Effect of Flipped Learning and Think Pair Share Strategy on the Students’ Performance in Physics

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Abstract.
Flipped learning and Think Pair Share is a learning strategy that requires students to interact. This study sought to find out the effect of Flipped learning and Think Pair Share strategy on the performance in Physics of grade 12-STEM students. The research employed a true experimental methodology, specifically employing the pretest – postest control group design. Percentage, T-Test, and Paired T-Test were used for the analysis of the data. T-test showed no significance difference in the pretest score in Physics of the students exposed to Flipped learning and Think Pair Share strategy and lecture method. T-test result showed significance difference on the posttest score in Physics when exposed to Flipped learning and Think Pair Share strategy and lecture method as shown in the t-value of (4.9971) that correspond to the p-value of (5.68E-06). Paired t-test revealed that there was a significant difference on the students’ pretest and posttest scores in Physics when exposed to Flipped learning and Think Pair Share Strategy as shown in the p-value of 3.3E-16 and Lecture method as shown in the p-value of 2.26E-07. The result reveals that Flipped learning and Think Pair Share strategy are effective in enhancing students’ performance in Physics.

Keywords—Flipped learning, Think Pair Share, performance, experimental group, control group, lecture method.

INTRODUCTION
Strategy is a plan of actions that one use to formulate goals and objectives and the means of achieving these goals and objectives (Athapaththu, 2016). So, it can be concluded that a strategy is a plan to make the goal achieved by something that has been prepared. In teaching speaking, strategies are much needed. Imanika (2021) said that strategies are essential since they provide foreign language learners with valuable tools to communicate in the target language diverse situation. Strategy is generally used for achieving something. In teaching speaking, strategy means the way to make the speaking, or the communication goes well as the goal. Think Pair Share Strategy is one cooperative learning strategy that requires students to interact with their partners by sharing individual ideas in solution after a period of individual think time. The think pair share strategy is designed to differentiate instruction by providing students time and structure for thinking on a given worksheets, enabling them to formulate individual ideas and share these ideas with a partner (Kagan, 1998). This learning strategy stimulates classroom interaction by encouraging of students’ response, rather than using a traditional method in which a teacher poses a question and one student offers a response, additionally, this strategy provides an opportunity for all students to share their thinking with at least one other. In this method, a problem is posed, students have time to think about it individually, and then they work in pairs to solve the problem and share ideas with class (Baumeister, 1992). A current trend in the education community has teachers flipping out across the nation. This trend is known as the “flipped classroom” or “inverted classroom.” In traditional educational classrooms, the learning process starts from the instructor to the student. During this process, many different teaching techniques can take place. Such as teamwork, think pair and share…etc. The use of the flipped learning has the potential to be an effective and beneficial method of education. A flipped classroom is comes from the idea that lecture or direct instruction is not the best use of class time. Instead students make the learning before class, which free the time class and more time for activities that includes critical thinking. With the use of flipped classroom students were able to learned on their own through activities. Constructivist learning takes place when students gain knowledge through direct personal experiences such as activities, projects, and discussions. (Ultañir, 2012). Collaborative learning takes place when two or more people learn something together, holding one another accountable for their learning (Roberts, 2004). Collaborative learning can create...
students who are more invested in their own learning, desiring to succeed in order to meet the expectations of one’s peers (Roberts, 2004).

MATERIAL AND METHODS
The participants of the study were the 60 grade 12 students at St. Paul’s Institute of Iligan City, Inc., Santiago, Iligan City, Philippines. The study used the true experimental research design, the randomized pretest-posttest control group design. Two (2) groups were involved in the study wherein the 30 students were exposed using Flipped learning and Think Pair Share strategy and the 30 students for the Lecture Method respectively. The experimental group will follow the cycle that may start from asking, investigate, create, discuss, and reflect while the lecture method group will be under the discussion of the teacher. The performance of the students was measured through pretest and posttest. The pretest and posttest questionnaires were composed of thirty (30) items multiple choice. In the conduct of the study, sending of letter requesting the approval from the office of the principal of St. Paul’s Institute of Iligan City, Inc. to conduct the study. Sending letter of request to Grade 12 students as participants and secure the participant and parents’ consent form was also considered.

RESULT AND DISCUSSION
Table 1 shows the difference between the students’ pretest scores in Physics when grouped using Flipped learning and Think Pair Share strategy and lecture method. The data show that there is no significant difference between the pretest scores in Physics when grouped using Flipped learning and Think Pair Share strategy and lecture method as shown in their t-value of (0.6111) that corresponds to the p-value of (0.5437). And that the null hypothesis is accepted. This means that the two groups are comparable to each other.

Table 1. Independent t-test result showing the difference between the pretest scores of the two groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean score</th>
<th>Mean Difference</th>
<th>T-value</th>
<th>P-value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest Strategy</td>
<td>30</td>
<td>9.17</td>
<td>0.3</td>
<td>0.6111</td>
<td>0.5437</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Lecture Method</td>
<td>30</td>
<td>9.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With 0.05 level of significance

Table 2 shows the difference between the students’ posttest scores in Physics when exposed using Flipped Learning and Think Pair Share strategy and lecture method. The data show that there is significant difference between the posttest scores in Physics when exposed using Think Pair Share strategy and lecture method as shown in their t-value of 4.9971 that corresponds to the p-value of 5.68E-06. It shows that there was a mean difference of 5.23 between the two groups with mean scores of 18.93 in the experimental group and 13.7 in the control group. Therefore, the null hypothesis is rejected. The strategy enables students to improve their competence fast because it gives students time to think, to ask and answering questions, to share ideas, and to help each other in doing academic tasks to be successful together. The think pair share strategy increases the kinds of personal communication that are necessary for students to internally process, organize, and retain ideas. Flipping the classroom does exactly what it sounds like. It reverses the traditional learning dynamics, completely. With this method, students don’t learn new content in the classroom, by having a teacher instruct them. Instead, they learn it from video and online sources in their own time and place. Using flipped learning students collaborate more, students are more prepared when coming to class and the students gain more confident in responding to the content. In short, the researchers conclude that the Flipped learning and Think Pair Share strategy gave significant effect to the students’ reading ability.

In connection, based on the results of the students’ posttest scores in science when exposed to Flipped learning and Think Pair Share strategy and lecture method proves that there was an improvement seen on the experimental group. It implies that Flipped learning and Think Pair Share strategy is effective in improving the performance of the students in Physics. Working with collaboration shows to be more effective in developing mental level of every individual (Jensen and Lawson, 2011).
The study of Flipped Learning Concerning Learning Motivation and Learning 
attitude in Language Learning.

Chen, Hung (2021) conducted the study of the influence of think pair share strategy on improving students’ oral communication skills in EFL classrooms. The research finding are as follows: 1) the highest percentage of teachers agrees on the effectiveness of think pair share strategy in speaking ability of the students. The progress of students’ achievement increases after the teacher applied Think Pair Share techniques in speaking classes, the strategy is really effective in engaging students; 2) the result of the application of the strategy in speaking class students, became more cooperative and increases students’ self-confidence; 3) the students consumed less time in thinking because they started to learn how to organize their ideas; 4) the learning process of the students enhanced and became more active and more enthusiastic and they started to interact through speaking. Chou, Chen, Hung (2021) conducted the study of Flipped Learning Concerning Learning Motivation and Learning Attitude in Language Learning. The result of the study states that with the use of flipped learning students demonstrate better understanding which enhances their learning. This unveils that Flipped learning and Think Pair Share strategy has highly significant results in terms of students’ performance. This proves that Flipped Learning and Think Pair Share strategy is effective in teaching Physics.

Table 3. Paired t-test result showing the difference between the pretest and posttest scores of the two groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean score</th>
<th>Mean Difference</th>
<th>T-value</th>
<th>P-value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy</td>
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<td></td>
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<tr>
<td>Pretest</td>
<td>30</td>
<td>9.17</td>
<td>-9.77</td>
<td>-15.970</td>
<td>3.3E-16</td>
<td>Significant</td>
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<tr>
<td>Posttest</td>
<td>30</td>
<td>18.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture Method</td>
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<td></td>
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<tr>
<td>Pretest</td>
<td>30</td>
<td>9.46</td>
<td>-4.233</td>
<td>-6.462</td>
<td>2.26E-07</td>
<td>Significant</td>
</tr>
<tr>
<td>Posttest</td>
<td>30</td>
<td>113.7</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

With 0.05 level of significance
CONCLUSION AND RECOMMENDATION

Based on the findings of the study, it reveals a significant difference between the pretest and posttest scores of the students when exposed using Flipped learning and Think Pair Share strategy. This study concluded that Flipped learning an Think Pair Share can improve the performance in Physics of the students. This strategy can help students engaged in many activities and can produced new knowledge. Similar study should be conducted.

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