

# Aloner's Math Text-Based Glossary in Enhancing Learners' Vocabulary Acquisition and Performance

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**Abstract**— This study aimed to determine the effect of ALONER'S Math Text-based Glossary on learners' vocabulary acquisition and performance among Grade 7 students of Dapdap Integrated School. Specifically, it assessed the level of the glossary. It also evaluated the extent of learners' vocabulary acquisition, performance in formative and summative tests, as well as the significant difference between these assessments. Furthermore, it examined whether ALONER'S Math Text-based Glossary had a significant effect on learners' vocabulary acquisition and performance. The study employed a descriptive research design and was conducted during the third quarter of the school year 2024–2025. The respondents were 83 Grade 7 learners from Dapdap Integrated School. The primary instructional tool was the ALONER'S Math Text-based Glossary with QR codes. Findings revealed that ALONER'S Math Text-based Glossary was highly accepted by learners. Learners' vocabulary acquisition was also rated as highly acquired. In terms of performance, learners achieved a proficient rating in formative tests and an advanced rating in summative tests, indicating stronger performance in summative assessments. A significant difference was observed between learners' formative and summative test scores, favoring summative assessments. However, multiple regression analysis revealed that ALONER'S Math Text-based Glossary did not have a statistically significant effect on learners' vocabulary acquisition and performance. ALONER'S Math Text-based Glossary has shown significant difference between the formative and summative test of the learners leading to the rejection of the null hypothesis. Therefore, it is concluded that the material was well-received and fostered engagement through QR code-enabled video explanations. Furthermore, no significant effect was observed on the use of the material on vocabulary acquisition and performance of the learners resulted to rejection of both hypotheses. This implies that the material provides structured components and engaging features, but these indicators alone do not directly influence learners' vocabulary proficiency and performance as success also depends on their number sense, reasoning skills, and problem-solving strategies. In light of these conclusions, it is recommended that Mathematics teachers enhance the use of ALONER'S Math Text-based Glossary by incorporating additional instructional strategies, such as guided practice and interactive discussions, to improve learners' performance. Learners should actively utilize the glossary alongside problem-based exercises to strengthen their retention and application of mathematical terms. Future researchers may explore other variables affecting learners' vocabulary acquisition and performance, such as learning styles, cognitive load, and instructional design, to further refine the effectiveness of text-based glossaries in mathematics education.

**Keywords**— Text-based glossary, Mathematics vocabulary, vocabulary acquisition, performance, QR code.

## I. INTRODUCTION

Additional resources are essential for facilitating the teaching and learning process. These are intended to provide learners with various engaging activities and experiences in improving knowledge, skills and even the capacity in assessing their own learning. Supplementary materials can be in form of skills development resources, practice materials, appealing worksheets, communicative activity collections, teacher's resources and web page materials that can be developed or adapted in recognized sources. These instruments enhance the main instructional resources and learning materials in reaching educational standards and competencies.

Quizalize.com was used to create the supplemental materials that supported this study. The site used for material development is a web-based game that allows learners to be engage in class while providing immediate assessments for personalized learning. The web-based game assists learners to identify their strengths, weaknesses, and learning gaps and to intervene in real-time through extending one-on-one help in the classroom.

Assessment on the other hand is an essential part of this study and an important component of curriculum implementation. In reference to DepEd Order no. 8 s. 2015 known as the Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program, assessment is defined as the process used to monitor learners' progress based on learning standards and development of 21st century skills, promotion of self-reflection and personal accountability for own learning, and provide bases for profiling performance of learners on the learning competencies and standards of the curriculum. Formative assessment as one of the types of classroom assessment is designed to check the effectiveness of instruction that can be facilitated anytime in the teaching-learning process. The results of this assessment underpin instructional adjustments.

Formative assessment as the mechanism used in this research determines the effectiveness of the developed supplementary materials via prospective improvement to learners' assessment results. The study was conceptualized as a contribution to instructional innovations and to serve as a springboard for other researchers in developing tools and instruments that will support students in improving their learning outcomes. The study acknowledges the trend of innovation in the teaching and learning process designed to capacitate students with various abilities and learning

potentials including the role of every participant in the assessment process.

*1.1 Statement of the Problem*

*Problem/s which were addressed by the research*

This research was designed to evaluate the effectiveness of the supplementary materials developed through Quizalize.com in improving assessment results of learners. In particular, this study aimed to address the following questions:

1. What is the level of the learners’ performance in Philippine Politics and Governance based on their pre-assessment results:
  - a. Experimental group
  - b. Control group?
2. What is the level of the learners’ performance in Philippine Politics and Governance based on their post assessment results:
  - a. Experimental group
  - b. Control group?
3. Is there a significant difference between learners who used the supplementary materials developed through Quizalize.com and learners who did not use the supplementary materials based on their pre- assessment and post assessment results?

II. METHODOLOGY

The instruments that were used in this research are the following:

1. The pre-assessment tool composed of 40 item questions and covers the six lessons in PPG for the second quarter of School Year 2022-2023. This tool was accomplished by all of the respondents whether from the experimental group or control group and was answered through google forms. All questions were anchored in the lessons’ MELCs and were composed through a table of specification. No score and key to corrections were given to respondents after its accomplishment and scores will only be seen by the researcher for analysis.
2. The Quizalize.com platform was used to create supplemental materials that included six sets of time-bound activities, each with 25 questions, designed to enhance students' evaluation outcomes and memory retention. All of the activities were anchored to the lessons’ MELCs and are formulated based on the applicable Cognitive Process Dimension stated in DO 8 s. 2015.
3. The post assessment tool composed of 40 item questions is same with content from the pre-assessment tool and also covers the six lessons in PPG. This tool was accomplished by all of the respondents whether from the experimental group or control group and were answered through google forms. All questions were anchored to the lessons’ MELCs and were composed through a table of specification. Scores and key to corrections were given to respondents after its accomplishment.

III. RESULTS AND DISCUSSION

This part presents the analysis and interpretation of the data gathered. Data sets were analyzed and interpreted based on the problems raised in the study with corresponding tables presented sequentially to give clarity on data presentation analysis.

Experimental Group Learners’ Level of Performance in Philippine Politics and Governance Based on Pre-Assessment Results

TABLE 1. Mean Level of Experimental Group Learners’ Level of Performance in Philippine Politics and Governance Based on Pre-Assessment Results

Most Essential Learning Competencies (Melcs)	Mean	SD	Verbal Interpretation
1. Analyze the roles and responsibilities of the Philippine Judiciary.	3.10	1.1005	Low
2. Explain the roles and functions of Local Government Unit (LGU)			
3. Analyze the nature of elections and political parties in the Philippines.	2.30	1.1595	Very Low
4. Explain the concept, role, and contributions of civil society societies and social movements to Philippine democracy.	2.90	1.3703	Low
5. Explain the importance of active citizenship.	2.40	0.9660	Very Low
6. Explain issues and programs related to political engagement and youth empowerment.	2.20	1.1353	Very Low
<b>Average</b>	<b>2.58</b>	<b>1.1463</b>	<b>Very Low</b>

The table above shows the performance level of 10 learners from the experimental group for Philippine Politics and Governance based on pre-assessment results. The figures revealed that the learners’ competency to explain and analyze the roles and responsibilities of the Philippine Judiciary and the Local Government Unit has a mean value of 3.10 with a standard deviation (SD) of 1.1005 and a verbal interpretation of low. The learners’ competency to analyze the nature of elections and political parties in the Philippines has a mean value of 2.30 with an SD of 1.1595 and a verbal interpretation of very low. The learners’ competency to explain the concept, role and contributions of civil society societies and social movements to Philippine democracy has a mean value of 2.90 with an SD of 1.3703 and a verbal interpretation of low. The learners’ competency to explain the importance of active citizenship has a mean value of 2.40 with an SD of 0.9660 and verbal interpretation of very low. The learners’ competency to explain the issues and programs related to political engagement and youth empowerment has a mean value of 2.20 with an SD of 1.1353 and a verbal interpretation of very low. In average, the learners’ competencies for the second quarter of the school year based on pre-assessment results has a mean value of 2.58 with an SD of 1.1463 and a verbal interpretation of very low. The standard deviation in average is higher than 1 which signifies a heterogenous sample and data are more spread out.

Control Group Learners’ Level of Performance in Philippine Politics and Governance Based on Pre- Assessment Results

TABLE 2. Mean Level of Control Group Learners' Level of Performance in Philippine Politics and Governance Based on Pre-Assessment Results

Most Essential Learning Competencies (Melcs)	Mean	SD	Verbal Interpretation
1. Analyze the roles and responsibilities of the Philippine Judiciary.	2.60	1.6895	Very Low
2. Explain the roles and functions of Local Government Unit (LGU)			
3. Analyze the nature of elections and political parties in the Philippines.	2.30	1.3375	Very Low
4. Explain the concept, role, and contributions of civil society societies and social movements to Philippine democracy.	1.80	1.0328	Very Low
5. Explain the importance of active citizenship.	1.40	0.9661	Very Low
6. Explain issues and programs related to political engagement and youth empowerment.	1.50	0.8498	Very Low
<b>Average</b>	<b>1.92</b>	<b>1.1751</b>	<b>Very Low</b>

The table above shows the performance level of 10 learners from the control group for Philippine Politics and Governance based on pre-assessment results. The figures revealed that the learners' competency to explain and analyze the roles and responsibilities of the Philippine Judiciary and the Local Government Unit has a mean value of 2.60 with a standard deviation (SD) of 1.6895 and a verbal interpretation of very low. The learners' competency to analyze the nature of elections and political parties in the Philippines has a mean value of 2.30 with an SD of 1.3375 and a verbal interpretation of very low. The learners' competency to explain the concept, role and contributions of civil society societies and social movements to Philippine democracy has a mean value of 1.80 with an SD of 1.0328 and a verbal interpretation of very low. The learners' competency to explain the importance of active citizenship has a mean value of 1.40 with an SD of 0.9661 and verbal interpretation of very low. The learners' competency to explain the issues and programs related to political engagement and youth empowerment has a mean value of 1.50 with an SD of 0.8498 and a verbal interpretation of very low. In average, the learners' competencies for the second quarter of the school year based on pre-assessment results has a mean value of 1.92 with an SD of 1.1751 and a verbal interpretation of very low. The standard deviation in average is higher than 1 which signifies a heterogenous sample and data are more spread out.

Experimental Group Learners' Level of Performance in Philippine Politics and Governance Based on Post Assessment Results

TABLE 3. Mean Level of Experimental Group Learners' Level of Performance in Philippine Politics and Governance Based on Post Assessment Results

Most Essential Learning Competencies (MELCs)	Mean	SD	Verbal Interpretation
1. Analyze the roles and responsibilities of the Philippine Judiciary.	7.80	0.4216	Very High
2. Explain the roles and functions of Local Government Unit (LGU)			
3. Analyze the nature of elections and political parties in the Philippines.	7.00	1.0541	Very High
4. Explain the concept, role, and contributions of civil society societies and social movements to Philippine democracy.	6.90	1.2867	Very High
5. Explain the importance of active citizenship.	7.00	0.6667	Very High
6. Explain issues and programs related to political engagement and youth empowerment.	7.60	0.6992	Very High
<b>Average</b>	<b>7.26</b>	<b>0.8257</b>	<b>Very High</b>

The table above shows the performance level of 10 learners from the experimental group for Philippine Politics and Governance based on post assessment results. The figures revealed that the learners' competency to explain and analyze the roles and responsibilities of the Philippine Judiciary and the Local Government Unit has a mean value of 7.80 with a standard deviation (SD) of 0.4216 and a verbal interpretation of very high. The learners' competency to analyze the nature of elections and political parties in the Philippines has a mean value of 7.00 with an SD of 1.0541 and a verbal interpretation of very high. The students' ability to articulate the concept, function, and contributions of civil societies and social movements to democracy in the Philippines has an average value of 6.90, with a standard deviation of 1.2867 and a verbal interpretation of very high. The learners' competency to explain the importance of active citizenship has a mean value of 7.00 with an SD of 0.6667 and verbal interpretation of very high. The learners' competency to explain the issues and programs related to political engagement and youth empowerment has a mean value of 7.60 with an SD of 0.6992 and a verbal interpretation of very high. In average, the learners' competencies for the second quarter of the school year based on post assessment results has a mean value of 7.26 with an SD of 0.8257 and a verbal interpretation of very high. The standard deviation in average is lower than 1 which signifies a homogenous sample and data are clustered around the mean.

Control Group Learners' Level of Performance in Philippine Politics and Governance Based on Post Assessment Results

TABLE 4. Mean Level of Control Group Learners' Level of Performance in Philippine Politics and Governance Based on Post Assessment Results

Most Essential Learning Competencies (MELCs)	Mean	SD	Verbal Interpretation
1. Analyze the roles and responsibilities of the Philippine Judiciary.	3.20	1.9889	Low
2. Explain the roles and functions of Local Government Unit (LGU)			
3. Analyze the nature of elections and political parties in the Philippines.	2.90	2.4244	Low
4. Explain the concept, role, and contributions of civil society societies and social movements to Philippine democracy.	2.60	1.4298	Very Low
5. Explain the importance of active citizenship.	2.40	1.1738	Very Low
6. Explain issues and programs related to political engagement and youth empowerment.	2.20	2.2509	Very Low
<b>Average</b>	<b>2.66</b>	<b>1.8536</b>	<b>Very Low</b>

The table above shows the performance level of 10 learners from the control group for Philippine Politics and Governance based on post assessment results. The figures revealed that the learners' competency to explain and analyze the roles and responsibilities of the Philippine Judiciary and the Local Government Unit has a mean value of 3.20 with a standard deviation (SD) of 1.9889 and a verbal interpretation of low. The learners' competency to analyze the nature of elections and political parties in the Philippines has a mean value of 2.90 with an SD of 2.4244 and a verbal interpretation

of low. With a mean value of 2.60, a verbal interpretation of very low, and an SD of 1.4298, the students' ability to articulate the idea, role, and contributions of civil society organizations and social movements to Philippine democracy is measured. The learners' competency to explain the importance of active citizenship has a mean value of 2.40 with an SD of 1.1738 and verbal interpretation of very low. The learners' competency to explain the issues and programs related to political engagement and youth empowerment has a mean value of 2.20 with an SD of 2.2509 and a verbal interpretation of very low. In average, the learners' competencies for the second quarter of the school year based on post assessment results has a mean value of 2.66 with an SD of 1.8536 and a verbal interpretation of very low. The standard deviation in the mean is greater than 1, indicating a heterogeneous sample and that the data is more dispersed.

Difference Between Learners Who Used the Supplementary Materials Developed through Quizalize.com and Learners Who Did Not Use the Supplementary Materials Based on Pre and Post Assessment Results.

TABLE 5. *t*-Test Results of Learners Who Used the Supplementary Materials Developed through Quizalize.com and Learners Who Did Not Use the Supplementary Materials Based on Pre and Post Assessment Results

Group	Mean	SD	<i>t</i> -Value	<i>t</i> -Critical	P-Value	Decision
Experimental	Pre-Assessment: 2.58	Pre-Assessment: 1.1463	-16.8777	2.262	0.00001	Significant
	Post Assessment: 7.26	Post Assessment: 0.8257				
Control	Pre-Assessment: 1.92	Pre-Assessment: 1.1751	-1.4255	2.262	0.171123	Not Significant

Post Assessment: 2.66	Post Assessment: 1.8536			
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Alpha=0.05

Significance:  $p < .05$

Based on pre-assessment and post-assessment results, the table above compares students who utilized the supplemental materials created through Quizalize.com with those who did not. The figures revealed that the experimental group in their pre- assessment attained a mean value of 2.58 with a standard deviation (SD) of 1.1463 while in their post assessment attained a mean value of 7.26 with an SD of 0.8257. Based on the data, the experimental group achieved a *t*-value of -16.8777 with a critical value of 2.262 and a *p*-value of 0.00001 which made the results through the use of the supplementary materials significant. On the other hand, the control group in their pre- assessment attained a mean value of 1.92 with an SD of 1.1751 while in their post assessment attained a mean value of 2.66 with an SD of 1.8536. Based on the data, the control group achieved a *t*-value of -1.4255 with a critical value of 2.262 and *p*-value of 0.171123 which makes the result without the intervention of the supplementary material not significant.

#### IV. CONCLUSION AND RECOMMENDATIONS

The conduct and outcomes of the study helped the researcher to unveil the importance of supplementary materials in the teaching and learning process. It is clear based on the results that these materials helped learners in improving learning performance as evident in their assessment outcomes. It is conclusive that better performance and learning are more apparent if there are tools and mechanisms designed to scaffold learners in the process as compared from the traditional set-up of teaching and learning. There are instances because of technological challenges in several aspects both on teachers and learners, difficulties in development, access and utilization on both sides are encountered. As long as creativity and innovation are practiced by teachers even not through highly sophisticated technology, learning goals will be possible.

Academic Freedom for teachers in the discharge of their professional duties, particularly with teaching and classroom methods as what is stated in RA 4670 is not just a provision but a conviction for educators to enrich their teaching practices not only in content and assessment but most especially in pedagogy.

We are in the 21st Century, learning demands of students are quite different compared from what we have in the past. Creativity and innovation are essential to make the whole learning process successful in which material development is an example.

According to Albert Einstein, “You can’t solve a problem on the same level that it was created, you have to rise above to the next level.”

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