ISSN 2093-0542

ICONI

KSII KOREAN SOCIETY FOR INTERNET INFORMATION

The 17th International Conference on Internet

(ICONI 2025)

Dec. 14-17, 2025 Okinawa Convention Center, Okinawa, Japan

http://www.iconi.org

Proceedings of ICONI 2025

| Organized by |

Korean Society for Internet Information (KSII)

| Sponsored by |

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Contents

Development of unique career exploration educational content using metaverse-based VR

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Abstract

Current career education relies on one-way, survey-based, or lecture-based approaches, which can make it difficult to engage learners. Due to these limitations, teenagers and college students often do not fully understand the diverse world of careers and struggle to explore their aptitudes and interests.
To address this, we propose an experiential career education model that utilizes virtual reality (VR) technology. Based on VR, we design and implement educational content that allows participants to experience non-mainstream occupations in an immersive environment, often difficult to encounter in real life. Users engage in scenario-based job processes and explore their aptitudes and interests through the experiences that result. Experimental results demonstrate a high level of engagement and improved career awareness among learners, and we anticipate that VR technology will complement the limitations of existing career education.

Keywords: Virtual Reality, Career Exploration Education, Immersive Learning, Non-mainstream Job Experience, Educational Content Development

1. Introduction

Career decisions made by adolescents and college students have a significant impact on the direction of their lives. However, according to a survey by the Korea Research Institute for Vocational Education and Training (2024), approximately 25% of college students reported being unable to clearly decide on their desired occupation, even after choosing a major [1]. This indicates that career education remains a formal process primarily focused on conveying information. To address these issues, the need for experiential career education, where learners can actively participate and indirectly experience actual work environments, is being raised [2]. Virtual reality (VR) technology is attracting attention as an innovative tool for this type of learning [3]. VR maximizes learning effectiveness by stimulating learners' interest through immersion and interactivity, and allowing them to experience abstract concepts concretely [4, 5]. This study examines the

This research was conducted with the support of the Korea Creative Content Agency (Project Name: Artificial Intelligence-Based Interactive Multimodal Interactive Storytelling 3D Scene Authoring Technology Development, Project Number: RS-2023-00227917, Contribution Rate: 100%) and the Korea Research Foundation's four, Brain Korea 21 (Project Name: Ultra-Distributed Autonomous Computing Service Technology Research Team, Project Number: 202003520005).

development process and educational effectiveness of VirtuWork, a VR-based career experience education program developed using Unreal Engine 5.5 and Meta Quest 3. The objectives of this study are as follows. We design VR educational content centered on unique career experiences, enhance the effectiveness of learners' career exploration through immersive learning experiences, and suggest a new direction to overcome the limitations of existing career education [6]. The structure of this paper is as follows. Chapter 2 reviews related work, Chapter 3 presents the proposed method of unique virtual reality-based educational content, and Chapter 4 concludes with future directions.

2. Related Works

Existing career education content typically takes the form of passive information provision, including questionnaires, career introduction videos, and career aptitude tests [3]. This method has limitations in that it is difficult for learners to experience the context of actual work and does not generate interest or immersion. In a case study on the development and operation of a career experience education program utilizing VR content, it was confirmed that learners' interest and learning concentration were improved through VR; however, the experience content was limited to simple explanations [3]. The possibility of metaverse-based career education was suggested through an analysis of the user experience of a high school career experience program utilizing the metaverse. Still, the practical procedures and experience scenario design aspects are insufficient [4]. Accordingly, this study complements the limitations of existing research and applies an interactive scenario design centered on job performance. In addition, by introducing a practical education structure, learners expand their learning experience beyond the stage of ‘knowing about the job’ to the stage of ‘performing the job.’

3. Development of Career Exploration Education Content Through VR-Based Unique Job Experiences

3.1 System Design Overview

This study is designed based on Unreal Engine 5.5, and learners experience the job in a 3D virtual space by wearing the Meta Quest 3 device. The entire system consists of three stages:
Job selection, job performance, and performance feedback.
- The job selection stage, users choose one of several careers and are provided with a basic description and objectives for each career.
- The job performance stage is scenario-based and involves users manipulating actual tools and solving problems..
- In the performance feedback stage, the user's performance results are analyzed to provide job aptitude and feedback.

Fig. 1. System Design Overview

Fig. 1 provides an overview of the system design.

3.2 Educational content design

In this study, other occupations are considered non-mainstream occupations that are realistically difficult to access, and the design focuses on the following three.

a. Pest Control Technician: Experience in improving sanitary conditions and pest control procedures.

b. Animal Wrangler: Experience the animal training and response conditioning process.

c. Jeweler: Experience the Art of Cutting and Polishing Gemstones. Each occupation is designed to reconstruct practical processes through research into actual industrial settings. Learners are guided through step-by-step tasks to understand the value and meaning of their work.

Fig. 2. Animal Wrangler Training Zone

Fig. 2 is the animal wrangler training zone.

Fig. 3. Jeweler

Fig. 3 is a jeweler training zone.

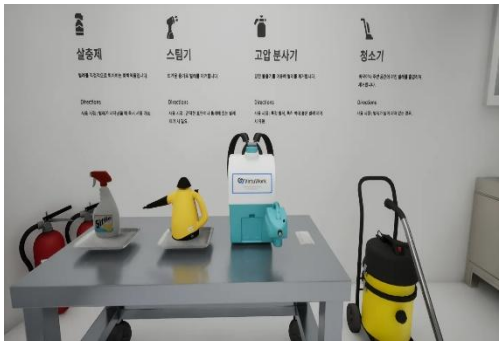

Fig. 4. Pest Control Technician

Fig. 4 is a pest control technician.
Participants in this study responded positively, including "high immersion (90%)," "improved awareness of occupation (85%)," and "helpful in exploring one's aptitude (80%)." According to learner feedback, hands-on VR experiences are more helpful for career exploration than simply watching videos or listening to explanations. Additionally, visual and auditory stimulation improves learners' concentration and increases their willingness to continue learning. Using VR content allows for a more precise understanding of students' career interests and can be easily integrated with existing career counseling programs.

4. Conclusions

This paper aims to develop career experience education content focusing on non-mainstream occupations using VR technology and to assess its educational effectiveness. It encourages learners' active participation and allows them to directly experience the value and meaning of actual work through immersive experiences. This study demonstrates the potential of a realistic career education model that can enhance learners' career interests and self-awareness, improve social perceptions of non-traditional occupations, and be effectively utilized in educational institutions. In future research, we plan to develop a metaverse career education platform tailored to learners through additional developments such as AI-based career recommendation functions, user sentiment analysis, and multi-user collaboration modes.

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