

PROJECT WERPA (WORKSHEETS, E-GAMES, REMEDIATION & PEER ASSISTANCE): NUMERACY SKILL ENHANCEMENT FOR STUDENTS OF SAN PASCUAL SENIOR HIGH SCHOOL 2

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ABSTRACT

This study evaluates the effectiveness of Project WERPA in enhancing students' proficiency in specific Mathematics competencies, identified through an analysis of test results conducted by the teacher-researcher. Employing a descriptive research approach, the primary data collection instrument was a questionnaire. Test results revealed that students faced challenges in mastering key Mathematics topics, including rational, inverse, exponential, logarithmic functions, and logic. The respondents acknowledged the positive impact of Project WERPA in stimulating their interest and facilitating comprehension of Mathematics concepts. However, they candidly expressed concerns about the absence of a web-based learning environment in the school and insufficient access to devices for effective implementation of Project WERPA. The study recommends the development of a dedicated website for Project WERPA to address these limitations. Proposed enhancements include the incorporation of enrichment materials and activities featuring questions related to the least mastered lessons. This digital-oriented approach is expected to increase student engagement by leveraging technology—an innovation that aligns with the proficiency of today's learners.

Keywords: Project WERPA, Numeracy Skills, Least Mastered Skills and Competencies

INTRODUCTION

Mathematics has a special place in the school curriculum since it is essential for a person to live a better life. However, it is well known that the majority of students regard Mathematics as a difficult subject. It plays a vital role in our lives since teaching and learning Mathematics in elementary school is just as important as any other subject. Students should study math to learn how to solve issues and meet practical needs such as data collection, counting, and processing.

In connection, according to Nathan Dieckmann (2008), the capacity to comprehend and manipulate numbers is referred to as

numeracy. Numeracy skill is defined as the ability to effectively manage the use of Mathematics in everyday aspects of life. It is the skill of having the confidence to interpret and communicate mathematical information and ideas. A promising way to enhance the numeracy skills of students is by helping them learn mathematics with understanding. Teaching mathematics should be enjoyable to ensure that learners acquire knowledge from mathematics lessons.

Effective teaching methodologies and approaches have a significant impact on students' academic growth and performance. Researchers have delved into many tactics and approaches that

help improve learning outcomes and build a healthy classroom atmosphere over the years.

The findings of Magbanua's (2018) study supported the efficacy of self-guiding worksheets in enhancing students' performance in proving and operating trigonometric expressions, as well as simplifying trigonometric identities. These worksheets are an excellent resource for improving pupils' mathematical abilities, particularly in solving trigonometric identities.

Meanwhile, Mubaslat (2012) suggested that incorporating games into language training, particularly during the earliest stages, might be quite beneficial. Games are effective instruments for aiding second language acquisition by making the learning process more engaging and entertaining for pupils.

Furthermore, according to Kumar (2016), remedial learning is a critical component of effective education. This method tailors training to each student's specific needs, taking into consideration their existing level of comprehension. Remedial education promotes and supports students to achieve better levels of competency in their studies by applying intrinsic techniques of incentive.

Lacaba (2015), on the other hand, found that implementing the Peer Teaching technique improved Grade 3 kids' academic performance in mathematics. The data demonstrated that this teaching method resulted in considerable improvements in the students' mathematics ability and achievements.

Despite the growing importance of Mathematics in all aspects of life in any society, learners in schools appear to lose their interest in it. They appear to have mixed attitudes and perspectives towards Mathematics. In the quest for solutions to the lack of grip that the learners have for Mathematics education today, the researchers believed that a way to successful Mathematics teaching and learning goes through something about how far the teacher and student can critically and constructively improve their mathematical skills and mind.

The researchers observed that students don't perform at their best level when the strategies used in teaching are conventional. This is reflected in the low MPS result on the teacher-made test.

When they were instructed to perform group activities, there were times that they were asking if they could use the digital approach to deliver the results. This is a clear manifestation that students in this generation want to learn the way they wish to. It merely depends on the active support to be provided by the teachers to attain their learning goals.

As a result, this action research was conducted to ascertain the implications of the school-based numeracy project and activity called Project WERPA (Worksheets, E-games, Remediation, and Peer Assistance) as an intervention to improve the numeracy skills of the Senior High School (SHS) students at San Pascual Senior High School 2 during the school year 2022-2023. The primary learning strategy incorporated to meet the researchers' determined goals was the use of the school-based numeracy program and activity: Project WERPA which caters research-based strategies into the daily school routine.

The findings of the study could be utilized as a point of reference to direct and guide the students and teachers in making adjustments in their teaching and learning strategies and programs that will eventually enhance the students' numeracy skills. Hence, to assess the said intervention activities' implications on the clientele, the researchers gathered information and documented its effect on students' numeracy skills.

OBJECTIVES OF THE STUDY

The primary goal of this research is to investigate the implication of using Project WERPA to teach Mathematics at San Pascual Senior High School 2 during the academic year 2022-2023.

It specifically seeks to answer the following questions:

1. Enumerate the distinct features of Project WERPA.
2. Identify the least mastered competencies in General Mathematics based on the teacher-made test.
3. Describe how the students perceive the effectiveness of Project WERPA in learning Mathematics
4. Determine the challenges encountered by the students in learning Mathematics using



the Project WERPA.

- Propose other intervention activities to intensify the utilization of project WERPA in teaching and learning Mathematics.

METHODOLOGY

The descriptive research design was employed in this study. According to Castillo (2007), descriptive studies comprised information such as present situations concerning the nature of a group of people, as well as a class of events, and involved the techniques of data analysis, categorization, enumeration, and measurement.

Purposive sampling was also utilized in this study. According to Fraenkel Birion and De Jose (2000), it was used to pick a sample that the researcher believed would offer the data needed in the study based on prior information and understanding of the sample respondents.

Additionally, unstructured interviews were conducted in the form of casual conversations with some of the respondents. No fixed questions were asked, and only questions that needed clarification and were relevant to the study were given attention. Moreover, the questions asked depended on the actual observation of the researchers and the answers of the respondents. Distribution and retrieval of the questionnaires to the respondents were done during the School Year 2022-2023. The gathering of relevant literature in libraries and online sources was also done to provide support to the findings of the study.

RESULTS AND DISCUSSION

1. Distinct Features of Project WERPA

Project WERPA is a math-friendly innovation for teachers to help and provide students the opportunity to learn and study collaboratively. It will boost students' participation, drive, and engagement in the curriculum while also allowing educators to be innovative and imaginative in how they present things. It will additionally require students to put into practice the information, allowing them to use and assess their abilities to think critically.

The objectives of the proposed interactive intervention materials and coaching are (1) to help boost learners' mathematical mastery and comprehension skills through enhanced worksheets; (2) to stimulate, motivate, and sustain learners' interests in the mathematics subjects through inclusive e-games; and (3) to assist academically challenged learners through remediation and peer assistance.

The project utilizes a learner-centered and interactive method that requires active participation among the learners while teachers will only act as facilitators. The activities chosen for mathematics teaching and learning must foster student activity and the acquisition of learning abilities, while a supportive atmosphere is developed to allow the learner to communicate effectively with other students.

Here are the activities and lesson ideas using the Project WERPA in mathematics:

Worksheets- SKL (Sheets of Knowledgeable Learning)

E-games- SML (Source and Management for Learning)

Remediation- PETMALU (PERformance Task in MATHematics Learning and Understanding)

Peer

Assistance- LODI (Leaders of Direct Instruction)

2. Least Mastered Competencies in General Mathematics

Table 1
Least Mastered Competencies in General Mathematics

Learning Content/Competencies	Correct Responses	Percentage	Interpretation
Functions Solve problems involving functions	58	57%	Nearing Mastery
Rational Functions Inverse, Exponential and Logarithmic Functions Solve problems involving rational, inverse, exponential and logarithmic functions	50	49%	Not Mastered
Basic Business Mathematics Solve word problems involving interest	52	51%	Nearing Mastery
Logic Writing proofs	45	44%	Not mastered

It could be gleaned from the table presented on the next page that there are some competencies in Mathematics found to be least mastered by the learners. The concepts covered in Functions,



Rational, Inverse, Exponential, and Logarithmic Functions, Basic Business Mathematics, and Logic were found to be the least mastered based on the results of the teacher-made test.

Out of one hundred two (102) respondents, only fifty-eight (58) students, or 57% got the correct answer in the item which focused on the competency which pertains to solving problems involving functions. In terms of solving word problems involving interest, fifty-two (52) students, or 51% got the correct answers on that particular item. Relative to the competency in solving problems about rational, inverse, exponential, and logarithmic functions, fifty (50) students, or 49% got the correct answer. On the other hand, in terms of writing proof under logic, forty-five or 44% got the answer for those specific items.

This finding conformed to the experimental research conducted by Romero (2016) in his experimental research. From the findings, he revealed that the students in Zambales were not participative when he used the conventional method in teaching science concepts, particularly in kinematics and dynamics. However, a remarkable improvement was noticed after the integration of innovative strategy in the form of a game.

This could also imply that the topics for which these competencies are prerequisites may be difficult to teach. This is corroborated by Hubilla (2013), who determined that mathematical abilities depend on one another and that students must create a solid mathematics skill or concept on which everything they learn will be constructed. According to Reymundo (2004), students do poorly when addressing problems with words in mathematics. According to Pondalis (2011), teachers attending English should focus on students' unmastered skills to attain the 75% competency level. A suitable reading intervention program should be developed. Reading readiness can be improved through remedial education by employing a variety of activities to improve the teaching-learning process. Bermundo (2004) concluded that teachers should be more imaginative in generating diverse teaching resources that meet the demands of both teachers and students.

This finding is a clear manifestation that today's teaching and learning must adopt the possible use of modern technology which has the power to promote students' engagement in classroom activity if the said activity is applied based on the students' preferences, needs, and learning styles.

3. Effectiveness of Project WERPA in Teaching and Learning Mathematics

Table 2
Effectiveness of Project WERPA

The integration of Project WERPA...	WM	VI	Rank
1. stimulates the student's interest in learning Mathematics concepts	3.52	VE	1
2. relieves stress and uses it for entertainment purposes	3.06	E	5
3. enhances the student's knowledge and skills in Mathematics.	3.35	E	2
4. due to repetitive examples and exercises that were presented in the form of a game			
5. trains students to become problem solvers/doers which is essential in real-life situations	3.32	E	3
6. provides a great opportunity for students to participate in class discussions and other performance tasks in Mathematics	3.24	E	4
Composite Mean	3.30	E	

Legend: WM= Weighted Mean; VI= Verbal Interpretation; VE= Very Effective; E = Effective; ME = Moderately Effective; NE = Not Effective

It can be deduced from the table presented on the next page that students have high regards for the effectiveness of Project WERPA in helping them understand the concepts in Mathematics. They were one with their assessment that Project WERPA integration stimulates students' interest in class discussion in Mathematics. It also enhances the students' knowledge and skills in Mathematics due to repetitive examples and exercises which were presented in the form of games. These obtained weighted means of 3.52 and 3.35 and were interpreted as very effective and effective respectively.

In the same vein, Project WERPA trains students to become problem solvers/doers which are essential in real-life situations. This item ranked third got a weighted mean of 3.32 and was interpreted to be effective. The said integration also provides a great opportunity for students to participate in class discussions and other performance tasks in Mathematics. This item ranked fourth got a weighted mean of 3.24 and was interpreted to be effective.



This confirmed the findings of Inan et al., (2017) that Math worksheets developed on the foundation of the Multiple Intelligences Theory improved students' academic ability in general. According to the findings of their research, preparing Math worksheets based on students' distinct intellectual sectors can favorably influence students' academic progress.

Also, the findings of Mughal and Zapar (2011) explained that the digital learning approach is a vital ingredient to adjust to the nature of the learners who are now coined "millennials". They are the types of learners who greatly rely on the acquisition of knowledge from the technological media. The finding also supported the ideas of Donmus (2011), who explained that the application of computer games is useful in making the students' learning experience more delightful. He stressed that this mode of learning is more effective than traditional learning modes.

Sitzmann (2016) reported the findings in a meta-analytical assessment of articles analyzing the usefulness of educational games. She discovered that training with gaming generated 20% greater confidence, 11% greater comprehension of facts, 14% more skill-based knowledge, and 9% more retention when compared to a control group. The popularity of instructional games as motivating factors has expanded over time.

It was supported by the findings of Papastergiou (2009), who concluded that digital games have several advantages over other instructional media, the main one being they're extremely compelling and engaging in nature and constitute potentially powerful learning environments for several reasons. The digital games can support multi-sensory, active, experiential, and problem-based learning. In addition to that, they favor activation of prior knowledge given that players must use previously learned information to advance.

Relieving stress for entertainment using digital games was rated to be effective by the student-respondents which obtained a weighted mean of 3.46. This item ranked fifth among the five items listed in the survey questionnaire. The results conformed to the study of Elis (2016) in which he revealed that game scheme patterns entertained

the students to like what they were doing as instructed by the teacher. He used the snake and ladder concept to deal with the problems that students had in learning mathematical topics.

Although digital game-based activities guarantee fun learning experiences for students, they were still ranked last. This could be attributed to the fact that games should not only focus on making them attractive and appealing to students, but they should also consist of activities and exercises that encourage analytical thinking and higher-level thinking abilities in students. These skills are beneficial in achieving students' optimum development.

4. Challenges Encountered by Students in Integrating Project WERPA in Learning Mathematics

Table 3 indicates that students faced a variety of problems when using Project WERPA to learn Mathematics.

The facts shown above clearly suggest that the accessibility of an online educational setting (classroom with access to the Internet) was at the very top of the list of challenges encountered. It got a weighted average of 2.94.

Table 3
Challenges in Integrating Project WERPA in Learning Mathematics

Challenges	WM	VI	Rank
1. no web-based educational setting. (Classroom and house with access to the internet)	2.94	A	1
2. Lack of gadgets and learning resources	2.82	A	2
3. Some teachers are not acquainted with the use of Project WERPA	2.39	D	5
4. Lack of support from administrators and Stakeholders	2.42	D	4
5. Time-consuming/Time constraints	2.67	A	3
Composite Mean	2.65	A	

The students were honest that they find it hard to download or even play digital learning games readily available online due to the absence of an internet connection. The fact that they don't have sufficient gadgets to manipulate digital learning games also revealed a leading problem for its smooth application. This finding was consistent with the findings of Jones (2016), who discovered that many institutions have "not enough equipment" for implementing technological

advances in the educational setting, including a lack of dependable internet connectivity and linked devices. Students from families with low incomes may face the greatest barriers to using technology. This is primarily because of their priority to attend to the needs of economic problems in terms of daily allowances (baon), and school supplies instead of purchasing gadgets for digital applications.

The findings also confirmed the findings of Gray, Thomas, and Lewis (2010), who discovered that many learners have no reliable and consistent accessibility to a computer. Instructors find it incredibly difficult to incorporate technology into existing lecture plans due to inconsistent computer access. Continuous utilization of equipment (such as computers or smartphones), programs (such as writing and reading applications, and online browsers), and a connection to the internet are essential.

On the other hand, the students did not agree that teachers were not acquainted and showed resistance to the use of modern digital learning technology which obtained a weighted mean of 2.39. This finding contradicts the findings of Ertmer et. al. (2012), who discovered that the most frequently mentioned cause for an absence of

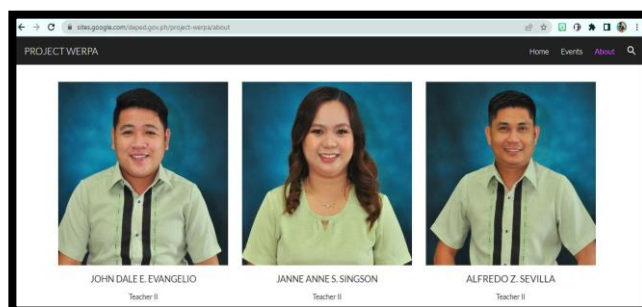
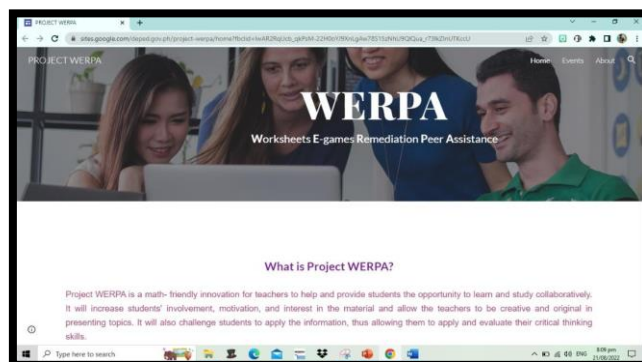
technological integration in the classroom is insufficient competent training and development. They also recommended that public school teachers attend intensive training that will capacitate their knowledge and skills on the proper utilization and integration of digital technology.

As a whole, students agreed that they encountered several problems in using digital learning games which obtained a composite mean of 3.02. However, if there is a strong desire and backing from the top management, these issues can be resolved.

5. Proposed Intervention activities to intensify the utilization of project WERPA in Teaching Mathematics

According to the findings of the study, researchers will create a working website to effectively intensify the utilization of project WERPA in teaching Mathematics in this new normal of education. This website will include enhanced worksheets, inclusive e-games, and

other teaching and learning materials in Mathematics.



CONCLUSIONS

The following conclusions were made based on the study's results.

1. Project WERPA is a math-friendly innovation for teachers to help and provide students the opportunity to learn and study collaboratively. It will increase students' involvement, motivation, and interest in the material and allow the teachers to be creative and original in presenting topics. It will also challenge students to apply the information, thus allowing them to apply and evaluate their critical thinking skills.
2. The least mastered based on the results of the teacher-made test were the topics on Rational, Inverse, Exponential, and Logarithmic Functions, Basic Business Mathematics, and Logic,
3. The students assessed that the application of Project WERPA is effective in making the students easily understand the concepts in Mathematics. They

explained that this enrichment activity and material stimulates their interest which is integral in intensifying their solving problems, logical, and reasoning abilities.

4. The top main problems found in the integration of Project WERPA were determined to be a lack of reliable internet access and connected devices and gadgets.
5. Project WERPA will address the weak findings in the study. The said enrichment material and activity consists of interactive questions from the least mastered lessons to be answered by the students. The said innovation is also expected to develop a positive attitude towards the subject that will lead to a positive impact on performance in Mathematics. The researchers will create a working website to effectively intensify the utilization of project WERPA in teaching Mathematics in this new normal of education. This website will include enhanced worksheets, inclusive e-games, and other teaching and learning materials in Mathematics.

RECOMMENDATIONS

The following recommendations are made based on the study's results and conclusions.

1. The conceptualized Project WERPA may be reviewed by the experts, especially by the learning resource evaluators (LREs) to avoid factual and grammatical errors. Their suggestions will be essential before adopting the material.
2. Intensive training and workshops for Mathematics teachers on different teaching strategies and techniques that can be incorporated into Project WERPA that will further improve the material.
3. Tapping potential stakeholders for possible donation of gadgets and free Wi-Fi installation.
4. Similar research could potentially be carried out in different educational institutions or districts.

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