The Intellectual Indicating of the Question in WBT

Makio Fukuda                     Torao Yanaru
Faculty of Human Science            Faculty of Engineering
Osaka International University, JAPAN          Toua University, JAPAN
fukuda@hus.oiu.ac.jp
yanaru@po.cc.toua-u.ac.jp

Back Ground

The e-learning is education used Video-Conference or WBT as a tool. WBT occupies the important position also in e-learning.

It is because it is the method for which WBT does not depend on the learning time or the learning place.

The importance becomes still higher by development of Personal Digital Assistant which has function the video recording and playing.

Most of WBT have adopted the system of the traditional CAI. The courseware which works on PC only moved to up to Web.

The so-called system of "Drill type CAI" is realized by WBT as it is. That is, WBT consists of questions which measure the explanatory note of the study item, and the learner's degree of comprehension.

This is the same structure as traditional CAI. Such structure cannot respond to an individual learner's understanding situation or point in question.

It can be said that this structure of the educational effect to the all learners is not large.

This research solves such a question, obtains the educational effect of WBT, and realizes "Intelligent CAI" corresponding to a learner's individual situation by WBT.

Outline

In order to perform this Intelligent CAI, in WBT, the correlation of an explanatory note and the question is set up beforehand. In process in which the learner advances study, after reading an explanatory note, it answers to the given question.

This method is performed per unit. And a computer evaluates the reply.

The process so far is the same as that of former type CAI.

In this WBT, it is dependent on evaluation of the reply result, and how to advance the following four study ways are set up.
1. When the learner understands very well, the learning system guides the learner to the following chapter.
2. When the learner understands in general, the learning system gives the learner some questions.
3. When the learner does not understand well, the learning system puts up the explanatory note again and gives the question for measuring degree of comprehension to the learner.
4. When the learner hardly understands, the learning system guides the learner to the chapter which can acquire fundamental knowledge.

By including these study ways in WBT, it enables the learner to receive automatically offer of the question according to individual degree of comprehension.

When it is considered that these four study methods are a student's understanding situations, it is expressed as $S_1$ to $S_4$.

The explanatory note of each study chapter is expressed as $C_1, C_2, \cdots, C_n$. The link place of the learning system to the understanding situation in each study chapter is expressed as $L(C_1, S_1) \cdots L(C_n, S_n)$

Table 1: The table of the link place corresponding to the chapter and the understanding situation

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_1$</td>
<td>$L(C_1, S_1)$</td>
<td>$L(C_1, S_2)$</td>
<td>$L(C_1, S_3)$</td>
<td>$L(C_1, S_4)$</td>
</tr>
<tr>
<td>$C_2$</td>
<td>$L(C_2, S_1)$</td>
<td>$L(C_2, S_2)$</td>
<td>$L(C_2, S_3)$</td>
<td>$L(C_2, S_4)$</td>
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<td>\vdots</td>
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</tr>
<tr>
<td>$C_n$</td>
<td>$L(C_n, S_1)$</td>
<td>$L(C_n, S_2)$</td>
<td>$L(C_n, S_3)$</td>
<td>$L(C_n, S_4)$</td>
</tr>
</tbody>
</table>

The link place corresponding to the learner’s understanding situation in each chapter is determined by the logic based on a teacher's education strategy. We tried to make this logic program using the theory of Petrinet. Petrinet is because it is considered the optimal theory for corresponding to an uncertain situation like the learner’s understanding situation.

**Conclusion**

Although we are developing this learning system now, to the learner's understanding situation and the ambiguous portion in instruction, we think that it cannot necessarily respond the optimal. Then, we are under the plan to add the fuzzy theory to this system as next stage of this research.