditional classrooms still face limitations in enhancing students' digital literacy and skills. To address this issue and better equip students with the digital literacy and learning skills required by society, a serious game model was developed for the architecture professional course "Architecture CAD Drawing." This model presents core course content through case pictures and promotes interactive engagement. A user study involving 42 vocational architecture students was then conducted to compare the effectiveness of serious games with traditional video classes. The results demonstrate that Serious Games significantly enhance student interest in utilizing digital technology for learning, improve their efficiency in acquiring professional skills, and deepen their comprehension of digital literacy.

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1 INTRODUCTION

The digital transformation of higher vocational education is the key to the high quality development of higher vocational education(Wang et al.,2023). In 2007, The International Society for Technology in Education (ISTE) identified “digital citizenship literacy” as one of the six standards of National educational technology standards for students.The Digital Education Action Plan (2021-2027) is a EU policy initiative aiming to support the adaptation of the education and training systems of Member States to the digital age. This plan is inspired by the common vision of high-quality, inclusive and accessible digital education(Outeda, 2024). China's vocational education has also entered an era of rapid digital development. Students in China's vocational colleges are not only crucial supporters of the digital transformation of education but also the core force behind the digital advancement of modern vocational education. Therefore, students need to be trained in digital literacy skills for the world of work(Jatmoko et al.,2023).

In 2020, China's Ministry of Education and nine other departments issued the Action Plan for Improving the Quality of Vocational Education (2020-2023). This plan clearly proposed: “The implementation of vocational education information 2.0 construction action should vigorously improve the level of vocational education information construction, and comprehensively improve the digital literacy of vocational college students, including the use of network information technology and high-quality online resources for independent learning ability.” Since 2022, China's Ministry of Education has frequently referenced digital literacy in its conferences and policies. For example, at the National Education Work Conference in January 2022, the implementation of education digitization action was proposed as a crucial reform measure for China's education sector. In 2024, the Chinese government issued Key Points of Work to Upgrade Digital Literacy and Skills for all by 2024(2024), which explicitly stated the need to cultivate high-level composite digital talents. This initiative aims to comprehensively improve the digital literacy and skills of both teachers and students.

Europe and the United States have conducted in-depth research on cultivating teachers' digital literacy for some time, developing relatively mature models and practical experiences. The United Kingdom, the United States and other countries have attached great importance to the cultivation of digital literacy.(Polizzi,2020; Alexander et al.,2017). For example, the United Kingdom proposed a strategy for cultivating digital literacy in the British Digital Strategy. Different policies, initiatives and strategies are currently being proposed in Germany, addressing educational technology innovations in Higher Education(Bond et al.,2018). In 2020, the EU issued the Digital Education Action Plan 2021-2027, which proposed two key measures: (1) requiring countries to build and improve digital infrastructure, create