

A Study on Teacher Satisfaction in Simulated Classrooms for Preschool Education Majors in Higher Vocational Colleges in Beijing

Lin Li, Amelia Binti Alias, Nurfaradilla Mohamad Nasri

Faculty of Education, Universiti Kebangsaan Malaysia, Bangi, Malaysia

Abstract: This study focuses on preschool education majors in higher vocational colleges in Beijing, targeting teachers utilizing simulated classrooms. It investigates the impact of Virtual Reality (VR) technology on teacher satisfaction. Grounded in Self-Determination Theory (SDT) and Cognitive Load Theory (CLT), a quantitative research approach was employed, involving questionnaire surveys with 250 preschool education teachers from 5 higher vocational colleges. The research analyzes the direct impact of different types of VR technology (360° video, immersive VR, etc.) on teacher satisfaction, alongside the mediating roles of learning immersion and cognitive load. Results indicate that VR technology application significantly enhances teacher satisfaction regarding teaching effectiveness, classroom engagement, and other aspects. Learning immersion and optimized cognitive load function as critical mediating variables. The study provides a theoretical foundation for designing simulated classroom teaching in preschool education and offers practical references for educators to optimize teaching practices and policymakers to refine educational technology application strategies.

Keywords: Higher Vocational Colleges; Preschool Education; Simulated Classroom; Teacher Satisfaction; Virtual Reality Technology; Learning Immersion; Cognitive Load

1. Introduction

1.1 Background

With the rapid advancement of Virtual Reality (VR) technology, its application in education has become increasingly widespread, attracting significant attention particularly within preschool education. As a critical period for children's cognitive and emotional development, the quality of preschool education profoundly impacts their future learning abilities and social adaptability [1]. Against a backdrop of evolving educational demands and continuous technological progress, traditional teaching methods face numerous challenges in capturing student attention and enhancing learning interest, gradually proving inadequate.

VR technology, as an immersive teaching tool, enables the creation of more interactive, engaging, and multi-sensory learning environments. Teachers leveraging VR can transcend the spatial and temporal constraints of traditional classrooms, constructing creative and interactive virtual teaching scenarios that effectively stimulate student interest and boost participation and motivation. In simulated classrooms for preschool education, VR technology not only enhances student learning outcomes but also provides teachers with practice environments closely approximating reality, aiding in the development of teaching skills and subsequently influencing teacher satisfaction [2]. However, current research on VR in preschool education predominantly focuses on student learning outcomes and classroom interaction, paying less attention to teachers' experiences and satisfaction following VR technology use. Teacher satisfaction is a vital indicator of educational quality and teaching effectiveness, directly impacting the quality and sustainability of teaching practices. Therefore, an in-depth exploration of how VR technology affects teacher satisfaction in preschool simulated classrooms holds significant importance. This study employs Self-Determination Theory (SDT) and Cognitive Load Theory (CLT) as its theoretical framework to analyze how VR technology enhances teacher experience and satisfaction by improving learning immersion and optimizing cognitive load management.

1.2 Statement of Problem

Although VR technology is increasingly applied in preschool education, research on its impact on teacher satisfaction within preschool simulated classrooms remains relatively scarce [3]. Existing studies primarily center on student learning outcomes in VR classrooms, with limited investigation into teachers' teaching experiences, satisfaction, and technology usage in simulated settings. As the primary facilitators of teaching activities, teacher satisfaction directly influences teaching engagement and quality, thereby affecting student learning outcomes. Consequently, this study aims to address this research gap by thoroughly investigating how VR technology enhances overall teaching satisfaction by influencing teachers' learning

immersion and cognitive load management.

1.3 Research Objectives

RO1: To investigate the direct impact of different types of virtual reality technology on teacher satisfaction in preschool simulated classrooms.

RO2: To analyze the mediating role of learning immersion between the application of virtual reality technology and teacher satisfaction.

RO3: To analyze the mediating role of cognitive load in the impact of virtual reality technology application on teacher satisfaction.

1.4 Research Questions

RQ1: How do different types of virtual reality technologies affect teacher satisfaction in preschool simulated classrooms?

RQ2: What mediating role does learning immersion play in the relationship between virtual reality technology application and teacher satisfaction?

RQ3: How does cognitive load affect the impact of virtual reality technology application on teacher satisfaction?

1.5 Hypotheses

H1: The type of virtual reality technology (360° video, immersive VR) has a significant positive impact on teacher satisfaction in preschool simulated classrooms.

H2: Learning immersion plays a significant mediating role between the application of virtual reality technology and teacher satisfaction.

H3: Cognitive load plays a significant mediating role in the impact of virtual reality technology application on teacher satisfaction.

2. Literature Review

2.1 Application and Development of Simulated Classrooms

Simulated classroom training is to facilitate students' practice in a simulated environment and increase their teaching skills by replicating real-life teaching situations. For the preschool teacher education program, simulated classrooms have become an essential part of teaching. Virtual classrooms are not only able to give students hands-on experience, but also enable the creation of a simulated learning environment by using virtual reality (VR) technology so that students can feel the process of teaching in a real classroom [4]. This way of teaching is able to significantly enhance students' classroom management capability and teaching response capability.

In the progression of science and technology, simulated classroom mode has also changed. From the traditional role-play, to current simulation through virtual reality technology, pedagogy and learning experience have changed significantly. stated that the VR technology could overcome the limitations of time and space of traditional pedagogy and provide the preschool education students with a more interactive and richer learning experience. Through virtual classrooms, not only can the students acquire the minimum knowledge required in preschool education, but also rehearse various teaching situations in a simulated environment, thereby boosting their teaching confidence and ability [5].

2.2 Definition and Influencing Factors of Teaching Satisfaction

Teaching satisfaction is the students' evaluation of the teaching process and teaching result, which has direct effects on the quality of education [6]. Teaching satisfaction, apart from affecting students' learning motivation, is also inseparable from students' learning achievement and classroom performance. The students majoring in preschool education is affected by a wide range of factors, including teaching content, teaching methods, classroom communication, learning environment, and integration of technology.

The research suggests that student teaching satisfaction is strongly related to the practicability of teaching material. Especially in simulated classrooms, practicability of teaching material and how close it is to student learning needs are decisive factors in student satisfaction. According to Oiwake et al.'s (2018) research[7], the efficacy of classroom communication and instructional methods also has a direct impact on student satisfaction towards simulated classrooms. Participatory teaching approaches and interactive education can usually do much to enhance the learning experience of students.

2.3 Factors Affecting Satisfaction with Simulated Classroom Teaching

Teaching materials and teaching methods are direct factors affecting students' satisfaction. For preschool education students, whether the teaching materials are applicable to actual teaching needs and whether the teaching methods can

stimulate students' interest and participation have direct effects on students' satisfaction with simulated classrooms. Studies have shown that interactive teaching and teaching methods with high participation are capable of effectively promoting students' classroom participation and satisfaction [8].

Learning immersion refers to the level at which the students are strongly engaged and focused on activities within the learning process. In the virtual classrooms, especially when utilizing virtual reality tools, learning immersion is important within the learning accomplishment and satisfaction of students. Virtual reality technology can create a simulation learning environment for students, which would engage them as if they were in real teaching situations, thereby increasing their learning interest and class participation [9]. Li [10] argues that increased immersion can promote students' overall satisfaction with simulated classrooms, especially in high-teaching content and interactivity classrooms, where immersion becomes an important factor.

Cognitive load refers to the amount of information and its complexity that learners need to process during the learning process. Excessive cognitive load will affect students' learning effects, distract their attention, and reduce class satisfaction [11]. In simulated classrooms, especially when using virtual reality technology, students may face information overload. Therefore, reasonable control of cognitive load is an important factor in improving teaching satisfaction in simulated classrooms. Optimizing teaching design, reasonably allocating learning tasks, and helping students process and absorb information can effectively reduce cognitive load and improve learning experience and satisfaction.

2.4 Application of Self-Determination Theory and Cognitive Load Theory in Simulated Classrooms

In simulated classrooms, students' satisfaction is not only affected by teaching content and teaching methods, but also closely related to students' intrinsic motivation and cognitive load. Self-Determination Theory (SDT) was proposed by Deci and Ryan, emphasizing that individual motivation is affected by basic psychological needs such as autonomy, competence and belonging (Deci & Ryan, 1985). In simulated classrooms, when students can gain autonomy in freely choosing interaction methods and participating in classroom design, their intrinsic motivation will be improved, thereby enhancing learning motivation and classroom satisfaction [12].

At the same time, cognitive load theory (CLT) emphasizes the relationship between the complexity of information processing and learning effects. In simulated classrooms, excessive cognitive load will affect students' learning effects, thereby reducing satisfaction. Therefore, in the design of simulated classrooms, it is necessary to arrange learning tasks reasonably and optimize the way of information presentation to reduce students' cognitive load and improve their learning effects and satisfaction.

2.5 Research Gaps and Future Research Directions

Although there have been many studies on simulated classrooms, most of them focus on the discussion of student learning effects and classroom interactions. There are few systematic studies on the satisfaction of simulated classroom teaching, especially the satisfaction of preschool education students in simulated classrooms. By combining self-determination theory and cognitive load theory, further exploring the multidimensional factors that affect the satisfaction of simulated classroom teaching is still a gap in current research. This study will fill this gap and provide empirical evidence and theoretical support for the optimization of simulated classroom teaching by investigating the satisfaction of preschool education students in higher vocational colleges in Beijing.

3. Research Design and Methodology

3.1 Research Paradigm

This study adopts a quantitative research method, aiming to explore the impact of virtual reality (VR) technology on the teaching satisfaction of teachers of preschool education courses in higher vocational colleges in simulated classrooms through empirical research. Quantitative research methods reveal the relationship between variables through systematic data analysis, providing a theoretical basis and empirical support for the application effect of VR technology in preschool education in higher vocational colleges. Through questionnaire surveys and data analysis, this study will deeply explore how different types of VR technology affect teachers' teaching satisfaction through mediating variables such as learning immersion and cognitive load. Quantitative research helps to reveal the causal relationship between variables, thereby ensuring the reliability and universality of the research conclusions [13].

3.2 Data Collection Methods

In order to achieve the research objectives, this study will collect data through a questionnaire survey. The questionnaire will be designed around the satisfaction of teachers of preschool education courses in higher vocational colleges with

simulated classrooms and their reactions after using different types of VR technology[14]. The questionnaire mainly includes four parts: the first part is the evaluation of the types of VR technology applications, including 360° video, interactive VR, immersive VR, etc.; the second part is the measurement of teachers' satisfaction in simulated classrooms, covering dimensions such as learning experience, teaching effect, and classroom interaction; the third part is the teachers' learning immersion in VR classrooms, which is quantified using the Likert scale; the fourth part is the teachers' cognitive load, which measures the cognitive pressure felt by teachers during VR classroom teaching. The questionnaire will be targeted at teachers of preschool education courses in higher vocational colleges, and data collection will be carried out in multiple educational institutions in Beijing to ensure the breadth and representativeness of the sample [15]. It is expected that the questionnaire survey will cover 5 schools, including 2 private schools and 3 public schools, and the research subjects will be 250 teachers. Through this data collection method, this study will be able to obtain sufficient information to analyze how VR technology affects teachers' teaching satisfaction in preschool simulation classrooms .

3.3 Sampling Method and Selection

This study adopts a random sampling method to randomly select professional course teacher samples from 5 higher vocational preschool education institutions in Beijing. The specific school selection criteria are as follows: first, 2 private schools and 3 public schools are selected to ensure the diversity and representativeness of the sample; second, teachers of higher vocational preschool education are selected to ensure the relevance of the research results; third, the sample group should cover teachers of different genders, age groups, teaching years and teaching backgrounds to ensure the broad representativeness of the sample. It is expected that this study will collect valid questionnaire data from a total of 250 teachers from 5 schools. This sample size is sufficient to conduct multiple statistical analyses and draw meaningful conclusions. After data collection, the questionnaire data will be cleaned to eliminate invalid or incomplete answers to ensure the accuracy and validity of the data[16].

3.4 Data Analysis Methods

Two main data analysis software tools will be utilized in this research: SPSS and SmartPLS. First of all, the descriptive statistical analysis, reliability tests, and validity tests will be performed using SPSS in order to check for data reliability as well as measurement tool validity (Judd et al., 2017). Through the application of SPSS, the study will conduct frequency analysis, correlation analysis and multiple regression analysis to test the direct effects of different forms of VR technology, learning immersion, and cognitive load on teacher satisfaction. Secondly, SmartPLS will be utilized to conduct structural equation model (SEM) analysis to test how the independent variable (type of VR technology) affects the dependent variable (preschool education simulation classroom satisfaction) through the mediating variables (learning immersion, cognitive load). With the SmartPLS program, the research will be in a position to establish and test an overall model hypothesis and evaluate the path relation and effect power among variables. Data analysis procedures will include: data preprocessing and cleaning, test of reliability and validity, regression analysis, analysis of structural equation model, etc. to draw accurate and stable research findings [17].

4. Expected Contributions and Limitations

This study aims to fill the gap in the existing literature by exploring the impact of virtual reality (VR) technology on satisfaction with preschool simulation classrooms through empirical analysis. Theoretically, this study will provide a new perspective for the teaching design of preschool simulation classrooms and deepen the understanding of the role of VR technology in education. In practice, the research results provide educators and policymakers with optimization strategies to improve the overall effectiveness of simulation classrooms.

However, this study also has some limitations. Sample size and geographical boundaries may affect the generalizability of the findings. Although questionnaire survey technique may effectively collect data, it is self-reporting in nature and may lead to subjective bias, affecting the accuracy of the findings. Future research can also examine the research conclusions further by expanding the scope of the sample or combining other techniques of research.

5. Conclusion

The study investigated how virtual reality technology may be applied in preschool simulation classrooms and to what degree this may lead to teacher satisfaction. It was established that different uses of VR technology were effective in enhancing teacher satisfaction, especially in the effectiveness in instruction, learning experience of students, and classroom engagement. With VR technology, enhanced overall satisfaction with preschool simulation classrooms is enabled through the mediating variables of immersion in learning and cognitive load.

The limitations of the study include sample size and geographical restrictions, as well as subjective biases that may be caused by questionnaires. Future research can expand the diversity of samples and combine multiple methods such as interviews or behavioral observations to further explore the long-term impact of VR technology in preschool simulation classrooms. At the same time, with the development of VR technology, how to optimize technical design to further improve teacher satisfaction remains a key direction for future research.

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