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Social networks and the learning of mathematics in times of the covid 19 pandemic in students of the faculty of mining engineering of the National University "Santiago Antúnez de Mayolo" - semester 2020-II - Huaraz, 2022

[Las Redes sociales y el aprendizaje de las matemáticas en tiempos de la pandemia del covid 19 en estudiantes de la facultad de ingeniería de minas de la Universidad Nacional “Santiago Antúnez de Mayolo” - semestre 2020-II - Huaraz, 2022]

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Resumen

El objetivo de la investigación es determinar la relación que existe entre las redes sociales y el aprendizaje de la matemática en tiempos de pandemia Covid 19 en estudiantes de la Facultad de Ingeniería de Minas de la Universidad Nacional “Santiago Antúnez de Mayolo” semestre 2020-I-Huaraz, 2021. La investigación es tipo descriptivo, método cuantitativo y diseño descriptivo correlacional; se aplicaron dos instrumentos: encuesta validados por dos expertos, aplicados a una muestra de 80 estudiantes. Las variables analizadas redes sociales y aprendizaje de la matemática, en cuya investigación se formuló una hipótesis afirmativa y una hipótesis nula.Después de analizar los resultados, se afirma que sí existe una relación significativa entre las redes sociales y el aprendizaje de la matemática, quedando corroborado la hipótesis afirmativa. La verificación de la hipótesis fue hecha aplicando el Chi cuadrado. De manera que se concluye, que si existe relación significativa entre redes sociales y el aprendizaje de la matemática en tiempos de pandemia Covid 19 en estudiantes de la Facultad de Ingeniería de Minas de la Universidad Nacional “Santiago Antúnez de Mayolo” semestre 2020-I-Huaraz, 2021.

Palabras clave: Redes sociales, pandemia, aprendizaje conceptual, aprendizaje procedimental, aprendizaje actitudinal.

Abstract

The objective of the research is to determine the relationship that exists between social networks and the learning of mathematics in times of the Covid 19 pandemic in students of the Faculty of Mining Engineering of the National University "Santiago Antúnez de Mayolo" semester 2020-I - Huaraz, 2021.The research is descriptive type, quantitative method and correlational descriptive design; Two instruments were applied: survey validated by two experts, applied to a sample of

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80 students. The variables analyzed social networks and learning of mathematics, in whose investigation an affirmative hypothesis and a null hypothesis were formulated. After analyzing the results, it is stated that there is a significant relationship between social networks and mathematics learning, confirming the affirmative hypothesis. The verification of the hypothesis was done by applying the Chi square. So it is concluded that if there is a significant relationship between social networks and the learning of mathematics in times of the Covid 19 pandemic in students of the Faculty of Mining Engineering of the National University "Santiago Antúnez de Mayolo" semester 2020-I- Huaraz, 2021.

Keywords: Social networks, pandemic, conceptual learning, procedural learning, attitudinal

I. Introduction

The situation we are currently experiencing of a health emergency, as well as an educational one, is historic. The educational service without distinction of level, closed its doors for an indefinite period, interrupting its face-to-face activity. In addition, unexpectedly and immediately, literally from one day to the next, students and teachers must remain at home due to the impossibility of returning to the classroom for an indeterminate period of time. Nothing was planned; no one could have imagined a situation of such magnitude. And yet, health reasons and common sense recommended starting to think about how educational work could be continued away from physical classrooms.

Given the confinement for a certain time, it made us see that there are difficult aspects to manage and problems that, although they had existed for a long time, were reflected with much more intensity and more frequently, in some cases, more harshly. As it has always been throughout the history of education, there is a modality that, although it has often been disdained by the majority, has always performed its function as a compensatory educational mechanism, with the intention of seeking an equitable balance for those people that they could not access face-to-face education that higher education institutions regularly offered. Distance education, or non-face-to-face education, has been a form of salvation for those situations in which the impossible coincidence of teachers and students in space or time, or both, prevented access to education for individuals and collective. (Guash, 2020).

It can be said that, at this point, the non-face-to-face education modality that can currently provide this ability to overcome the social distance caused by the Covid 19 pandemic is remote education. And it cannot be said that it is better than face-to-face education. Simply because, at certain times, like the one we are still living through, we have no other alternative than remote education. Based on this problem, webinars began to be created that were aimed at teachers who needed to implement online teaching solutions with their students due to confinement due to the COVID-19 pandemic, solutions that have always been said were not proper online education, because there was no time to plan or design them, but they could allow remote teaching or emergency non-face-to-face teaching to be addressed as potential transition processes from face-to-face education to practical, well-founded and effective online education models, and that they were consistent from the point of view of the online learning situation.

Basically, the concern is that learning mathematics is complex for most students at all educational levels and much more so in university higher education, in addition to the above, classrooms are currently full of technological students, most of them he was born and raised, almost literally, with technology under his arm. That is why the teacher should not be left behind in the use of technological resources for teaching, being a challenge to develop strategies that arouse the student's interest in learning in the new digital environments.

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In fact, the teaching of mathematics has already been facing a worrying problem in the Peruvian educational system, which is exacerbated by the current pandemic situation. Thus, it is observed, for example, that the current curricula are committed to an unreal teaching, where the student does not develop basic skills in their training for their professional life, since these are fundamentally based on mere repetition, routine and memorization. In some cases, for example, the topics are developed without any requirement and the critical and creative capacity of the students is not exercised nor the use of mathematical models applicable to the professional field in which the students have to develop. In this sense, social networks are ideal tools that teachers and students can use for meaningful learning of mathematics.

The teaching of mathematics has been facing a worrying problem in the Peruvian educational system, which is exacerbated by the current situation (the UNASAM is not exempt from this aggravating situation). Thus, it is observed, for example, that current curricula are committed to objective-based teaching, where the student does not develop basic skills in their training for their professional life, since these are fundamentally based on repetition and memorization. In certain cases, the topics are developed without any requirement, focusing on the repetition of axioms, theorems, definitions or other theoretical concepts, relegating the interpretation of graphs, analytical expressions, mathematical models and their applications.

It is notorious that mathematics subjects, in many cases, are inconsequential for some students. This is reflected in the high rate of failures, resulting in the student even beginning to resent the subject or an almost pathological fear of failing the course; when, on the contrary, the student should generate good learning expectations and enough confidence to face more advanced courses. It is important to highlight that, if adequate methodological teaching strategies are not implemented in mathematics courses, students will not be able to develop significant learning and this will result in poor academic performance and a negative impact on their self-esteem. We must take into account that, in many cases, the disapproval of basic mathematics courses in the first cycles of university studies determine their permanence in a certain professional career; causing, sometimes even, the retirement or change of career.

All the problems already mentioned are aggravated due to the fact that adequate didactic strategies are not used for the teaching of Mathematics. Likewise, the lack of volitional attitude to learn the subjects of the subject is evident, due to the lack of stimuli, because mathematical knowledge is not updated, because it is taught to memorize and not to create reflective and investigative thoughts, among others. In the training process, adequate didactic material is not used and the development of classes by competencies is not focused. When students do not develop significant learning, the effects are often irreversible because they tend to lose the goal of their professional career, it causes them insecurity and affects the commitment and responsibility they should have in their studies; this leads the student to repeat the course and puts him/her at academic risk and, in the worst case, leads to the student dropping out.

Social networks can be used for the teaching and learning of Mathematics. The teacher is in charge of linking these technological resources to their classes, and can also allow students to choose to learn in a meaningful way. The proper use of social networks in the area of Mathematics would encourage the active participation of students when solving problems or carrying out activities. That is why the present work aims to analyze the way in which social networks contribute to student learning in the area of Mathematics.

Several studies mention that social networks and digital platforms are essential within the area of Mathematics, such is the case of De la Hoz, Acevedo, and Torres, (2015) who affirm that "social networks help and allow students to connect to both formal and informal learning environments and that an informal knowledge exchange can also be organized for educational purposes" (p.78). We turn to these authors, because they have a close relationship with social networks and the

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objectives of the project, likewise we highlight authors such as Chóliz and Marco, (2012); who let us know the importance of the didactics of mathematics and its incidence that these have within social networks and digital platforms.

Social networks allow teachers and students to learn more about a topic, or the teacher through these means can create groups, assign tasks or send content more easily and have greater communication fluidity between teachers and students (Cruz, 2019). However, it should be noted that a good percentage of students responded that social networks contribute to their learning. Many times in social networks you can find valuable information for learning Mathematics, since you can meet people who support you to better understand the topics or simply watch classes that are broadcast live; this is what is called inverted education, that is, the student creates his own mechanisms for self-learning. Then, teachers must enhance the use and identify the strengths that social networks provide for educational purposes that facilitate the work of the teacher and thus capture the attention of students.

About the research work, there are some research works (correlational, quasi-experimental, and others), relatively related to this work, that is, works on social networks and learning of mathematics that will necessarily be taken into account in this work research.

For this, we consider some research works:
The author Altamirano, (2018) in his research work Collaborative learning and social networks. Ambato, master's thesis. He was kind enough to analyze how social networks influence collaborative learning. His approach was mixed, qualitative and exploratory. He had a sample of 32 students, for this, the author considered developing a questionnaire of 10 questions with the intention and purpose of collecting information. The results that the data yielded was a value of (p=0.0009 which is lower than the confidence level (0.05). This leads to the conclusion that there was a degree of influence between both variables, being related to one of the study variables, social networks.

Bendezú, (2020) "Social networks in the learning of the students of the fourth cycle of the Faculty of Education, UNMSM, Lima 2019. Whose research objective was: to determine the incidence that social networks have in the learning of the students of the fourth cycle of the Faculty of Education in the area of General Didactics, of the UNMSM Lima 2019, reaching the conclusion that there is no significant incidence of the use of social networks in learning in the students of the fourth cycle of the Faculty of Education, saving relationship with one of the study variables of our research proposal.

It is the responsibility of mathematics teachers to analyze the situation they want to improve and identify if social networks are the best solution; if so, make the most of their capacities and coverage, so that the generations of students who are currently in the classroom can have access to content and tools that help them achieve their learning objectives and graduate much better prepared. Given these considerations, we see ourselves in the urgent need to ask ourselves the following question: What relationship exists between social networks and the learning of mathematics in times of the Covid 19 pandemic in students of the Faculty of Mining Engineering of the National University "Santiago Antúnez de Mayolo”-semester 2020-I- Huaraz, 2021?

II. Materials and Methods

Type of research

This research is non-experimental type, descriptive method. It is descriptive because it allows specifying the important properties of people, groups, communities or any other phenomenon that has been subjected to analysis and correlational or its purpose and usefulness is to know how a

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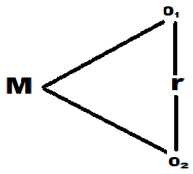
variable can behave knowing the behavior of another related variable, that is attempt to predict the approximate value that a group of individuals will have on a variable, based on the value they have on the related variable or variables

Research design
The research design can be defined as a schematic structure or organization adopted by the researcher to relate and control the study variables. "It serves as an instrument of direction and restriction for the researcher, in this sense, it becomes a set of guidelines under which an experiment or study is going to be carried out." (Hernandez, 2010).

To achieve the stated objectives and to analyze the certainty of the formulated hypothesis, the research design is of a non-experimental type, specifically transversal-descriptive correlational, whose scheme is:



Where:
M: Represents the students that make up the sample
O1: Social networks
r: Degree of relationship that exists between the study variables.
O2: Mathematics learning

Sample population
In the present research work, the study population is considered to be the students of the Faculty of Mining Engineering of the first and second year of studies. The students of the first and second year are an average of 80, which constitute 100%; so the sample is census.

Data collection techniques
• Survey: Two surveys were applied, with a questionnaire of 15 questions for each survey, which allowed us to measure the relationship between social networks and the learning of mathematics, this instrument was validated by experts before applying it. It was also to collect information from students and standardize their computer treatment for statistical analysis.

Information processing techniques
• The analysis of the data and its interpretation obtained from the information, the data was organized through a tabulation matrix in Excel and SPSS v.20.
• Interpretation of the relationship between both variables.
• Determine the degree of generalization of the research results.
• Comparative tables: Systematize the information and contrast the elements of the correlation between social networks and the learning of mathematics.
• Describe the characteristics of the object of study.

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III. Results

In accordance with the objectives set forth in this research, the results are shown through the table, which are the reflection of the evaluation carried out by the teacher through a single survey. Table 1. Relationship between social networks and the learning of mathematics in times of the Covid 19 pandemic in students of the Faculty of Mining Engineering of the National University "Santiago Antúnez de Mayolo" semester 2020-I.

			Social networks			
			Low	Medium	High	Total
Learning	Low	Frequency	3	2	1	6
		Percentage	2,5%	1,7%	0,8%	5,0%
	Medium	Frequency	44	5	1	50
		Percentage	36,4%	4,1%	0,8%	41,3%
	High	Frequency	2	60	3	65
		Percentage	1,7%	49,6%	2,5%	53,7%
Total		Frequency	49	67	5	121
		Percentage	40,5%	55,4%	4,1%	100,0%

Spearman's Rank Correlation Coeficient	$\rho = 0{,}722$	**P**= 0,000< 0.05 Significant

Description: In table 1, the two study variables were crossed, from which we can say that 53.7% of the students show that their learning level is high, 41.3% state that the learning level is medium and only 5% indicate that their learning level is low. Likewise, it can be seen that 55.4% of the students indicate that their level of use of social networks is medium, 40.5% indicate that they use their social networks at a low level and only 4.1% do so used at a high level.

However, we can point out that 49.6% show that their level of learning is high and they use their social networks at a medium level, 36.4% show that their level of learning and the level of use of social networks is medium, 4.1% show that their level of learning and the level of use of social networks is medium, 2.5% show that their level of learning and the level of use of social networks is low, with the same percentage shows that their level of learning and the level of use of social networks is high, 1.7% show that their level of learning is high and they use their social networks at a low level, while 0.8% show that their level of learning is low and they use their social networks at a high level with the same percentage shows that their level of learning is medium and they use their social networks at a high level. The correlation analysis shows that there is a high positive correlation between social networks and mathematics learning during the pandemic, with a significance level of less than 0.0001.

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Table 2: Relationship between the learning of mathematics in the dimension under the use of social networks

			Low use dimension			
			Low	Medium	High	Total
Learning	Low	Frequency	3	2	1	6
		Percentage	2,5%	1,7%	0,8%	5,0%
	Medium	Frequency	38	11	1	50
		Percentage	31,4%	9,1%	0,8%	41,3%
	High	Frequency	3	59	3	65
		Percentage	2,5%	48,8%	2,5%	53,7%
Total		Frequency	44	72	5	121
		Percentage	36,4%	59,5%	4,1%	100,0%

Spearman's Rank Correlation Coeficient	$\rho = 0{,}626$	**P**= 0,000< 0.05 Significant

Description: In table 2, we can say that 59.5% of the students indicate that the level of use of social networks is medium, 36.4% indicate that they use social networks at a low level and only 4.1% use it to a high level.

Likewise, we can point out that 48.8% show that the level of learning is high and they use social networks at a medium level, 31.4% show that their level of learning is medium and the level of use of social networks is low, 9.1% show that their level of learning and the level of use of social networks is medium, 2.5% show that their level of learning is high and the level of use of social networks is low, with the same percentage shows that their level of learning and the level of use of social networks is high, 1.7% show that their level of learning is low and they use social networks at a medium level, while 0.8 % shows that the level of learning is low and they use social networks at a high level with the same percentage showing that their level of learning is medium and they use social networks at a high level.

According to the results of the Spearman correlation test between the learning of mathematics in the dimension under the use of social networks, there is a correlation coefficient of 0.626, indicating that there is a moderate positive correlation, the value of bilateral significance (Sig.) is 0.0001. Therefore, we can conclude that there is a relationship between the learning of mathematics in the dimension under the use of social networks.

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Table 3: Evaluate the relationship between learning mathematics in the moderate use of social networks dimension

			Moderated use dimension			
			Low	Medium	High	Total
Learning	Low	Count	4	1	1	6
		% of total	3,3%	0,8%	0,8%	5,0%
	Medium	Count	37	12	1	50
		% of total	30,6%	9,9%	0,8%	41,3%
	High	Count	3	59	3	65
		% of total	2,5%	48,8%	2,5%	53,7%
Total		Count	44	72	5	121
		% of total	36,4%	59,5%	4,1%	100,0%

Spearman's Rank Correlation Coeficient	$\rho = 0{,}641$	**P**= 0,000< 0.05 Significant

Description: In table 3, we can say that 59.5% of the students indicate that the level of use of social networks is medium, 36.4% indicate that they use social networks at a low level and only 4.1% use it to a high level.

Likewise, we can point out that 48.8% show that the level of learning is high and they use their social networks at a medium level, 30.6% show that their level of learning is medium and the level of use of social networks is low, 9.9% show that their level of learning and the level of use of social networks is medium, 3.3% show that their level of learning and the level of use of social networks is low, the 2.5% show that their level of learning is high and the level of use of social networks is low, with the same percentage showing that their level of learning and the level of use of social networks is high, 0.8 % shows that their level of learning is low and they use their social networks at a medium level, with the same percentage it shows that their level of learning is low and they use their social networks at a high level, it also shows that their level of learning is medium and they use their social networks at a high level.

According to the results of the Spearman correlation test between the learning of mathematics in the dimension under the use of social networks, there is a correlation coefficient of 0.641, indicating that there is a moderate positive correlation, the value of bilateral significance (Sig.) is less than 0.0001. Therefore, we can conclude that there is a relationship between learning mathematics in the moderate use of social networks dimension.

IV. Conclusions

- The correlation analysis shows that there is a high positive correlation between social networks and mathematics learning during the Covid 19 pandemic, with a significance level of less than 0.0001. Therefore, we can conclude, there is a positive relationship between learning mathematics and social networks.

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- According to the hypothesis raised, it turned out to be true, since the research work shows an existence of empirical evidence, there is a significant relationship between social networks and the learning of mathematics in students from Minas, in times of Covid 19.

V. Acknowledge

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