Needs Analysis Based on Student’s Perspective of Learning Difficulties in Geometry

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**KEYWORDS**
- Learning difficulties
- Geometry
- Circles
- Visualization

**ABSTRACT**
This paper investigates the learning difficulties among students’ in Geometry. Then, the objective of this paper is to explore the needs analysis from students’ perspectives in terms of learning difficulty. To achieve this, the researcher applied the survey research through questionnaire method. From the findings, it is obvious to find that learning difficulties particularly in visualization occurred among students in the topic of Circles. From this results, it can be concluded that the needs of pedagogical teaching approach to overcoming learning difficulty among secondary school students.

1. Introduction
Geometry is one of the components in mathematics secondary school curriculum that need to be mastered by students [1]. About forty per cent of the forty two topics are taught in secondary school curriculum which includes Geometry [2]. One of the reasons because Geometry is an integrative theme containing a robust source of visualization for mathematical concepts [3]. However, the traditional teaching and learning approached often emphasize on having students to memorize list of definitions and properties of Geometry in the classroom [4]. In short, students are often misguided by this focus and caused difficulties in learning Geometry particularly in the topic of Circles. There is a popular model which is called van Hiele Model of geometry thinking that has been proposed by Dina van Hiele-Geldof and Pierre van Hiele. Many mathematics educators associate this model with the pedagogical of teaching and learning in classroom [5]. They have identified five different levels of thinking which students must progress sequentially from one level to the next level of thinking without skipping any one level [1]. Thus, in this paper will only discuss the needs analysis from students’ perspective in terms of learning difficulties in Geometry topics.

2. Experimental procedure
In this part, the information gathered from students was collected and analyzed by the researcher to affirm this study. Through document analysis, the researcher obtained data findings referenced by the previous scholar’s findings that related to the researcher’s study which was related to the learning difficulties faced by students. The information was collected by using questionnaire (refer Table 1). The study was conducted in one of the secondary schools in Pasir Gudang, Johor, Malaysia. Sixty participants were involved in answering questionnaire. Participants who were involved in this study have been granted with the consent of the principal of the school.

3. Results and discussion
Table 1 indicates participants’ responses. A group of participants who were surveyed found that they were not clear in the axis of symmetry of a circle, the chord and the arc properties. In fact, neither they cannot imagine the relationship between angles in a circle nor see the relationship between angles in a circle. On top of that, they had problems identify the relationship of the interior opposite angles in a cyclic quadrilateral. Thus, the Malaysian Examinations Syndicate (LPM) also suggested to the teacher to diversify the use in the practice of teaching and learning [6]. From the information and analysis done by the researcher it can be conclude that students’ found difficult to learn this topic. This is in line with the findings of the TIMSS 2011 where two Malaysian students perform poorly in Geometry components [7].
4. Conclusion

This study provides evidence that students’ learning difficulty in Geometry (on Circles, in particular) do happened among secondary school students. In general, it is expected that the findings of this small scale research will benefit teachers and researchers in performing more meaningful and effective ways of learning Geometry.

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Reference


Table 1: Students’ opinion in the learning of topic Circles

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>SD</th>
<th>D</th>
<th>LA</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>The contents of a topic should be organized systematically to facilitate my learning.</td>
<td>10</td>
<td>10.0</td>
<td>9</td>
<td>15.0</td>
<td>19</td>
<td>31.7</td>
</tr>
<tr>
<td>I am less clear about the axis of symmetry of a circle.</td>
<td>8</td>
<td>13.3</td>
<td>8</td>
<td>13.3</td>
<td>12</td>
<td>20.0</td>
</tr>
<tr>
<td>I can not imagine the relationship between angles in a circle.</td>
<td>6</td>
<td>10.0</td>
<td>4</td>
<td>6.7</td>
<td>7</td>
<td>11.7</td>
</tr>
<tr>
<td>I can identify the relationship of interior opposite angle in a cyclic quadrilateral.</td>
<td>24</td>
<td>40.0</td>
<td>6</td>
<td>10.0</td>
<td>13</td>
<td>21.7</td>
</tr>
</tbody>
</table>

*SD – Strongly disagree, D – Disagree, LA – Less Agree, A – Agree, SA – Strongly agree