The Evaluation Module of Virtual Reality Simulation for Learner with Intellectual Disabilities: Usability Study

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Abstract

The purpose of this study is to test the usability of the virtual reality (VR) evaluation module. This evaluation module was designed to promote the learning persistence of learners with intellectual disabilities (ID). It consists of three sections: 1) the observation screen that can analyze the learner's learning situation, 2) the evaluation section that can evaluate the learner's performance, 3) the feedback section that can provide the appropriate feedback to the learner when they have in difficulties. After designing the simulation, the heuristic usability test was conducted. Five special education experts and participants in the test were provided with open-ended questions about usability. The questions included the ease of composition of the evaluation module, the criteria for evaluation and the ease of evaluation, the appropriateness of the feedback design, and the ease of providing feedback. Through this, it was possible to confirm the improvement of the evaluation module design for students with intellectual disabilities.

Keywords: virtual simulation intellectual disability, evaluation, scaffolding

Introduction

Vocational education for people with intellectual disabilities (ID) allows for its successful application to future professional life. Characteristics of vocational education for the ID student include task analysis and providing feedback on performance. Vocational tasks presented to learners are divided according to the learner level. In addition, the teacher provides scaffolding in the learners' performance process, to allow them to continue performing the task through evaluation of the learner's task performance during and after the performance. This can be said that vocational education in virtual reality (VR) should also be accompanied by strategies such as task analysis and scaffolding. Therefore, VR simulations for the intellectually disabled should be designed in detail to provide tasks, evaluations, and scaffolding provided. The purpose of this study is to confirm the validity of the evaluation module designed to help the learning continuity of virtual reality vocational education for intellectual disability through expert evaluation. The research problems set for this purpose are as follows; It is to confirm the validity of the simulation design through an expert.

Method

The evaluation module of VR simulation for intellectual disability student

This evaluation module was designed to promote the learning persistence of learners with ID. It comprises three sections: 1) the observation screen that can analyze the learner's learning situation, 2) the evaluation section that can evaluate the learner's performance, 3) the scaffolding section that can provide the appropriate feedback to the learner when they have in difficulties.

Figure 1 Evaluation module

In the simulation to which the evaluation module is applied, the learner enters the simulation with the learner's personal ID. The learner performs the learning task through simulation. Thereafter, the teacher evaluates the learner's learning performance. Learner's learning data generated through evaluation is stored through fire base and then delivered to learners.

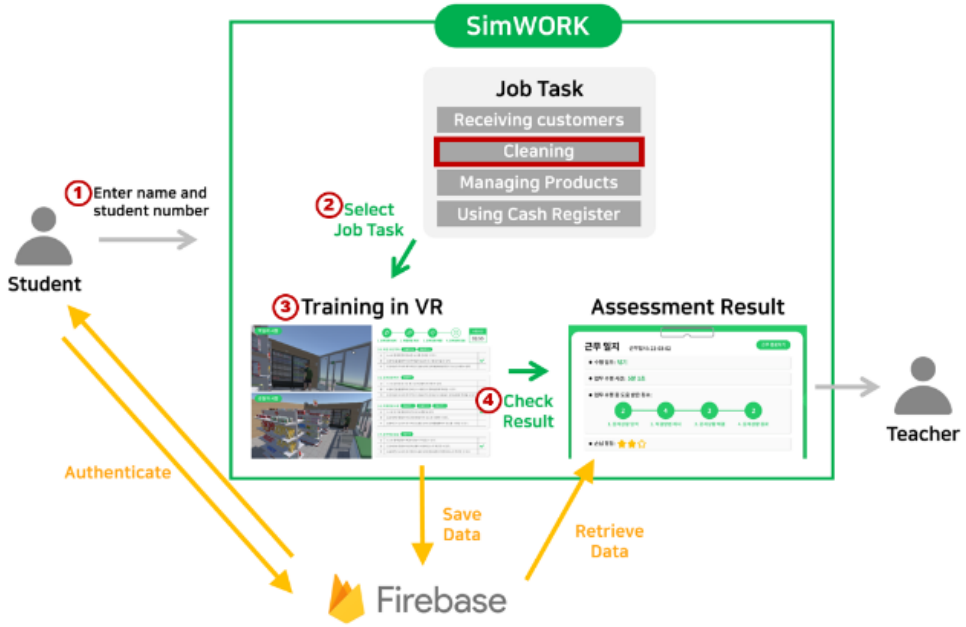

Figure 2 The structure of the evaluation module

Validation analysis

Interviews were conducted to analyze the validity of the evaluation module for four special teachers and one educational engineering expert who had experience teaching students with ID. The interview's

contents were categorized through content analysis. Content analysis is one of the qualitative research methods, and it has the advantage of being able to effectively analyze the meaning of several messages(Kyngäs, 2020).

Result

In general, most experts responded that the composition of the observation screen is not difficult to use and is convenient. In the step-by-step achievement evaluation, experts responded that the evaluation criteria were appropriately organized and were convenient for instructors to use. The suggested scaffolding was also found to be properly configured. However, the buttons configured to provide scaffolding were not found to contain appropriate information for the instructor. The contents of the evaluation result screen provided through the evaluation are appropriate, but opinions on providing additional opinions along with the number of help and horoscopes were presented to help learners understand.

Discussion

The evaluation module developed through the evaluation of five experts was confirmed to be generally well designed in consideration of both instructors and learners. However, it is necessary to design a button for providing scaffolding, the amount of information transmitted on the final result screen, and the implementation method taking the characteristics of each instructor and learner into consideration.

References

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