



# Padlet application and learning of the area of mathematics in students of the fifth grade of secondary school at IE Vitarte

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## Abstract

The present research work entitled Padlet Application and Learning of the Mathematics Area in Fifth Grade Secondary Students at IE Vitarte, had as a result a favorable influence on the learning of mathematics when applying the Padlet application and the parametric statistic was used Student's t for independent groups. The result of the \* p value in each case was 0.000 and less than 0.05: therefore the alternative hypotheses are accepted and the corresponding null hypotheses are rejected. Based on the results obtained, it was concluded, at a 95% confidence level, that the Padlet application significantly improves the learning of the mathematics area in students of the fifth grade of secondary school at IE Vitarte, as evidenced in the hypothesis contrast ( $\text{sig.} = 0.000 < 0.05$ ).

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**Keywords:** collaborative; competence; Mathematics learning; motivation; padlet application

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## 1.

### Introduction

Today, in the globalized world, digital technology is the sign of all human activity. Society and culture have been transformed, and education is no stranger

to changes, especially in scientific and technological knowledge, in such a way that it is lived in a social context called "the knowledge society". It is also one of the paradigms of advanced education.



The teacher, the student and society as a whole must manage technological resources (ICT) in order to apply them in everyday life and work. The present research addressed the use of an application called Padlet which is an interactive whiteboard panel that allows you to interact, virtually, in the teaching-learning process. In this case, the Padlet was applied to the learning of the mathematics area in the students of the fifth grade of secondary education of El Vitarte.

The research is dosed in five chapters: in the first chapter, it deals with the determination of the problem; the problem and the real situational context are described, the problem is formulated, the importance of its study and the limitations it faces. In the second chapter, the theoretical framework is addressed, the background of research at the international and national level, all of them related to the research topic; in addition, the theoretical bases are defined the basic terms.

In the third chapter, the hypotheses are raised, because it is an experimental research, also the variables of corresponding studies are operationalized. In the fourth chapter, the methodological aspect is reported, where the approach, design and method of the research is explained; then, the population is described, the sample; the technique and instruments that were used for data collection are also explained. Finally, in the fifth chapter, the results and the conclusions are reported.

### 1.1 Background to the investigation

In the investigation and collection of information, it has been possible to find similar international and national investigations:

Area (2010). The process of integration and pedagogical use of ICT in schools in Spain. The objective was to analyze the process of pedagogical integration of ICT in the E/A process of basic and secondary education centers. The conclusion was that ICTs incorporate organizational changes of the classroom, framing the importance of the teacher's attitude in order to use them and turn them into potential resources for learning.

Ismail, (2021), in the paper: The effectiveness of using the Padlet platform in the development of some critical thinking skills for students of the faculty of education. The results of the research showed statistically significant differences (0.05) between the mean scores of the sample in the administration of the pre and post test of critical thinking skills, coming out in favor of the post test. The use of the Padlet also showed a marked improvement in critical thinking skills. The author of the research paper recommended that the technical capabilities of the Padlet are effective and that the platform should be used and employed in the education and training process.

Cabañas and Ojeda (2003) completed the thesis entitled: Virtual classrooms as a support tool in education at the Universidad Nacional Mayor de San Marcos. The authors conclude that the study in the classrooms of pedagogical innovation allows a better development of the capacity for acquisition, the capacity for teamwork and learning strategies.

Choque (2009) carried out the thesis entitled: Study in Classrooms of pedagogical innovation and development of ICT capacities, doctoral thesis supported at the Universidad Nacional Mayor de San Marcos. In it he concluded that the study in the classrooms of



pedagogical innovation allowed an improvement in the development of the capacity to acquire information, because students interact better with THE TIC; a greater development of the capacity of learning strategies was achieved; and also allowed a greater development and integration of the capacity for teamwork.

**1.2 The advantages of Padlet in online education**

The simplicity of Padlet makes it easy for students to participate in projects. With Padlet, security is guaranteed since it is the teacher who is responsible for managing the access permissions to the participants, as well as the control of the privacy of the projects. These can even be password protected, as well as hidden from Google searches. Collaborative evaluation is possible with Padlet, by using the "Reward" option with stars,

votes, ratings or hearts. This is a good exercise to encourage "feedback" among peers, however, it is the teacher who must accompany this process to obtain positive results. With this tool, it is possible to participate anonymously, which can allow the teacher to encourage participation in a more free and inclusive way, especially for those who do not usually contribute much in this type of collaborative activities.

**1.3 Theoretical bases of the variable learning of mathematics**

According to Parra and Flores (2008), the learning of mathematics, in the context of problem solving, is a process that requires teachers and students to adopt forms of interaction that promote the understanding of problems and, at the same time, explore various forms of solution.

**Table 1.**Mathematical Competencies and Implications

Competencies	Implications
Competition 1: Solve quantity problems	Translate quantities to numeric expressions Communicates your understanding of numbers and operations Use calculation estimation strategies and procedures
Competition 2: Solves problems of regularity, equivalence and changes	Argues claims about numerical relationships and operations Translate data and conditions into algebraic expressions and graphs Communicates your understanding of algebraic relationships Use strategies and procedures to find equivalences and general rules Argues claims about exchange relations and equivalence
Competition 3: Solves problems of form, movement and location	Model objects with geometric shapes and their transformations Communicates your understanding of geometric shapes and relationships Use strategies and procedures to orient yourself in space Argues claims about geometric relationships
Competition 4: Solves data management problems and uncertainty	Represents data with statistical or probabilistic graphs and measures Communicates your understanding of statistical and probabilistic concepts Use strategies and procedures to collect and process data Supports conclusions or decisions based on the information obtained.

**Fountain:**Adapted from the mathematical area of MINEDU (2016, p. 21).

**1.4 Definition of basic terms**

Mathematical Competence. "It is a knowing how to act in a particular



context, which allows solving real problematic situations or mathematical context" MINEDU (2014, p. 14).

Problematic situation. "A problematic situation is a difficult stage before which we must seek and reflexively give a coherent response, find a solution." MINEDU (2014, p. 14).

**2. Methodology**

The research is quantitative, since the researcher measures the variables and expresses the results of the measurement of numerical values. You can measure intelligence, academic performance, height, anxiety levels, etc. The scientific ideal is oriented towards the quantification of all variables and the efforts of science are directed in this direction (Mejía, E. 2005).

The type of research will be experimental, in this sense it is aimed at demonstrating the effectiveness of teaching with the virtual padlet application.

The design used in the research is the "pre experimental", specifically the so-called "design before and after with an experimental group" is useful to determine if there were changes in behavior of the individuals in the sample between their initial state, measured by the Pre test or Input Test, and the subsequent situation, measured by the Post Test or Exit Test.

**Equation 1.** Experimental group.

**GE: O1 X O2**

Where:

X = Experiment.

GE = Experimental group.

O1 O2 = Observation of input and output to the experimental group

The scientific method (hypothetical-deductive) was used, since it begins with the identification and formulation of problems, objectives and hypotheses; research instruments are then developed and applied to the sample, the data are obtained and statistically processed for hypothesis testing.

The population or universe is made up of all the students of the fifth grade of secondary school of the I.E. Vitarte who are approximately 180 students. The sample was chosen two groups of 28 students.

The instruments to consider are: Observation Sheets, Written Exams. (Pre Test and Post Test). Two instruments were used to measure the second variable: a pre-test and a post-test that are tests applied at the beginning and end of the experimental group.

**3. Instrument validation**

The judges' trial determined, according to the indicators, the relevance of the investigative instruments and their applicability. In this regard, the judges considered that there is coherence between the criteria and objectives of the research and the items built in the instruments for the collection of information. The following table is shown:

**Table 2.** Level of Validity of the Instrument according to Expert Judgment

Nº	e(s) and Surnames of the Expert	st and post-test score
1	Dr. Caballero Cifuentes, Lolo José	90
2	Dr. Huamani Escobar, Willian Alberto	88
3	Dr. ValenzuelaCondori, Juan Carlos	92



<b>4</b>	Dr. Fermadez Saucedo, Narciso	90
	<b>scoreandaveragerating</b>	90

**4. Results**

The result obtained in the pres test of the Kuder-Richardson coefficient 21 is equal to 0.52. This means that the instrument has moderate reliability because it is on the scale of 0.41 to 0.60. Therefore, this instrument presents internal consistency.

The result obtained from the coefficient in the Kuder-Richardson 21 post-test is equal to 0.63. This means that the instrument has high reliability because it is on the scale of 0.61 to 0.80.

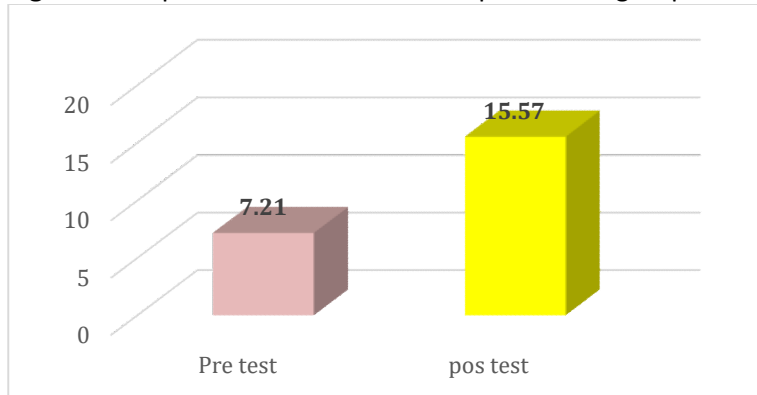
Therefore, this instrument presents internal consistency. In the descriptive analysis, the data obtained after applying the Pre test and Post test were analyzed, It was evident that the average of the pre-test of the experimental group was 7.21 (Deficient) and the average of the post test, when applying the Padlet application for was 15.57 (Good), which shows a favorable influence on the learning of the area of mathematics with the application of the Padlet application in the students of the fifth grade of secondary school of IE Vitarte.

**Table 3.** Comparison of Averages of Start and Exit Exams of the Experimental Group

Groups	Beginning	Exit
Experimental Group	7,21	15,57

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**Figure1.** Comparison of means of the experimental group in Pre test or Post test



It is observed in Figure 1, that the mean of the pre-test of the experimental group was 7.21 (deficient) and the mean of the post test, when applying the Padlet application was 15.57 (good),

which demonstrates an influence favorable in the learning of the area of mathematics in the students of the fifth grade of secondary school of eiVitarte.



**Table 4.** Descriptive Statistics of the Dependent Variable: Learning the area of Mathematics

Statistics descriptive	GE Pre Test	GE Pos test
Media	7.21428571	15.5714286
Median	7	16
Mode	7	16
Deviation standard	1.59529732	0.87891227
Sample variance	2.54497354	0.77248677
Rank	6	3
Minimal	4	14
Maximum	10	17
Sample	28	28

In the General Hypothesis Test the non-parametric statistic U Mann Whitney was applied where it can be observed that sig. asymptotic = 0.000 < = 0.05 (5% level of significance) so it is rejected from the null hypothesis, so we are in the condition of accepting the alternate hypothesis Ha for any level of significance.

As for the hypothesis test specifies1 the non-parametric statistic U Mann Whitney is 7.5 and it is also observed that sig. asymptotic = 0.000 < = 0.05 (5% level of significance) so it is rejected from the null hypothesis, so we are in the condition of accepting the alternate hypothesis Ha for any level of significance

As for the hypothesis test specifies2 the non-parametric statistic U Mann Whitney is 3.0 and it is also observed that sig. asymptotic = 0.000 < = 0.05 (5% level of significance) so it is rejected from the null hypothesis, so we are in the condition of accepting the alternate hypothesis Ha for any level of significance.

The hypothesis test specifies3 the non-parametric statistic U Mann Whitney is 23.5 and it is also observed that sig. asymptotic = 0.000 < = 0.05 (5% level of significance) so it is rejected from the null hypothesis, so we are in the condition of accepting the alternate hypothesis Ha for any level of significance

The hypothesis test specifies4 the non-parametric statistic U Mann Whitney is 51 and it is also observed that sig. asymptotic = 0.000 < = 0.05 (5% level of significance) so it is rejected from the null hypothesis, so we are in the condition of accepting the alternate hypothesis Ha for any level of significance.

## 5. Discussion

The results of the research, the significant influence of the Padlet application on the learning of the area of mathematics in the students of the fifth grade of secondary school of the I.E. Vitarte is evidenced, also the results of the research demonstrate that the effectiveness of the application of Padlet, is observed in the experimental group, in the access test or pre-test, the mean that is evidenced to be 7.21 and in the post-test test was 15.57 in that sense, there is a constant substantial improvement in the academic level of the students at the inferential level, the hypothesis tests are favorable both in the general and in the specific tests that were tested using the non-parametric statistical test U Mann Whitney for independent samples with non-normalized data.



Likewise, also in the conclusions of: Choque (2009) Thesis entitled "Study in Classrooms of Pedagogical Innovation and development of ICT capacities". Doctoral Thesis supported at the Universidad Nacional Mayor de San Marcos. It concludes that the study in the classrooms of pedagogical innovation allowed an improvement in the development of the ability to acquire information because students interact better with ICT, a greater development of the capacity of learning strategies was achieved, it also allowed a greater development and integration of the capacity for teamwork.

## 6. Conclusions

The results obtained in the research, it was concluded at a confidence level of 95% that the application of the padlet significantly improves the learning of the mathematics area in fifth grade students of secondary school at IE Vitarte, is demonstrated with the general hypothesis of contrast (sig. = 0.000<0.05). In the first specific hypothesis, it is concluded at a confidence level of 95% that the Padlet application significantly improves the competence solves quantity problems in the area of mathematics in fifth grade students of secondary school at IE Vitarte, as demonstrated with the contrast hypothesis (sig. = 0.000<0.05). In the second specific hypothesis, it is concluded at a confidence level of 95% that the Padlet application significantly improves competence solves problems of regularity, equivalence and changes in the area of mathematics in fifth grade students of secondary school at IE Vitarte, it is demonstrated with the specific hypothesis of contrast (sig. = 0.000 <0.05). In the last specific hypothesis, it is concluded at a confidence level of 95% that the Padlet application significantly

improves the competence solves problems of form, movement and location of the mathematics area in fifth grade students of secondary school at IE Vitarte, as demonstrated with the contrast hypothesis (sig. = 0.000 <0.05). From the third specific hypothesis of the research, it is concluded at a confidence level of 95% that the Padlet application significantly improves competence solves data management problems and uncertainty in the area of mathematics in fifth grade high school students at IE Vitarte, as demonstrated by the last specific contrast hypothesis (sig. = 0.000<0.05).

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