A Web-Based Information-Learning-Passport System Using the ARCS Model

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Abstract: The purpose of this study is to develop a passport system based on ARCS model for Internet users to learn basic information technology skills. The system is designed to increase learners’ motivation and use it actively. Due to an assistant learning mechanism, it can improve learners’ information literacy. The learning contents are about information technologies. The styles of the test include multi-choices and practical manipulation tasks. The system automatically evaluates the results, records the process and outcome of the test. The system adopts a role-play strategy, so that users can proceed to the test in the form of games. When a user encounters problems in the test, he/she can find relevant information to assist his/her learning. The main users of the system are teachers and students of junior high schools and elementary schools at Taoyuan County in Taiwan. From December 1999 to June 2001, 1,273,783 users have already used the system.

1: Introduction

The learning motivation is a crucial factor. It may influence how learning gets started and continued, and how students’ motivation can be arisen or maintained. Therefore, if an online test can engage students to use it actively and have high motivation for using it, the achievements will be greatly improved. On the other hand, the common online tests only concern if students can pass the test. They don’t offer the function of learning. But when students encounter problems in the test, they may need instant help. If they can get assistance at once, it’s opportunity for them to learn effectively. This is the first motivation of this study.

The most places which learning take place are schools. However, common online testing systems do not support school operating system. So we will provide functions for teachers to teach and manage their classes easily. This is the second motivation of this study.

Most of the online tests adopt multi-choices, practical tests are seldom used. Although there are many advantages in multi-choices [1], there are many limitations when adopting it as a method to test users. Developing a system that can provide practical manipulation on line is the third motivation of this study.

According to these motivations, the purpose of this study is to develop an information-learning-passport system. The system includes three functions.

1. Increase learners’ learning motivation and improve their learning achievement
2. Combine the operation of classes to understand individual and global information literacy.
3. Provide a practical manipulation test on line

2: Methodology

Learners stand a main role in learning activities. Learning achievements are influenced by learner's motivation and ability. And learning motivation is a key point in learning. Many scholars' researches are about motivation. Keller presents ARCS model, which emphasizes how to motivate one's internal and external factors. In the model, the four factors extend into some practical strategies as follows:

1. Attention: arise learners’ interest and curiosity.
2. Relevance: meet learners’ individual needs and goals, and develop one’s positive learning attitude.
3. Confidence: help learners build confidence and capacity to accomplish the task.
4. Satisfaction: learners can gain internal and external encouragement and rewards by achieving it.

According to the ARCS model, we probe into the model to apply in the information-learning-passport system, show as table 1.

<table>
<thead>
<tr>
<th>Component</th>
<th>Definition</th>
<th>Information-learning-passport design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td>draw learners’ interest and arise his curiosity</td>
<td>Game-oriented interface, role play</td>
</tr>
<tr>
<td>Relevance</td>
<td>meet learners’ individual needs and goals, and develop one’s positive learning attitude</td>
<td>The content is basic skill in the modern computerized society</td>
</tr>
<tr>
<td>Confidence</td>
<td>help learners build confidence and capacity to accomplish the task</td>
<td>Divide the learning targets and provide relevant information</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>learners can gain internal and external encouragement and rewards by achieving it</td>
<td>Awards and Honor Boards</td>
</tr>
</tbody>
</table>

Table 1 the information-learning-passport system mapping to the ARCS model

3: Implementation

The information-learning-passport system is a test system, which is set up on the global information system. The contents of its test are the technique and knowledge for information technologies. The system utilizes stories to play games. The user plays a role to challenge monsters in the game. The testing program is running while users play. When users have problems or
questions, they can find online relevant information to help them learn easily.

The database is the core of the system. Its operation depends on the eight modules, as showed in Figure 1.

The certification module provides user interfaces for users to certificate. The contents of certification are the knowledge and technique of information technologies. If they focus on knowledge, the certification will be multi-choices, which are randomly chosen from database. If they focus on skills, the questions will be the styles of practical manipulation tasks. The system will automatically score after users take the online test.

The reputation module provides the design for awards, Honor Board and Passport Tutors. After passing certification, users can get award and print it out to increase their self-confidence. Those who overcome the challenge and success will be listed on Honor Board once per week. It will encourage users to upgrade and satisfy their own achievement. Those who face difficulty can also get assistance from those who are listed on the Honor Board.

All the processes of the challenge will be recorded when a user proceeds to get certification. It will indicate his outcome in detail about time consuming for getting some sublevels. It also gives some feedback about why the user does not complete his challenge and let users learn from his errors according to the recorded process.

In order to help users get certification easily, the learning module designs three assistant functions. First, it adopts interactive method to provide learning information guidance for users. Secondly, before users go into this system, it will list the requirement of fundamental capability or what kind of knowledge should be understood, the difficulty for every certification item in advance, other average testing frequency, testing time as well. Third, it provides the learning channel. When users encounter problems in the way of certification, in addition to get assistant from “learning file area”, they also get help from Passport Tutors and people who are on the Honor Board.

In statistic data module, there are four kinds of perspectives to show certification result. They are student viewpoint, teacher viewpoint, school viewpoint and local education bureau viewpoint. A student can check his own certification result and understand which place his result is in his grade. A teacher can know every student’s certification status and detail well. For the school viewpoint, it is clear that school official can clearly understand the information skill degree of teachers and students. For the Education Bureau, it can show the data to realize the performance of every school while they promote it as well.

4: Result

The main users of the system are teachers and students of junior high schools and elementary schools at Taoyuan County in Taiwan. From December 1999 to June 2001, 1,273,783 users in total have already used the system, including 15427 teachers and 108356 students. The number of passed users in every level is showed as table 2.

![Table 2 using result of information-learning-passport](image)

Based on the statistic analysis above and interview some teachers and students, we come to the conclusion:

(1) Most students just use computer in their computer class. And few students can surf on the Internet when they go back home.

(2) Most students got into certification program in the computer class. It made the system loading heavy. So it took longer time to make certification.

(3) A few teachers are not aggressive to learn information skill. It may prevent students from participating this program.

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References

