Blended Instructions in the New Normal and Students Learning Gains in Mathematics

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Received May 01, 2022; Revised June 03, 2022; Accepted June 16, 2022

Abstract The study aimed to determine the students learning gains in Mathematics as they were exposed to Blended Learning Instruction in the new normal. The study was a pretest-posttest one-group design. The data was gathered using the validated teacher-made test which was based on the Most Essential Learning Competencies (MELCs) as mandated by the Department of Education. Pretest and post-test were conducted before and after the intervention respectively. The respondents were the 41 Grade 10 students of Misamis Oriental General Comprehensive High School (MOGCHS). Mean, Standard deviation, and paired t-tests were used to analyze the data. The analysis yielded a computed P-value of 0.000 which means that a significant difference in learning gains was observed as the students were subjected to blended instruction using the module and a constant follow-up via messenger. Therefore, it is recommended that blended learning instruction in the new normal gives a positive outcome to student achievements in Mathematics.

Keywords: learning gains in mathematics, blended learning instruction, new normal


1. Introduction

The COVID-19 pandemic brought challenges to the Philippine educational system. The Department of Education (DepEd) is addressing the challenges through its Basic Education Learning Continuity Plan (BE-LCP) under DepEd Order No. 012, s. 2020 to ensure the health, safety, and well-being of the learners, teachers, and personnel in the time of COVID-19 [1]. Under Memorandum Dm-CI-2020-00162 on the Suggested in Implementing Distance Learning Delivery Modalities (DLDM) for the formal education through the following delivery modalities such as the Blended Distance Learning (BDL). Blended Learning, as defined by DepEd, refers to “face-to-face with any or a mix of online distance learning, modular distance learning, and TV/Radio-based Instruction.” [2]. Hassan (2010) sees that blended learning is a way of learning aiming to help the learner achieve the targeted learning outcomes through the blending between the forms of traditional education and e-learning with its patterns inside and outside the classroom [3].

Moreover, according to Colis and Moonen (2001) blended learning is a hybrid of traditional face-to-face and online learning so that instruction occurs both in the classroom and online, and where the online component becomes a natural extension of traditional classroom learning. This distance blended instruction is the hybrid scheme of learning environment that composes the synchronous and asynchronous instructional design [4]. Perven (2016) mentioned as he quoted Salmon (2013) synchronous learning environments provide real-time interaction, which can be collaborative incorporating electronic activities such as an instructor's lecture with a facility for the questions-answer session [5].

Utami (2018) indicated in their research that students who attended blended learning courses had higher achievement scores than those who attended traditional teaching [6]. Akarawang (2017); Ceylan (2016) cited that blended learning can enhance students' learning outcomes, improve students' motivation, and it is an effective way of achieving learning objectives [7]. According to Chen and Jones (2007), a wide range of research studies have found that the blended learning approach has positive effects on student achievement, while other studies of student success are equivalent to traditional education [8]. Contrary Hiett (2017) stated in his study found that blended learning has no significant difference in the academic achievement of special education or regular education students [9]. Furthermore, Singh, P. (2019) mentioned that applying blended learning as an instructional model can take the teachers' serious effort to urge most profit [10]. In this, the study needs to investigate the student achievement in blended learning instruction in the new normal of the Grade 10 students in Mathematics.
2. Methodology

2.1. Research Design

This study is a pretest-posttest research design that aims to investigate the effects of blended learning instructions on the students’ achievement in Mathematics during the new normal. Synchronous and asynchronous blended learning instructions are used in the study. During the synchronous learning instructions the teacher used different platforms like Zoom and Google Meet, students virtually attend a class session three times a week every afternoon. Meanwhile, for the asynchronous learning instructions, the teacher provides modules, teacher-made video lessons, PowerPoint presentations, and google meet recordings in the google classroom and Facebook group for them to cope with and understand the topics discussed. Assessments on every topic were given using Google forms but results were not included in the analysis. Only the pre-test and post-test scores were used in the analysis of the data which were given face to face.

2.2. The Instruments

The instrument used in this study was a validated teacher-made test with a table of specifications (TOS) covering the 2nd quarter topics based on the Most Essential Learning Competencies (MELCs) as provided by the Department of Education for grade 10 level.

2.3. The Respondents

Respondents of the study are the forty-one (41) Grade 10 students who belong to the general section at Misamis Oriental General Comprehensive High School for the school year 2021-2022.

2.4. Data Gathering Procedure

The data of the study were gathered using a teacher-made test. Scores during pre-test and post-test which were given before and after the intervention respectively were the main data used in the study.

3. Results and Discussions

Table 1. Mean and Standard Deviation

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std Deviation</th>
<th>Std Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>5.32</td>
<td>41</td>
<td>2.207</td>
<td>345</td>
</tr>
<tr>
<td>Post-Test</td>
<td>7.54</td>
<td>41</td>
<td>1.951</td>
<td>305</td>
</tr>
</tbody>
</table>

The table shows an increase in the mean during pre-test and post-test in favor of the post-test. Also, the scores of the students during the post-test are quite closer compared to the pre-test as revealed by the standard deviation. It implies a uniformity of learning gains in mathematics as the students are exposed to blended learning using synchronous and asynchronous instructions. The result may also imply that having a limited virtual meeting with the students helps them learn. Further, recording proceedings during a virtual meeting, or posting any available lesson recording on the Facebook or google classroom helped students cope with the lessons. Students can view the recordings as many as they can until they understood the lessons. To determine the significant difference in the increase in mean score, the paired sample t-test is used.

Table 2. PAIRED SAMPLE TEST

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1 Pre-Test – Post Test</td>
<td>-2.220</td>
<td>2.308</td>
<td>.360</td>
<td>-2.948</td>
<td>-1.491</td>
<td>-6.158</td>
<td>40</td>
</tr>
</tbody>
</table>

The analysis yielded a value of $t = 6.15$ and $p = 0.000$. It means that there is a significant difference in student achievement scores in Mathematics as they are exposed to the blended learning instructions. It implied further that the blended learning instructions used in the study are one of the effective learning modalities in the new normal. It has positive effects on students’ achievement in Mathematics.

4. Conclusions and Recommendations

From the analysis of the data, the researcher claimed that synchronous learning instructions using Zoom and Google Meet, and asynchronous learning instructions, using modules, teacher-made video lessons, PowerPoint presentations, and google meet recordings posted in the google classroom and Facebook group may be a good teaching modalities to be used during new normal. It helped improve the learning of the students in Mathematics in the new normal where the students are having a remote class. The researchers, therefore, recommend that the synchronous and asynchronous learning instruction used in the study may be widely used for a better learning gain in mathematics.

References

[9] Hiett, Brandy An Examination of Blended Learning and the Traditional Classroom Using the Achievement Scores. [https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=4207&context=dissertations.]


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