E-learning System for Vocational Rehabilitation Including a Rehearsal Function for Intellectual Disabilities

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Abstract - This paper develops a vocational rehabilitation system including a rehearsal function for intellectual disabilities. The developed system is composed of vocational rehabilitation content, a user rehearsal function and sensory system that can feedback against the signal. In this study, the system developed will be effective to conduct vocational rehabilitation.

Keywords: E-learning, intellectual disabilities, vocational rehabilitation, E-learning system

1 Introduction

In recent years, modern society has become to obtain information on-line because of the development of IT technology. The development of information transfer units and information technology for accessing information has brought about a change to many parts of modern human life, and this change also had an influence on education. The development of the information transfer unit and information technology have developed the E-learning concept. The advent of E-learning led to a change in the methods of education from an off-line teaching style to an on-line teaching style [1–2], and has provided opportunities for education without being under time and space constraints. Such a change is applied on part of disabilities who need special education and stimulation. However, multimedia software for the disabled is not enough, and currently developed multimedia also has become conspicuous in not considering the characteristics of children with disabilities.

Hye [3] pointed out that it is quite difficult to use educational software with children with intellectual disabilities. He stated that software to be developed mentally retarded children needs to provide a repetitive chances with various items by detailed educational affiliation, after analysis E-learning software what used in special education. Furthermore, it will effectively enable to memorise from. Therefore, this study aims to develop an E-learning system for those with intellectual disabilities that need vocational education that can be providing subdivision category and looking rehearsal.

2 System Design

Three specialists were chosen from special educational teachers, PhD rehabilitation psychology and PhD rehabilitation science and technology candidates for the design of an E-learning system for those that need vocational rehabilitation. The strategy what is deducted through consisted team as in Table 1, consisted of stages so that mentally retarded children can be educated easily. It consists of stages of content to enable repetitive education as confirmed by the educational goal; of education by stages, explanation of the question, modelling education through videos, rehearsal and summarisation as shown in Table 2. Also we considered self-efficacy for intellectual disabilities. Self-efficacy is the belief to possibility of execution and the organisation of the procedure needed to achieve the task and make the decision.

Table 1. Content design strategy

<table>
<thead>
<tr>
<th>Component parts</th>
<th>Design strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text</td>
<td>• Using mono colour on the background for exact information transfer, no glimmering text</td>
</tr>
<tr>
<td></td>
<td>• The size of educational text has to larger than the main title</td>
</tr>
<tr>
<td>Sound</td>
<td>• Sound effects are important for identifying incorrect answers in the ‘Let’s solve’ section</td>
</tr>
<tr>
<td></td>
<td>• There should be similar sound effects in the</td>
</tr>
</tbody>
</table>
### Table 2. Education-step configuration in contents

<table>
<thead>
<tr>
<th>Component name</th>
<th>Configuration description</th>
</tr>
</thead>
</table>
| What would you like to learn? | • Educate about the text what will be educated in subject time  
• Learning content such as a form of scratch card lottery |
| Let’s learn | • Consist of naming, order of use, watching videos and education on safety  
• Showing the order of use separately in stages  
• Modelling education through video |
| Let’s solve | • Solving questions and providing explanations in educated content |

- • Repetitive education of content of what has been learnt by O/X quizzes, choosing one of three items, and listing the order of use; through questions and explanations
- • Let’s make full use
- • Learning through a rehearsal system
- • Let’s summarise
- • Review of the content

A conceptual diagram of vocational education for intellectual disabilities is shown in Figure 1. That rehearsal functions is available to measure student’s behaviour our system through optical sensor and pressure sensor can be detect student’s rehearsal and has been communicated between contents and Bluetooth module.

![Figure 1. Concept of E-learning content](image)

3 System building

The system with the rehearsal function provides a signal through a Bluetooth module from the content to the computer system, and then the computer provides a simulation in response to each signal. At the present time, the computer simulation on offer is departmentalised like in Figure 2. That is an image brought up in a real simulation.

![Figure 2. Subdivision category of E-learning content in the program](image)
The content was designed with a width and height of 210mm, to have the feel of using a real tool and have enough space so a battery on the outside could be easily changed. Figure 1 presents the system concept and Figure 3 is a real picture of the apparatus developed and Table 3 lists the device’s specification.

Figure 3. Developed E-learning device

4 Result

In this study, an effective E-learning system is developed as an E-learning system for intellectual disabilities rather than existing E-learning systems suitable for normal students. In accordance with 3 specialist opinions, we made real size when students take this system. In addition, it is assumed that this system have part of each operation was organised to refine and repeat so if the system is used for a student with intellectual disabilities the education effect will be increased. If the developed system upgrade for design like a real tool, the result of the education is thought to be more helpful in the field of vocational rehabilitation.

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5 References

