Correlation of Honey & Mumford Learning Styles and Online Learning media preference

Panarat Sangvigit
Information Technology Program
Graduate School
Sripatum University, Thailand
E-mail: panarat007@yahoo.com

Surasak Mungsing, Ph.D.
Computer Science Program
Faculty of Informatics
Sripatum University, Thailand
E-mail: surasak.mu@spu.ac.th

Anuchai Theeraroungchaisri, Ph.D
Department of Pharmacy Administration
Faculty of Pharmaceutical Sciences
Chulalongkorn University, Thailand
E-mail: anuchai@gmail.com

Abstract

This research provides the strategy in analyzing learning styles in accordance to online learning of learners. The research conduction periods can be classified into 2 phases. The work in the first phase is concerned with the collection of learning style questionnaire as proposed in the theory of Honey & Mumford to be studied, classified through groups learners, explored the similarities or differences of the groups. In the second phase, the researcher employs LMS Moodle in storing learning styles in online learning. The information gained in this phase is obtained through the participation of the learners in each learning activity, frequency rate in joining learning activities, preference in choosing learning activities, and posttest scores of the learners in the lesson. The information obtained in this phase is examined for the relationship with the information collected in the first phase.

There is the low achievement in learners with learning style of Activist and Pragmatist style when text material is used. While, learners in the learning style of Reflector perform high learning achievement when video material is used. As for the Theorist style learners, they have high learning achievement when text material is used. As can be seen, the analysis result obtained in this study is in accordance with the principles of learning styles proposed in Honey & Mumford with the statistically significant value at .05.

Keywords: Adaptive Hypermedia System, Adaptive Educational Hypermedia System, Courseware Engine, Self – direct Learning, Learning Styles, Learner Behavior, e-Learning, Online Learning

1. Introduction

In the consideration of individual learner differences, the factor accepted in the education arena as the crucial element of learner’s success is the activities provided as appropriate to learning styles as stated in Grasha, A., F., and Riechmann,. S. W.[1], Witken, Herman A., R.B. Dyk, H.F. Faterson and other[2], Kolb, D.A[3], and Honey, P., and Mumford,A[4] These scholars emphasize on the importance of learning style and believe that it is the main factor for learning achievement. As such, teachers need to know how to provide learning activities as appropriate to learning styles of the learners.

However, in providing learning activities in accordance to the learning styles of the learners, we need the tool for measuring and classifying preference of individual learners. The tools used nowadays; nevertheless, has many limitations; for example, it depends much on the feeling and emotion of the raters or learners when answering the questionnaire, learners may try to provide the responses as expected by the administration, learners may have lack of motivation in completing the questionnaire, learners may even not realize what their preference in learning actually is, and
the results obtained from the questionnaire can be invalid because the uncertainty of the moods of the learners. In designing online learning with the application of learning style principles, the researcher has employed learning style questionnaire proposed by Honey & Mumford because it is very accordant to online learning. In other word, online learning is the learning that is processed through the self-directed behavior. Hence, the results obtained from this research can be used as the guideline for explaining the relationship between learning behavior altogether with learning style in Honey & Mumford and online learning.

2. Integration A knowledge based architecture on Honey & Mumford Learning Style with Online Learning’s Behavior

According to the previous studies, we found that there are 3 components consisted in adaptive e-learning system which is able to adapt the content suite for the individual learners, there are based on 3 architectures. They are Domain Model, Pedagogical Model and Learner Model. The examples of the systems developed under the scheme mentioned are EDUCE [5] system, NetCoach-Couses [6], and Inspire [7].

The working process of 3 components mentioned leads to the content presentation and learning activities as follows[7].

2.1 Domain Model is the component that collect the content structure. It divides into unit. It can be called in different in each course for example Knowledge Items, Topics, Knowledge Elements, Learning Object, Learning Outcomes [9], etc. However, in divides the content structure like this, the content must be arranged in order such as the prerequisite course in order to increase the ability in adaptation the learning route of the learners through their basic knowledge[10]. In addition, the divides content must be related to the current knowledge of the learners as well so that the learning route of the learners would be appropriate to individual.

2.2 Pedagogical Model is the component that collect the teaching strategies, by adapt learning style that according with the learning styles of individual learners. It provides each learner practice and succeeds the lessons.

As described earlier, this research employs learning materials and activities of Honey & Mumford’s framework. They can be classified into 4 types as follow.[8]

Layer 1: Knowledge Domain is the component that collect the content structure. It divides into unit. However, in divides the content structure like this, the content must be arranged in order such as the prerequisite course in knowledge domain.

Layer 2: Course Structure is the component that collect the teaching strategies. This has to according to the learning styles of individual learners. In this research, the presenter has chosen the learning style by Honey & Mumford’s theory.

As described earlier, this research employs learning materials and activities of Honey & Mumford’s framework. They can be classified into 4 types as follows.

1. Activists: It is the type of learning style that learners love trying right and wrong by themselves. They are impatient and like exploring new things. Also, they are fascinated by showing out activities. In this study, this learning style is tested to the learners by the use of the simulation that gives that learners chance to
get the real experience in learning the lesson of VBA Programming as the details shown in Figure 3.

Figure 3 : Simulation learning material in the lesson of VBA Program

Figure 3 shows some parts of the lesson “VBA Programming” in the topic of “Operator”. Learners can write the program and immediately check the answer with use of button.

2. Reflector : The learners of this style are learned by the observation. They need a lot of information before making any decision or doing activities. Though having highly careful sense, they are opposed to be the leader of the group. Also, they are extremely aware of expressing their opinions. This research tests this style of learning by the use of VDO learning material. Learners can study form it firstly and write the program later as the details provided in Figure 4.

Figure 4 : Video learning material in the lesson of VBA Program

Figure 4 presents some parts of video learning material in the lesson of “VBA Program” in the topic of “Operator”. Learners can press “Play” button whenever they are ready to study and can press “Stop” button when they want to stop video operation.

3. Theorist : These learning style learners always think logically along the theories and rules. They analyze and hypothesize everything with the theories. This research tests this style of learning by the use of text materials so that the learners can consult with the formulae and theories about the lesson as provided in the text. The details are illustrated in Figure 5.

Figure 5 : Text learning material in the lesson of VBA Program

Figure 5 shows some parts of learning text in VBA Programming Lesson in the topic of “Operator”. Learners can draw the text to study as they wish. The content is mainly about principles, structures, and relevant theories.

4. Pragmatists : The learners in this style love to apply the experience to their own task. They care and pay a lot of attention to how the work is done without caring much about the rules and theories. This research tests this style by using “exercise” material as the details shown in Figure 6.
Figure 6: Exercise learning material in the lesson of VBA Program

Figure 6 shows some parts of the exercise in VBA Programming Lesson in the topic of "Operator". Learners can click "Next" to do the next exercise until 10 of them are completed. In addition, learners can also do the exercise without the frequency limitation.

2.3 Learner Model this component is important. Because of it collects the learner’s information to adapt content, adapt learning style, and adapt the user interface according with each individual learning.

3. Methodology

In processing this research, the research divided the process into 2 phases as can be elaborated follows.

Phase 1, the researcher applies the Learning Style Questionair of Honey & Mumford to access the learning style of the learners. The learners who are the samples of this study are the students from Western Rajabhat University in the western part of the country, including, Petchaburi Rajabhat University, Kanchanaburi Rajabhat University, Nakorn Pathom Rajabhat University, and Chombueng Rajabhat University. The number of ~190 samples is obtained from Krejcie& Morgan’s Table which can be elaborated as follows.

Nakorn Pathom Rajabhat University: \( \frac{207 \times 191}{375} = -105 \)

Phetchaburi Rajabhat University: \( \frac{88 \times 191}{375} = -42 \)

Kanchanaburi Rajabhat University: \( \frac{59 \times 191}{375} = -30 \)

Chombueng Rajabhat University: \( \frac{26 \times 191}{375} = -13 \) (19)

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** Information of Academic Support Division of Western Rajabhat University: May 2011

The scope of this research focuses on the study of learning styles of Honey and Mumford and online behaviors. Therefore, the researcher employs the samples reported the clearest 4 types of learning styles as proposed by Honey and Mumford. As a result, the final number of sample obtained is 160.

Phase 2, the researcher employs LMS Moodle and Timestate Block in storing online learning behaviors of the learners as well as the operated time in each activity, activity selection priority, and posttest score. This data is studied for the relationship between online learning and learning styles obtained from Phase 1.

4. Result

Phase 1, This research has 160 students who are the first year students in Business Computer Department of academic year 2011 as the samples in exploring their learning styles of Honey and Mumford. They are from Phetchaburi Rajabhat University, Kanchanaburi Rajabhat University, Nakorn Pathom Rajabhat University, and Chombueng Rajabhat University.

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Rajabhat University</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activists</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Pragmatists</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Reflector</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>Theorist</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 1. The Analysis of Learning Styles Classified by the University

Of the entire 160 students, the learners with the learning style of Activists are 20 (12.50%), with the Pragmatists are 24 (15%), with the Reflector are 86 (53.75%), and with the Theorist are 30 (18.75%).

Phase 2, the researcher uses LMS Moodle and Time state Block for storing operated time of each learning material, activity selection priority, and posttest scores to look at the relationship of online learning and learners styles classification obtained from Phase 1 which can be presented orderly as follows.

1. The comparison of online learning time and learning style of Honey & Mumford
The learners of Pragmatist style consumed average learning time in learning through text with 4.58 minutes, and through simulation with 4.14 minutes.

The learners in Reflector style consumed average learning time on learning through video with 5.02 minutes, through simulation with 4.53 minutes, and through text with 4.34 minutes.

The learners in Theorist style consumed average learning time in learning through the exercise with 8.29 minutes, through text with 6.11 minutes, through video with 5.51 minutes, and through simulation with 5.14 minutes.

2. The analysis of the relationship between learning period and learning achievement of learners with Activist learning style.

<table>
<thead>
<tr>
<th>Media</th>
<th>Average Time</th>
<th>Post test (score)</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation</td>
<td>5.38</td>
<td>8.11</td>
<td>.850</td>
</tr>
<tr>
<td>Video</td>
<td>5.03</td>
<td>8.84</td>
<td>.131</td>
</tr>
<tr>
<td>Text</td>
<td>6.11</td>
<td>7.18</td>
<td>-.751</td>
</tr>
<tr>
<td>Exercise</td>
<td>7.42</td>
<td>8.93</td>
<td>.891</td>
</tr>
</tbody>
</table>

Table 2. presents the relationship between learning period and learning achievement.

The relationship between learning period and learning achievement of learners with Activist learning style shows the correlation value to “simulation” at .850. This indicates that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Video” is at .131 signifying that learning period and learning achievement are lowly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Text” is at -.751 signifying that learning period and learning achievement are opposite.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Exercise” is at .891 signifying that learning period and learning achievement are highly related.

3. The analysis of the relationship between learning period and learning achievement of learners with Pragmatists learning style.

<table>
<thead>
<tr>
<th>Media</th>
<th>Average Time</th>
<th>Post test (score)</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation</td>
<td>6.25</td>
<td>7.69</td>
<td>.432</td>
</tr>
<tr>
<td>Video</td>
<td>4.14</td>
<td>7.91</td>
<td>.519</td>
</tr>
<tr>
<td>Text</td>
<td>4.58</td>
<td>8.14</td>
<td>-.746</td>
</tr>
<tr>
<td>Exercise</td>
<td>7.36</td>
<td>6.96</td>
<td>.474</td>
</tr>
</tbody>
</table>

Table 3. relationship between learning period and learning achievement with Pragmatists learning style.

The relationship between learning period and learning achievement of learners with Pragmatists learning style shows the correlation value to “simulation” at .432. This indicates that learning period and learning achievement are middle related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Video” is at .519 signifying that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Text” is at -.746 signifying that learning period and learning achievement are opposite.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Exercise” is at .474 signifying that learning period and learning achievement are middle related.

4. The analysis of the relationship between learning period and learning achievement of learners with Reflect learning style.

<table>
<thead>
<tr>
<th>Media</th>
<th>Average Time</th>
<th>Post test (score)</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation</td>
<td>5.02</td>
<td>6.76</td>
<td>.534</td>
</tr>
<tr>
<td>Video</td>
<td>3.53</td>
<td>7.91</td>
<td>.796</td>
</tr>
<tr>
<td>Text</td>
<td>4.34</td>
<td>8.23</td>
<td>.524</td>
</tr>
<tr>
<td>Exercise</td>
<td>8.20</td>
<td>8.39</td>
<td>.534</td>
</tr>
</tbody>
</table>

Table 4. relationship between learning period and learning achievement with Reflect learning style.

The relationship between learning period and learning achievement of learners with Pragmatists learning style shows the correlation value to “simulation” at .534. This indicates that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Video” is at .796 signifying that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Text” is at .524 signifying that learning period and learning achievement are lowly related.

Figure 7. comparison of online learning time and learning style of Honey & Mumford

Figure 7 analyzes the learning styles classified through learning material operated time (high to low) shows the information as follows.

The learners of Activist style consumed average time in learning through the exercise with 7.42 minutes, through the text with 6.11 minutes, through the simulation with 5.38 minutes, and through the video with 5.03 minutes.

The learners of Pragmatist style consumed average learning time in learning through text with 6.25 minutes, through video with 4.58 minutes, and through simulation with 4.14 minutes.

The learners in Reflector style consumed average learning time on learning through video with 5.02 minutes, through simulation with 4.53 minutes, and through text with 4.34 minutes.

The learners in Theorist style consumed average learning time in learning through the exercise with 8.29 minutes, through text with 6.11 minutes, through video with 5.51 minutes, and through simulation with 5.14 minutes.

This indicates that learning period and learning achievement are highly related.

Table 2. presents the relationship between learning period and learning achievement of learners with Activist learning style.
Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Text” is at .524 signifying that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Exercise” is at .534 signifying that learning period and learning achievement are lowly related.

5. The analysis of the relationship between learning period and learning achievement of learners with Theorist learning style.

<table>
<thead>
<tr>
<th>Media</th>
<th>Average Time</th>
<th>Post test (score)</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulation</td>
<td>5.14</td>
<td>7.42</td>
<td>.496</td>
</tr>
<tr>
<td>Video</td>
<td>5.51</td>
<td>8.40</td>
<td>.713</td>
</tr>
<tr>
<td>Text</td>
<td>6.11</td>
<td>8.48</td>
<td>.875</td>
</tr>
<tr>
<td>Exercise</td>
<td>8.29</td>
<td>8.34</td>
<td>.793</td>
</tr>
</tbody>
</table>

Table 5. relationship between learning period and learning achievement with Theorist learning style.

The relationship between learning period and learning achievement of learners with Theorist learning style shows the correlation value to “simulation” at .496. This indicates that learning period and learning achievement are middle related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Video” is at .713 signifying that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Text” is at .875 signifying that learning period and learning achievement are highly related.

Regarding the relationship between learning period and learning achievement, it is found that the correlation value to “Exercise” is at .793 signifying that learning period and learning achievement are highly related.

5. Conclusion

The analysis from Phase I and 2 concerning the relationship between learning styles as proposed in Honey & Mumford and online learning can be elaborately described as follows. There is the low achievement in learners with learning style of Activist and Pragmatist style when text material is used. While, learners in the style of Reflector perform high learning achievement when VDO material is used. As for the Theorist style learners, they have high learning achievement when text material is used. As can be seen, the analysis result obtained in this study is in accordance with the principles of learning styles proposed in Honey & Mumford with the statistically significant value at .05.

References


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