1. INTRODUCTION

Since the digital game has become one of the powerful tools for teaching and learning, the digital game has been implemented to improve the learning process. However, due to intensive research in the user learning experience field, there is still a lack of knowledge on how to improve user learning experience [1].

Nowadays, the digital game has become a modern and complex that provides many sources of information. The user learning experience is one of them. The user learning experience provides information through the interaction of the user with the digital game or learning behavior [1]. The game environment provides a discovery task that user can explore (e.g., the goal of the game is completing one mission, and the player needs to explore the game environment). While the game environment offers various information about the user learning behavior, the problem is how this information can be analyzed to improve the user learning experience in a meaningful way [1-3]. For this problem, there is a need for a method that can identify user learning behavior and supplies the results of identification in a meaningful way.

Recently, the researchers have been investigated the method for identification of user behavior using gameplay data. For example, Kang et al. [2] studied user behavior patterns in problem-solving skills in Alien Rescue game. Cheng et al. [1] investigated the gameplay data for improving learning experience using Radix Endeavor games. Rubio Manzano and Trivino [4] studied user behavior using gameplay data in YADY game. Si et al. [3] investigated the user learning behavior through user exploration in StarCraft game. The previous works mostly investigated the user behavior using the general digital game, and they are not explored user behavior in the environment of digital gesture based-game. Furthermore, this work has identified that user behavior can be detected by using human gesture such as a study in [5-7]. These studies demonstrated the way on how detecting user behavior by analyzing human expressions, gesture, and actions. However, these studies were not explored user behavior in the game environment. Therefore, the study of identifying user learning behavior in the environment of digital gesture based-game has not yet explored.

Moreover, another way for an understanding of user learning experience is through student learning styles area. In general, the student learns various styles. Therefore, understanding how the student learns is highly challenging, especially, in-game environment. Mostly, understanding the student learning process used traditional approaches such as survey, interview, observation, and paper assessments [8]. The serious weakness of the traditional approach is the student not always motivated to answer the assessments. Therefore, the student may give an incorrect answer or bias data. Also, the traditional method such as interview and observation need time and effort during a long period so that these methods are not efficient for the student.

Many researchers have been investigated student learning styles used machine learning technique for identifying
the student learning styles. They tracked the information of student when interacting with the educational environment such as web-based course or online course [9-11]. Also, this work identified that only one study investigated student learning style using the digital game, as proposed by Feldman [8]. Although previous studies have proposed the promising way of identifying student learning styles, the limitation can be found. Mostly, the previous studies used an online course where this environment need to provide a large amount of student information in multiple formats. This environment has to provide many and repetitive assignments so that the student is not motivated and encouraged to take an online course. Therefore, based on the limitation of previous works, there is a need for a new method that can automatically identify student learning styles without disturbing the learning process. The method that can encourage and increase the motivation of student in learning so the student learning style can be easily identified. This study argues that the game is a promising tool which can encourage student learning process and helps for identification learning styles (for the next, student called “user” in this paper).

In summary, the limitation of the previous works is presented, as follows:

- There is a lack of knowledge about how to improve the user learning experience.
- There is a problem how to analyze the user learning behavior in a meaningful way.
- The study of identifying user learning behavior in the environment of digital gesture based-game has not yet explored.
- There is a limitation in the traditional approach for identifying the user learning styles.

For these problems, the goal of this study is to present a method using gameplay data and examine the possibility environment of the digital gesture-based game for identifying user learning experience. This study proposed the Granular Linguistic Model of a Phenomenon (GLMP) for identifying user learning experience namely, user learning behavior and user learning styles. For the sake of simplicity, this work has studied on the digital gesture based-game focus on user hand gesture and one dimension of Felder Silverman’s learning styles namely perception style [12].

The structure of the work is organized as follows: Section 1 presents the background and the goal. Section 2 introduces the proposed model. Section 3 explains the details of the model. Section 4 describes the method and result. Section 5 provides a discussion. Finally, section 6 explains the conclusions and future works.

2. PROPOSED MODEL

This section presents the model for identifying user learning behavior and perception styles. The goal is to create computational perception and generate the results in natural language expressions. The model uses the computational theory of perception namely Granular Linguistic Model of a Phenomenon (GLMP) [13]. Two GLMP model is developed: GLMP1 for user learning behavior and GLMP2 for user perceptions styles. Figure 1 shows the model. The explanation is presented as follows:

- a) User: the player who plays the game.
- b) Gameplay Metrics: This module collects player data during interaction in the game. In this step, the user data is divided into behavior data and perception data. In behavior data, user gameplay data such as duration, accuracy, the result are collected. In perception data, duration, result, and routes are collected.
- c) Proposed Model: GLMP is a rule-based theory of perception (see Appendix A). In this model, the designer creates computational perceptions based on his/her perception (see Figure 4).
- d) Summary: The final step presents the results of model: (i) user ability, attitude, skill, and movement as evidence of user learning behavior; and (ii) user perception styles: intuitive, neutral, sensitive.

![Figure 1: Proposed Model.](image-url)
3. DETAILS OF MODEL

This section presents the architecture of GLMP that is divided into two parts GLMP1 and GLMP2. The game designer develops the GLMP model based on his/her perception with consideration what gameplay metrics that can be used to collect data and shows the evidence of user behavior and perception styles. In Figure 4, the design of architecture is divided into four layers. The first layer: gameplay metrics; the second layer: first-order computational perceptions (1CP); the third layer: second-order computational perceptions (2CP); the final layer: the results of identification of user behavior and perception styles.

3.1 First-order CP (1CP)

In the first layer, gameplay metrics collects the user data. Gameplay metrics are log-duration (duration user playing the game), log-accuracy (accuracy of user hand movement), log-result (the result of player in the game) and log-routes (the result of how many routes that user do in the game). In 1CP, the input is numerical data. The design of 1CP is presented as follows:

3.1.1 1CP of duration

1CP-duration is the duration user playing the game. The log-duration records the play duration in minutes. 1CP duration is measured starting from the user playing the game until the finish. 1CP-duration is a tuple (x, y, g)

\[ g = \text{output function } W_g \text{ that calculates the validity degree of the output } 1CP-duration \text{ and is obtained by an aggregate function of Fuzzy logic partition (see Figure 2). The linguistic labels of } A_e \text{ are defined by rules as follows: if } (accuracy = ((0, 1.5) - (20, 1.5))) \text{ then } \text{accurate}; \]

\[ \text{if } (accuracy = ((1.5, 3) - (20, 3))) \text{ then } \text{proper} \text{ else inaccurate}. \]

3.1.2 1CP of accuracy

1CP-accuracy is the accuracy of user hand movement while playing the game. The log-accuracy records the user hand movement. The accuracy is measured by the calculated coordinate point (x, y) of the hand positions. A safe zone is set (x and y in Cartesian coordinate). When the hand movement is outside of the safe zone, the user creates inaccurate movement. 1CP-accuracy is a tuple (x, y, g) and is defined as follows:

\[ g = \text{output function } W_y \text{ that calculates the validity degree of the output } 1CP-accuracy \text{ and is obtained by an aggregate function of Fuzzy logic partition (see Figure 3). The linguistic labels of } A_y \text{ are defined by rules as follows: if } (accuracy = ((0, 1.5) - (20, 1.5))) \text{ then } \text{accurate}; \]

\[ \text{if } (accuracy = ((1.5, 3) - (20, 3))) \text{ then } \text{proper} \text{ else inaccurate}. \]

3.1.3 1CP of result

1CP-result is the result of the user in the game. The log-result collects the user data. 1CP-result is a tuple (x, y, g) and is defined as follows:

\[ g = \text{output function } W_y \text{ that calculates the validity degree of the output } 1CP-result \text{ and is obtained by an aggregate function of Fuzzy logic partition (see Figure 3). The linguistic labels of } A_y \text{ are defined by rules as follows: if } (accuracy = ((0, 1.5) - (20, 1.5))) \text{ then } \text{accurate}; \]

\[ \text{if } (accuracy = ((1.5, 3) - (20, 3))) \text{ then } \text{proper} \text{ else inaccurate}. \]

3.1.4 1CP of routes

1CP-routes is the result of how many routes (e.g., hand movement tracking to move duck/fox/seeds from one shore to another shore) that user has done in the game. The log-routes collects the user data. 1CP-routes is a tuple (x, y, g) and is defined as follows:
$x$ is the total routes in the game
$y$ is the output $1CP\text{-}routes = (A_y, W_y)$,
where $A_y = \{\text{good, moderate, bad}\}$
$g$ is the output function $W_y$ obtained by an aggregate of the routes in the game. The linguistic labels are defined by rules as follows: if (routes ≤ 7) then good; if (routes ≥ 8 and routes ≤ 9) then moderate else bad. Average routes of all participants are used as basic knowledge for designing the rules.

3.2 Second-order CP (2CP GLMP1)

The second-order computational perceptions (2CP) are calculated based on subordinate 1CP. This computational perception presents the interpretation of user learning behavior. In this 2CP, the rule-based is used (see Appendix A). For instance, 2CP of skill is examined by 1CP-result and 2CP-movement. The result is divided into advanced, high intermediate, basic and beginner. The user skill is advanced; if the result (1CP of result) is good and movement (2CP-movement) is very fast.

3.2.2 2CP of Skill

2CP of skill examines the user skill. 2CP-skill is achieved by combining 1CP-result and 2CP-movement. 2CP-skill is a tuple $(u, y, g)$ as follows:
$u$ is the input of 1CP-result and 2CP-movement
$y$ is the output $2CP\text{-}skill = (A_y, W_y)$,
where $A_y = \{\text{advance, high intermediate, basic, beginner}\}$
$g$ is the output function $W_y$ obtained by an aggregate of the set of Fuzzy rules in Appendix A

3.2.3 2CP of Attitude

2CP of attitude examines the user attitude. 2CP-attitude is achieved by combining 1CP-accuracy and 2CP-movement. 2CP-attitude is a tuple $(u, y, g)$ as follows:
$u$ is the input of 1CP-accuracy and 2CP-movement
$y$ is the output $2CP\text{-}attitude = (A_y, W_y)$,
where $A_y = \{\text{brave, wise, cautious, careless}\}$
$g$ is the output function $W_y$ obtained by an aggregate of the set of Fuzzy rules in Appendix A

3.2.4 2CP of Ability

2CP of ability examines the user ability. 2CP-ability is achieved by combining 2CP-skill and 2CP-attitude. 2CP-ability is a tuple $(u, y, g)$ as follows:
$u$ is the input of 2CP-skill and 2CP-attitude
$y$ is the output $2CP\text{-}ability = (A_y, W_y)$,
where $A_y = \{\text{very skillful, skillful, low skillful, improvable}\}$
$g$ is the output function $W_y$ obtained by an aggregate of the set of Fuzzy rules in Appendix A
3.3 Second-order CP (2CP GLMP2)

This section presents the model for identifying user perception style. The rule-based is used to identify the perceptions styles namely intuitive, neutral and sensitive. The computational perception is designed based on the meaning of sensitive, neutral and intuitive learners [12]: sensitive likes facts, data, and experimentation. On the other side, the intuitive prefers theory and likes complex problems. The intuitive is expected who have creative thinking and will get a good result in the game. Also, an intuitive user who prefers to solve difficult problems and would play longer with many routes in the game. In contrast, sensitive who prefers to solve the game problem using standard methods and do not like complications. Sensitive user likes to play in short duration, a few routes and gets a bad result. Further, neutral is in the moderate position between sensitive and intuitive. Therefore, based on that perception, the computational perception and rule-based (detail rules in Appendix A) is proposed:

3.3.1 2CP of Sensitive

2CP of sensitive examines the sensitive user. 2CP-sensitive is achieved by combining 1CP-duration, 1CP-routes, and 1CP-result. 2CP-sensitive is a tuple \((u, y, g)\) as follows:

- \(u\) is the input of 1CP-duration, 1CP-routes, and 1CP-result
- \(y\) is the output 2CP-sensitive = \((A_\mu, W_y)\), where \(A_\mu = (\text{sensitive}, \text{neutral}, \text{intuitive})\)
- \(g\) is the output function \(W_y\) obtained by an aggregate of the set of Fuzzy rules in Appendix A

3.3.2 2CP of Neutral

2CP of neutral examines the neutral user. 2CP-neutral is achieved by combining 1CP-duration, 1CP-routes, and 1CP-result. 2CP-neutral is a tuple \((u, y, g)\) as follows:

- \(u\) is the input of 1CP-duration, 1CP-routes, and 1CP-result
- \(y\) is the output 2CP-neutral = \((A_\mu, W_y)\), where \(A_\mu = (\text{sensitive}, \text{neutral}, \text{intuitive})\)
- \(g\) is the output function \(W_y\) obtained by an aggregate of the set of Fuzzy rules in Appendix A

3.3.3 2CP of Intuitive

2CP of intuitive examines the intuitive user. 2CP-intuitive is achieved by combining 1CP-duration, 1CP-routes, and 1CP-result. 2CP-intuitive is a tuple \((u, y, g)\) as follows:

- \(u\) is the input of 1CP-duration, 1CP-routes, and 1CP-result
- \(y\) is the output 2CP-intuitive = \((A_\mu, W_y)\), where \(A_\mu = (\text{sensitive}, \text{neutral}, \text{intuitive})\)
- \(g\) is the output function \(W_y\) obtained by an aggregate of the set of Fuzzy rules in Appendix A

3.4 The result (linguistic summary)

The final layer is the results of identification GLMP1 and GLMP2. The formula \(\Sigma\text{CP}\) is used. The result is created based on the rule of “If X and Y then Z.” X and Y is the linguistic label of reason, and Z is the linguistic label of the result. For instance, the rule of user learning behavior is obtained by \(\Sigma\text{CP-attitude} = \text{if } 1\text{CP-accuracy (accurate) and } 2\text{CP-movement (very fast) then wise. Thus, the CP-attitude is wise. Similarly, the rule for identifying user perception styles is obtained by } \Sigma\text{CP-Perception} = \text{if } 1\text{CP-duration (short) and } 1\text{CP-routes (many) and } 1\text{CP-result (bad) then sensitive.}

4. METHOD AND RESULT

4.1 Method

The total of 11 participants was used. The university’s students with various backgrounds were used because this study assumed that perception styles could be identified with different characteristics. The limited number of participants were chosen because the goal of this study was exploring the possibility of a method for identifying user learning experience in an environment digital gesture based-game. User hand movement gesture was used. Free kinems learning game was used because the game has characteristics of problem-solving skill that needs creative thinking, perception and also provided the way for identification of user learning behavior. In this game, the participants have performed the task to bring a boat (using hand gesture) in a river and transfer a duck, a fox and a sack of seeds from one shore to the other shore. The rules were the duck should not be forsaken with the seeds or the duck with the fox at the same shore (see Figure 5).

4.2 Procedure Collecting and Analyzing Data

The collecting data was performed using two ways, gameplay metrics in Kinems learning game and using Index of Learning Styles (ILS) [14]. The participants were played the Free Kinems learning game around 15 minutes. The participants were not given information about the

Figure 5: Kinems Game
goal of the experiment. The gameplay metric collected the data during user playing the game. After playing the game, the participants were asked to complete the ILS questionnaire online [14]. Furthermore, GLMP1 and GLMP2 analyzed the data from gameplay metrics to obtain the results of identification. Finally, the results of GLMP2 and ILS questionnaire were compared to examine the different results between these two methods.

4.3 Results
The GLMP model presents two results. GLMP1 presents the identification of user behavior namely movement, skill, attitude, and ability. Table 1 shows all user learning behavior. In Table 1, all user learning behavior can be identified. Furthermore, in Table 2, the results of the ILS questionnaire online and GLMP2 were compared. The result was showed that ILS questionnaire and GLMP2 were matched in user 2 and 4. Contrary, the GLMP2 was not matched in other users. The result of ILS questionnaire was different with GLMP2 because of the rule-based perception (see Appendix A rule for CP-perception). The rule-based stated that intuitive user who play longer, many routes, and good results whereas the sensitive user who play shorter, a few routes and bad result. However, the findings showed significantly different results except for user 2 and 4 (see Table 2). User 1, 3, 5, 6, 8, 9 and 11 was obtained short duration, a few routes and good results that are significantly different with our rule-based and our hypothesis (see Section 3.3 and Appendix A rule for GLMP2 analyzed the data from gameplay metrics to obtain the results of identification. Finally, the results of GLMP2 and ILS questionnaire were compared to examine the different results between these two methods.

4.3 Results
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5. DISCUSSIONS
This study has presented a method for identifying user learning experience namely user learning behavior and user perception styles. The result shows that the digital gesture based-game can be used as an environment for an understanding of user learning experience. While there is a study that has investigated user learning experience, none of them has explored in the area of digital gesture based-game environment. In such a way, this study presents contributions by introducing a simple and low-cost method using the digital gesture based-game environment for exploring user learning experience. The GLMP1 have used similarly to the model proposed by Rubio Manzano et al. [4]. They found that user behavior can be identified in the 2D game environment. Similarly, this study identified that user learning behavior could be identified in digital gesture based-game environment.

Furthermore, in the user perception styles (GLMP2), this work identified the different result of accuracy for identifying the perception styles as compared to the previous study by Feldman et al. [8]. Those previous works [8] was obtained 85.1% accuracy, and our proposed method was obtained 18% accuracy. The significant difference accuracy between previous work [8] and our GLMP2 method occurred because of several reasons. The GLMP2 method used a limited number of variables (three variables), and previous work [8] used four variables so that there is a different result of accuracy (see in Table 3). Then, previous work [8] was studied perception styles in a 2D puzzle game whereas our study used the digital gesture-based game (hand gesture controller), different context of the game.

GLMP2 models were designed based on the designer’s perception to identify intuitive, neutral and sensitive users. There is need a strict validation about what is the features of intuitive, neutral and sensitive users before designing


<table>
<thead>
<tr>
<th>User Learning Behavior</th>
<th>Movement</th>
<th>Skill</th>
<th>Attitude</th>
<th>Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>User 1</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
<tr>
<td>User 2</td>
<td>Slow</td>
<td>High-intermediate</td>
<td>Cautious</td>
<td>Low skillful</td>
</tr>
<tr>
<td>User 3</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
<tr>
<td>User 4</td>
<td>Slow</td>
<td>High-intermediate</td>
<td>Cautious</td>
<td>Low skillful</td>
</tr>
<tr>
<td>User 5</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
<tr>
<td>User 6</td>
<td>Fast</td>
<td>Advance</td>
<td>Careless</td>
<td>Skillful</td>
</tr>
<tr>
<td>User 7</td>
<td>Very slow</td>
<td>Beginner</td>
<td>Careless</td>
<td>Improvable</td>
</tr>
<tr>
<td>User 8</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
<tr>
<td>User 9</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
<tr>
<td>User 10</td>
<td>Very slow</td>
<td>Beginner</td>
<td>Careless</td>
<td>Improvable</td>
</tr>
<tr>
<td>User 11</td>
<td>Very fast</td>
<td>Advance</td>
<td>Wise</td>
<td>Very Skillful</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>User Perception Styles</th>
<th>ILS Questionnaire</th>
<th>Duration</th>
<th>Routes</th>
<th>Results</th>
<th>GLMP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>User 1</td>
<td>Sensitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 2</td>
<td>Intuitive</td>
<td>Long</td>
<td>Many</td>
<td>Good</td>
<td>Intuitive</td>
</tr>
<tr>
<td>User 3</td>
<td>Intuitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 4</td>
<td>Intuitive</td>
<td>Long</td>
<td>Many</td>
<td>Good</td>
<td>Intuitive</td>
</tr>
<tr>
<td>User 5</td>
<td>Intuitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 6</td>
<td>Sensitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 7</td>
<td>Intuitive</td>
<td>Moderate</td>
<td>Many</td>
<td>Bad</td>
<td>Sensitive</td>
</tr>
<tr>
<td>User 8</td>
<td>Intuitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 9</td>
<td>Sensitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
<tr>
<td>User 10</td>
<td>Intuitive</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Bad</td>
<td>Sensitive</td>
</tr>
<tr>
<td>User 11</td>
<td>Sensitive</td>
<td>Short</td>
<td>A few</td>
<td>Good</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Previous work [8]</th>
<th>Our proposed method GLMP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result: represents the results obtained by the student in each level played.</td>
<td>Result: is the result of the user in the game.</td>
</tr>
<tr>
<td>Time: represents the average time elapsed to finish a level.</td>
<td>Time: represents the average time elapsed to finish a level.</td>
</tr>
<tr>
<td>Level: is the maximum level reached by the student.</td>
<td>Level: is the maximum level reached by the student.</td>
</tr>
</tbody>
</table>

98
Using Gameplay Data for Identifying User’s Learning Experience in an Environment of Digital Gesture Based-game

6. CONCLUSIONS AND FUTURE WORKS

This study has presented the method for identifying user learning experience in an environment of the digital gesture-based game using gameplay data. The digital gesture-based game can be used as an environment for identifying user learning experience. The results showed that the GLMP1 method is worthy to identify user learning behavior and GLMP2 method offers 18% accuracy to identify user learning style. Thus, two proposed methods have the potential for identifying user learning experience in the environment of digital gesture-based game and another environment of digital games.

The extent of this work has opened the possible direction of work in the area of the understanding user learning experience. As future studies, it would be a benefit to improve the design of GLMP model, increasing the number of participants, a study on other human’s gesture, other game platforms, different age and gender, another dimension of learning styles and learning behavior. Also, the future work should consider the questions from ILS questionnaire [14] as knowledge for designing variables of GLMP2 method and consider the validation of variables before designing the model.

As a further contribution, this study presents the possible variables for identifying perception styles that can be used as a recommendation for designing GLMP2 model (see Appendix B). Finally, this study hopes to inspire future studies in the direction of work.

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Appendix A: The rule-based
https://drive.google.com/file/d/10PavxXluEMtUDJsBw5uVckFmXr3EPZay/view?usp=sharing

Appendix B: The possible variables for future studies

<table>
<thead>
<tr>
<th>Intuitive Possible Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solving the problem using innovative ways</td>
</tr>
<tr>
<td>Play in long time</td>
</tr>
<tr>
<td>Get good results in the game</td>
</tr>
<tr>
<td>Prefer to solve the complex problem</td>
</tr>
<tr>
<td>Prefer play game more</td>
</tr>
<tr>
<td>Creative</td>
</tr>
<tr>
<td>Level Game level: Intuitiveuser tends to get the good result, so he/she tends to play and reach the maximum level of the game.</td>
</tr>
<tr>
<td>Sensitive Possible Variables</td>
</tr>
<tr>
<td>Solving the problem using standard ways and doesn’t like a complex problem</td>
</tr>
<tr>
<td>Play in less time</td>
</tr>
<tr>
<td>Get bad results in the game</td>
</tr>
<tr>
<td>Prefer to solve an easy problem</td>
</tr>
<tr>
<td>Prefer easy problems</td>
</tr>
<tr>
<td>Low performance</td>
</tr>
<tr>
<td>Level Game level: Sensitive user tends to get the bad result so he/she may not reach the maximum level of the game.</td>
</tr>
<tr>
<td>Consider the questions from ILS questionnaire [14] as basic knowledge for designing GLMP2 variables.</td>
</tr>
</tbody>
</table>

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