

PROJECT A.P.T (ADOPTIVE PEDAGOGICAL TECHNIQUES) IN IMPROVING MATHEMATICAL SKILLS OF GRADE 4 STUDENTS IN LUMAMPONG BALAGBAG ELEMENTARY SCHOOL

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ABSTRACT

This study aimed to determine the effects of Project A.P.T (Adoptive Pedagogical Techniques) in Improving Mathematical Skills of Grade 4 Students in Lumamong Balabag Elementary School. It sought the needs of learners that the pedagogical approaches address. Likewise, it asked the benefits derived from the use of the project APT (Adoptive Pedagogical Techniques). Then finally, it determined the performance of Grade Four pupils in Mathematics before and after the administration of Project APT (Adoptive Pedagogical Techniques). Using the quasi-experimental research design, the APT project was administered to the pupils during the first quarter of the school year and commenced on the fourth quarter. With 32 pupil participants, the researchers obtained the following results: The Grade Four pupils have recognized their needs in order for them to learn Mathematics which are further application of concepts, active involvement in the process of meaning and knowledge construction, promotion of skills and subject mastery, sufficient understanding of the subject matter, through explanation of abstract concepts and through self-guided learning. The pupils had already experienced the benefits from the use of Project APT (Adoptive Pedagogical Techniques) as they learn better the subjects in Mathematics. Lastly, Project APT has done a better job in increasing the grades in Mathematics. In view of these results, the researchers recommended that the school should continue the administration of Project APT to secure the learning of the pupils. Moreover, other grade levels may adopt the pedagogy in teaching Math to their respective grade level. Finally, parents and the school may work collaboratively to support the learning of pupils.

Key words: constructivist approach, needs, benefits

1. INTRODUCTION

In most of the world, a mathematics classroom is a space where educators and learners come together to discuss, explore, and learn on mathematical principles and their applications. Teachers engage with students, monitor and assist their learning, and many employ a variety of digital and non-digital materials to help students learn mathematics. (Giles et al, 2021).

Kalogeropoulos et al (2021) in their study aimed to understand how teachers planned and implemented mathematics learning programs for their students, the challenges they encountered, as well as the degree to which their students were motivated or engaged when learning mathematics at home. Findings indicated that both teachers were concerned about effectively catering for all students and assessing student progress and engagement with the tasks. Survey data revealed most students displayed positive engagement with remote learning experiences, except for the lack of opportunity to learn mathematics with and from their peers.

To effectively cater to the needs of learners as well as monitor and assess their skills, Mathematics teachers need to find ways to help the learners learn and eventually master the skill. Thus, as Mathematics instruction and learning are difficult and extremely challenging, worries, fears, and doubts exist. This will lead to Math teachers falling short in helping students achieve the two main objectives of the subject -- problem solving and critical thinking in response to the demands of the 21st century abilities.

In all honesty, Mathematics is affected by three variables namely: Intelligence (IQ) and cognitive entry skills, quality of instruction, and affective characteristics. Although mathematics is intellectual, much research has recommended that future efforts be directed to find variables that are non-intellective to help account for the remaining variation. Study habits and attitudes are considered to be non-intellective factors that do correspond to grades for students (Morosanova et al., (2016).

Moreover, quality mathematics education should enable pupils to form a positive and appropriate image of mathematics. Learning mathematics also entails acquiring the means of gaining access to this cultural heritage. Mathematics education should thus enable pupils to understand that mathematics is not a static corpus of knowledge but, on the contrary, a living and expanding science, whose development is nourished by that of other scientific fields and nourishes them in turn. It should also enable pupils to see mathematics as a science that can and must contribute to the solution of today's

major world problems, which were mentioned in the joint introduction. Quality mathematics education must thus be sustained by a vision of mathematics as a living science, grappling with the real world, open to relations with other disciplines (UNESCO, 2021).

The purpose of the study is to adopt a certain pedagogy in teaching Mathematics to Grade Four pupils which is considered responsive to their learning needs, as teachers would use the pedagogical technique in teaching the subject. Done at Lumampong Balagbag Elementary School, this study aims to uplift the Grade Four learners' skills in Mathematics especially those learners who needed to be remediated in the subject. It also investigates and explores different strategies and techniques which are adaptive to the needs of the learners in school and in their application in their daily lives.

Incidentally, there are five (5) different pedagogical approaches being used namely the constructivist approach, the collaborative approach, the reflective approach, the integrative approach, and, finally, the inquiry-based approach. Pedagogy is the method and practice of teaching in general, especially in relation to academic subjects or theoretical concepts. Each of these approaches is usually placed on a spectrum from teacher-focused to learner-focused pedagogy. As the names suggest, teacher-focused pedagogy revolves around teachers, putting them at the center of the learning process, while learner-focused pedagogy is centred around learners playing an active role in the learning process.

Action Research Questions

This study aimed to determine the effects of Project A.P.T (Adoptive Pedagogical Techniques) in Improving Mathematical Skills of Grade 4 Students in Lumampong Balagbag Elementary School.

Specifically, it sought answers to the following questions:

1. What are the needs of learners that the pedagogical approaches address?
2. What are the benefits derived from the use of the project APT (Adoptive Pedagogical Techniques)?
3. What is the performance of Grade Four pupils in Mathematics before and after the administration of Project APT (Adoptive Pedagogical Techniques)?

Proposed Innovation, Intervention and Strategies

The researcher utilized the constructivist approach in improving the Mathematics abilities of Grade Four pupils. The Constructivist Approach is based on the concept of constructivism. This is the belief that learners create their own understanding of the world around them, and this understanding is based on experience through their everyday lives as they grow. Using specific experiences, people transform the information they have accumulated into knowledge and understanding. This approach is handy for allowing learners to take a more active role in the learning process, as it encourages them to use their previous knowledge as a foundation for understanding new concepts, as opposed to passively receiving information. Thus, this constructivist pedagogy is embodied in the implementation of Project APT which is intended to support learners and teachers in designing lessons that addressed the needs of Grade Four pupils.

It was pilot implemented during Quarter 1 of the school year during which the lessons were administered to the pupils. It was integrated to lessons in the sense that the same lessons were taught but during the remediation time, the approach was purely constructivist in nature. Assessment was done every day and every Friday of the week, the assessment was consolidated and interpreted to find its effectiveness.

In order to effectively implement the Project APT, teachers of the subject matter must ensure to properly implement the project.

For the process, it followed the process below:



Action Research Methods

A. Participants and/or other Sources of Data and Information

The participants of the study were thirty-two (32) Grade Four learners of Lumampong Balagbag Elementary School. It utilized a purposive sampling technique in selecting participants of the study. Purposive sampling refers to a group of non-probability sampling techniques in which units are selected because they have characteristics that are needed in the sample. In other words, units are selected "on purpose" in purposive sampling.

B. Data Gathering Methods

The study used the quasi-experimental method of research. The prefix quasi means "resembling." Thus quasi-experimental research is research that resembles experimental research but is not true experimental research. Although the independent variable is manipulated, participants are not randomly assigned to conditions or orders of conditions (Cook & Campbell, 1979).

With the use of the constructivist approach in teaching the topics for the fourth quarter, the researchers remediated and then evaluated the performance of the thirty-two pupils of the Grade Four level.

The researchers administered the pre-test before the implementation of Project APT.

To ensure the validity of the results, the researcher requested permission from the principal to carry out the research and administer the survey part of the tool. They also administered the pre-test so that they could be able to track the improvement.

C. Data Analysis Plan

The questionnaire was peer validated for correctness of grammar and contest. The data gathering was carried out in accordance with ethical standards and for the preservation of all respondents' rights, who were treated justly and fairly. Ethical issues of autonomy, beneficence and confidentiality were considered in this study. The researcher followed the objectives, procedures and projected benefits of this research which were clearly and methodologically laid down for the respondents. The researcher also observed several ethical considerations such as the confidentiality and the Data Privacy Act.

The weighted mean was used to determine the extent of the responses in the questionnaire. The responses in the questionnaire were treated with weighted mean to find the extent. For certain items in the questionnaire, the likert-type scale below was used:

Range	Description	Scale
4	- Strongly Agree (SA)	3.01 – 4.00
3	- Agree (A)	2.01 – 3.00
2	- Disagree(D)	1.01 – 2.00
1	- Strongly Disagree (SD)	0.01 – 1.00

Similarly, a comparison of the performance of pupils in the pre-test and post-test results was done to determine the increase or decrease in the grades obtained.

2. DISCUSSION OF RESULTS AND REFLECTIONS

1. The Needs of Pupils in Learning Mathematics 4

Table 1 presents the needs of pupils in learning Mathematics 4.

Table 1- The Needs of Pupils in Learning Mathematics 4

Needs in learning Mathematics 4	Weighted Mean	Interpretation	Rank
1. Sufficient understanding of the subject matter.	3.93	Strongly Agree	4
2. 2. Explanation of abstract concepts.	3.875	Strongly Agree	5
3. 3. Further application of concepts to our daily lives.	4.0	Strongly Agree	1.5
4. 4. Patience in explaining what we do not understand.	3.81	Strongly Agree	7
5. 5. Promotion of our skills and subject mastery through hands-on lessons	3.96	Strongly Agree	3
6. 6. Promotion of our knowledge through self-guided learning.	3.84	Strongly Agree	6
7. 7. Make us actively involved in the process of meaning and knowledge construction	4.0	Strongly Agree	1.5
Composite Mean	3.91	Strongly Agree	

Range	Description	Scale
4	- Strongly Agree (SA)	3.01 – 4.00
3	- Agree (A)	2.01 – 3.00
2	- Disagree(D)	1.01 – 2.00
1	- Strongly Disagree (SD)	0.01 – 1.00

It is shown in the table that the composite mean obtained by the needs of pupils in learning Mathematics 4 was 3.91 interpreted as Strongly Agree.

First in rank were Indicator 3 “Further application of concepts to our daily lives,” and Indicator 7 “Make us actively involved in the process of meaning and knowledge construction,” which both obtained a composite mean of 4.0 (Strongly Agree). Indicator 5 “Promotion of our skills and subject mastery through hands-on lessons,” followed with a mean of 3.96 (Strongly Agree) with Indicator 1” Sufficient understanding of the subject matter” falling closely behind with a mean of 3.93 (Strongly Agree). Fifth rank was obtained by Indicator 2” Explanation of abstract concepts,” which obtained a mean of 3.875 (Strongly Agree). Indicator 6 “Promotion of our knowledge through self-guided learning,” and Indicator 4” Patience in explaining what we do not understand,” followed with 3.83 and 3.81 respectively (Strongly Agree).

These findings revealed that the Grade Four pupils have recognized their needs in order for them to learn Mathematics which are further application of concepts, active involvement in the process of meaning and knowledge construction, promotion of skills and subject mastery, sufficient understanding of the subject matter, through explanation of abstract concepts and through self-guided learning.

From these findings, it is deduced that the children, apart from being young, were already aware of their needs in order to learn.

The Benefits Derived From The Use Of The Project APT (Adoptive Pedagogical Techniques)

Table 2 presents the benefits derived from the use of the project APT (Adoptive Pedagogical Techniques).

Table 2

The Benefits Derived from the Use of the Project APT (Adoptive Pedagogical Techniques)

Benefits Derived	Weighted Mean	Interpretation	Rank
2. 1. Our own construction of knowledge through experiences and activities.	3.96	Strongly Agree	2
3. 2. Our sufficient understanding of the subject matter.	4.0	Strongly Agree	1
3. Our understanding of explained abstract concepts.	3.93	Strongly Agree	3
4. Our further application of concepts to our daily lives.	3.84	Strongly Agree	4
5. Teachers’ patience in explaining what we do not understand.	3.81	Strongly Agree	5
Composite mean	3.90	Strongly Agree	

Range	Description	Scale
4	- Strongly Agree (SA)	3.01 – 4.00
3	- Agree (A)	2.01 – 3.00
2	- Disagree(D)	1.01 – 2.00
1	- Strongly Disagree (SD)	0.01 – 1.00

It is apparent on the table that with regards to the benefits derived from the use of the project APT (Adoptive Pedagogical Techniques), the composite mean obtained by all the indicators was 3.90 interpreted as Strongly Agree.

First among the benefits was sufficient understanding of the subject matter, which obtained a mean of 4.0 (Strongly Agree). It was followed by their own construction of knowledge through experiences and activities, which obtained a mean of 3.96 (Strongly Agree).

Third rank was occupied by understanding of explained abstract concepts, with a mean of 3.93 (Strongly Agree) while further application of concepts to our daily lives got a mean of 3.84 (Strongly Agree). The last rank was obtained by teachers’ patience in explaining what the pupils do not understand which obtained a mean of 3.81 (Strongly Agree).

These findings revealed that the pupils had already experienced the benefits from the use of Project APT (Adoptive Pedagogical Techniques) as they learn better the subjects in Mathematics.

From these findings, it is deduced how much benefit the pupils derived from the use of the Project APT.

3. The performance of Grade Four pupils in Mathematics before and after the administration of Project APT (Adoptive Pedagogical Techniques).

Table 3 presents the performance of Grade Four pupils in Mathematics before and after the administration of Project APT (Adoptive Pedagogical Techniques).

Table 3

The Comparison of the performance of Grade Four pupils in Mathematics before and after the administration of Project APT (Adoptive Pedagogical Techniques).

Pupils	Summary of Grades Obtained during the First Quarter	Summary of Grades Obtained during the Fourth Quarter	Increase/Decrease in Grades
Males	86.4	89.2	2.8
Females	84.63	87.09	2.46
Average	85.51	88.14	

The grades obtained by the pupils obviously increased during the fourth quarter as the table showed by increase. The males had higher increase than the females. Still, a remarkable increase was notable in the subject of Mathematics.

From these findings, it is deduced that the Project APT has done a better job in increasing the grades in Mathematics.

Reflections

From the findings of the study, the following conclusions were arrived at:

1. The Grade Four pupils have recognized their needs in order for them to learn Mathematics which are further application of concepts, active involvement in the process of meaning and knowledge construction, promotion of skills and subject mastery, sufficient understanding of the subject matter, through explanation of abstract concepts and through self-guided learning.
2. The pupils had already experienced the benefits from the use of Project APT (Adoptive Pedagogical Techniques) as they learn better the subjects in Mathematics.
4. Project APT has done a better job in increasing the grades in Mathematics.

3. RECOMMENDATIONS

From the foregoing conclusions, the following are recommended:

1. The school should continue the administration of Project APT to secure the learning of the pupils.
2. Other grade levels may adopt the pedagogy in teaching Math to their respective grade level.
3. Parents and the school may work collaboratively to support the learning of pupils.

Action Plan

Objectives	Activities	Future Plans	Time Frame	Persons Involved
To organize the Constructivism pedagogical approach	Research and organization of the pedagogy	Ask for approval of the school head		School Head Proponents
	Organization of basic math lessons for incorporation	Finalization		Proponents
To implement the pedagogy to Math lessons	Actual implementation	Assessment of the output		Teachers Proponents
To monitor the implementation	Monitoring and Evaluation	Monitor and evaluate the implementation Reporting	January-April 2025	M and E Team

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