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REMOTE PROGRAMMED INSTRUCTION AND TUTORIAL AS STRATEGIES IN THE LEARNING PROCESS FOR THE DEVELOPMENT OF MATHEMATICAL COMPETENCES.

LA INSTRUCCIÓN PROGRAMADA REMOTA Y EL TUTORIAL COMO ESTRATEGIAS EN EL PROCESO DE APRENDIZAJE PARA EL DESARROLLO DE COMPETENCIAS MATEMÁTICAS.

Carlos A. Camacho[1] , Sandro J. Pérez[2] Kennedy Hurtado[3]

[1,3]Universidad del Atlántico. [2]Universidad Privada Dr. Rafael Belloso Chacín

[1]carloscamacho@mail.uniatlantico.edu.co; [2]perezsanndro@gmail.com; [3]kennedyhurtado@mail.uniatlantico.edu.co

Resumen

El objetivo de la investigación es determinar la importancia en el uso de la instrucción programada remota y del tutorial como estrategias en el proceso de aprendizaje para el desarrollo de competencias matemáticas en estudiantes de la media de Instituciones Educativas del Distrito de Barranquilla, Colombia. Dada la situación actual de una educación a distancia remota provocada por la pandemia del virus Sars Cov 2, conocido como Corona Virus, Covid 19, ha tenido un impacto en el tejido de la realidad humana a nivel planetario, sobre todo por las condiciones sanitarias que presentan las comunidades a nivel local, regional, nacional y mundial, en consecuencia, las instituciones educativas como organizaciones sociales han emigrado en estos tiempos a una modalidad de estudio virtual. En ese sentido, el papel que juega la escuela en este contexto actual, sus docentes y padres de familia ha sido determinante para enfrentar esta formación desde el hogar, donde las tecnologías son las herramientas que permiten establecer la conexión directa con los estudiantes. Metodológicamente, la investigación fue descriptiva – De campo, con un diseño no experimental, transaccional, con un análisis descriptivo e inferencial. La población estuvo constituida por 140 estudiantes de undécimo grado. Se encontró que los *estudiantes de undécimo* grado se destacaron en la categoría alta, cuando se trata de utilizar herramientas tecnológicas valiéndose de la Instrucción Programada Remota (IPR) y el tutorial en la resolución de problemas matemáticos. Se concluye que el empleo de las tecnologías bajo la modalidad remota virtual promueve resultados favorables en la formación del estudiantado. Se recomienda establecer un currículo y contenidos en el área de matemáticas ajustados a las estrategias de aprendizaje mediante la enseñanza programada remota.

(1,3) Universidad del Atlántico, Facultad de Ciencias Básicas, Barranquilla, Colombia.

(2) Universidad Privada Dr. Rafael Belloso Chacín, Docente y Miembro de Comité Académico del Doctorado en Ciencias de la Educación, Maracaibo – Venezuela.

Palabras clave: Instrucción programada remota, educación a distancia, uso del tutorial**.**

Abstract

The objective of the research is to determine the importance in the use of the remote programmed instruction and the tutorial as strategies in the learning process for the development of mathematical competences in students of the middle school of Educational Institutions of the District of Barranquilla, Colombia. Given the current situation of remote education caused by the pandemic Sars Cov 2 virus, known as Corona Virus, Covid 19, has had an impact on the fabric of human reality on a planetary level, especially because of the health conditions of communities at the local, regional, national and global levels, educational institutions as social organizations have thus migrated to a form of virtual study. In this sense, the role that the school plays in this current context, its teachers and parents have been decisive to face this formation from the home, where the technologies are the tools that allow to establish the direct connection with the students. Methodologically, the research was descriptive – Field, with a non-experimental, transactional design, with descriptive and inferential analysis. The population consisted of 140 eleventh-grade students. It was found that the eleventh grade students stood out in the high category, when it comes to using technological tools using the Remote Programmed Instruction (IPR) and the tutorial on solving mathematical problems. It is concluded that the use of technologies under the virtual remote modality promotes favorable results in the training of students. It is recommended to establish a curriculum and content in the area of mathematics adapted to learning strategies through remote programmed teaching.

Keywords: Remote programmed instruction, remote education, use of the tutorial**.**

Introduction

The health emergency caused by the Sars Cov 2, has permeated all areas of human life, transforming social contexts into unpopulated areas limited by human contact; the education, which was naturally developed from a special site called school, where students regularly attend to meet their learning needs, is considered a scenario that enables their personal and academic development. This social environment also for some schoolchildren represents their second home, as it allows for personal and direct interaction with friends and classmates, allowing them to share, play and enjoy school activities; reality that, from the first quarter of 2020 changed due to the measures implemented by nations to create effective sanitary conditions against this scourge that plagues peoples worldwide.

With the arrival of the pandemic, it was forced to migrate from a face-to-face system to a remote one, now the meeting with classmates and teachers is no longer from the classroom but through a computer or a cell phone, supported with platforms and Apps that allow interaction in schedules planned by educational institutions, some digital connection tools are: Meets, Zoom, Big Blue Button, Teams, among others By remote means the teacher establishes synchronous communication from his own home with the student, who makes his connection from the place of his preference, being able to show his activities and academic commitments by means of slides, a guide or from a virtual board, the thematic axes, or

simply approach the learning process with the strategies relevant to the content and knowledge to be built.

It should be noted that this new home-based training context would form the new school during the declared pandemic from 27 March 2020, milestone in world and national history in which neither societies nor much less the school system, in particular, educational institutions were prepared, thus constituting a major challenge to face the social phenomenon that warned a major change in the mode of teaching.

In this sense, a number of problems that have a seat in the technologies began to emerge from this situation, thus seeing a weak technological infrastructure, lack of economic resources on the part of the Colombian state for school organizations, lack of computerized school equipment, limited teaching skills in the area of technologies and logistics to attend to this new accommodation, which involved changes in terms of the paradigm of teaching that had traditionally been practiced. In the face of these advent, the teaching and learning process was fractured to face this new reality in the educational field.

In spite of the fact that students in their daily lives interact with technological tools permanently, either because they have a mobile device or computer equipment they carry with them an innate domain that favors some in the process of teaching. However, with the arrival of the pandemic and the isolation by restriction of the natural freedoms of mobilization and social interaction, it revealed that by individualizing education from the homes, connectivity became the key element and necessary to achieve the goal proposed by the Colombian state to ensure the continuity of education from home, This was not possible due to the lack of a technological platform adapted to the training dynamics according to the needs of students and teachers.

Within this framework of assessments, Remote programmed instruction and the tutorial have been fundamental as strategies for the development of mathematical competences in secondary and secondary basic students of the different educational institutions at the local, regional and national levels. This merited that jointly governments, companies specialized in this issue of connectivity, and authorities join efforts in allocating resources, advisories, different tools, to be able to carry out the required training processes under the virtual modality, facilitating the technological means, especially the use of platforms, computers, web memories, networks among others.

In addition, parents with economic opportunities have provided their children with mobile equipment or computers; while others have not been able to adapt their homes to these elements because of their limited resources, for them the school has made the academic process more flexible, identifying the students who do not have equipment to establish connectivity and in the subsequent development of the objectives

set at the level of the study program during the school year, hence the idea of designing guides in physics, the student accompanied by the parent could acquire the basic theoretical knowledge, as well as its practical exercise under the supervision of the teacher, who has the time to help the students to solve the proposed tasks.

Based on the ideas raised that focus the situation problem, this research aims to determine the importance in the use of remote programmed instruction and tutorial as strategies in the learning process for the development of mathematical skills, that allow to solve problems by applying logical operations consistent with mathematical thinking with the help of technological tools as a basis for consensual planning between teacher and student.

Among other goals proposed in the study, we have to identify learning strategies based on remote programmed instruction for the development of mathematical skills; and, characterize learning strategies based on the use of the tutorial for the development of mathematical competencies in teachers and students of eleventh grade in the district of Barranquilla.

Theoretical Compendia

The present research is based on the proposed objectives, variables of interest, indicators, actions, sub-actions and items, materialized in the questionnaires of questions and correlated with the problem question. In this sense, the background explained in Camacho and others (2018), the role and opportunities that the ICT provide to humanity especially to education for training from the basic secondary, middle and university, assisted by programmed instruction, tutorials and other basic tools. This process has been traumatic and complex in the adoption of these new tools in teaching learning processes from school or from home.

Remote Programmed Instruction (IPR)

The current health emergency caused by the Sars Cov 2 makes it possible to review the literature on the pedagogical techniques taught to reach students from home; We agree that the pedagogical model developed by Skinner (1962), his principles in the programmed instruction are adapted to the problem and that allows the student to learn according to their individual rate, which is difficult in the collective class in the classroom. According to Deterline (1969), programmed teaching is a technique by which the student learns by the active manipulation of didactic material.

For Dorrego (2011), the programmed instruction developed by Skinner is valuable to reach the large sectors of the student population, because it is a self-taught teaching technique that consists in the presentation of the subject to be taught in small didactics or thematic axes, followed by questions whose

immediate verification, if the answer is correct, contributes to strengthening the acquired knowledge, or if incorrect leads to the correction of the error immediately with the advice of the teacher.

However, the IPR points out that the presentation of the subject and its thematic axes developed in pandemic, would be done through promotion on platforms, in a synchronous way for those students who have sufficient connectivity and appropriate technological equipment for this. Another group of students would listen to the exposition of the thematic axes simultaneously through the radio or by WhatsApp.

Similarly, the IPR, would be done in an asynchronous way especially for the group of students who do not have any connectivity. May develop their thematic axes through Physical Guides, a procedure devised by educational institutions to meet this learning need of students disconnected from current communication networks, playing an important role for parents and/or caregivers.

The programmed instruction according to Dorrego (2011), has many advantages, allows the student to deepen topics from which he only receives the basic elements in the classroom and even may take specialized courses which the institution cannot provide at the corresponding level of study. The teacher if he uses, the Programmed Instruction in his course, is freed from routine tasks, such as the provision of information, memorization, review of previous learnings, being able to devote more time to complex aspects of the signage and greater personal supervision of students.

The usefulness of programmed instruction in the training and development of competencies from school, contributes to the simultaneous exercise of apprentices with the help of specialized programs to acquire theoretical and practical knowledge under the supervision of the teacher, who has the time to help students with slower rhythms and to stimulate the most capable in more advanced tasks (Dorrego, 2011).

For researchers such as Laborí, Echeverría, and Oleagordia (2011), the programmed instruction is the implementation strategy whose purpose is to provoke systematic stimuli and immediate reinforcements. It is oriented in relative problems whose thematic views provoke the exercise. In this case, in the computer would be guidelines, theoretical explanations that establishes a relationship between the student with the teacher or other sources consultations. The results are given through interaction, by recording the data generated by the student in his task and being able to use it as a parameter in the learning process given the didactic and written programs when using the educational interactive resources, the learner learns by the active manipulation of didactic material.

According to the author Fry (1965) quoted in Dorrego (2011), programmed instruction is a self-taught technique whose characteristics are the active participation of the student; decomposition of matter into smaller pieces; immediate verification of each response; control of learning speed; the slides should be with short sentences and paragraphs, which require a response from the student.

In relation to the above, the student must answer a question that can be dichotomous, multiple choice or complete a sentence; their full understanding of the tables; in any case, you need an immediate stimulus

to understand if the answer is correct or not. It is pointed out, that to consolidate what learned the class must be reinforced with many incentives, what in the academic plane implies that the didactic units are ordered carefully, to habituate and to conduct the learnings towards the desired ends. In turn, programs should have specific purposes for assessing their performance with greater care and precision; program reviews are based on student responses; the student decides the speed to do his job.

Among some strategies employed according to Camacho and Pérez (2018), are: performing practical exercises that include writing words to complete a sentence; writing a numerical answer between several options of a mathematical problem; selecting a word from several response options; identifying an item that corresponds to a graph; performing operations with psychomotor function; verifying and correcting according to the results established in a problem; establishing sequences of information based on teacher-oriented guidelines, these will help to modify the form of attention to become a co-participant and self-manager of its own learning and consequently leads it to an increasingly complete domain of the subject.

Garcia (2019), who made a synthesis about distance education, concludes that this was initiated through correspondence education, being the instrument the printing press at the end of the 19th century, materialized in instructional written brochures, Written texts, texts in manuscripts, which traveled by mail to reach their recipient, then went on to a second stage called multimedia in the late sixties, using TV, radio, telephone, are the main means to develop the programmed instruction. Finally, telematics emerged in the eighties, where computing, the virtual campus, stations, the websites used as virtual, network-based media for the development of programmed instruction burst forth.

For Camacho and Pérez (2017) The use of information and communication technologies in remote mathematical instruction has become a valuable tool that enables the teacher to best reach the student to make it an emotionally fun class, entertaining, motivating in the construction of a new knowledge and in a meaningful learning.

With these new technologies applied to education arises a new concept of remote education that for Heedy, (2008) in Lopez (2020), the interactivity of the main educational actors is easily given in a synchronous and asynchronous way at the same time, overcoming the other forms of education at distances listed above, by operating in real time between Students and the Teacher through an equipped platform that has audio, camera, immediate recording and allows socialization, feedback from the concepts studied.

Although the Remote Programmed Instruction (IPR) has become widespread, it reaches the population in an unequal way by a set of factors, pointed out by López (2020), among the most important are: public investment has been slow in the sector of technological infrastructure, especially in times of pandemic budgets are increasingly decimated especially in the Latin American context; educational coverage and quality is very uneven in times of pandemic, not all have an appropriate cell phone or computer or sufficient and permanent connectivity; Curricular prioritization should be done, so as not to cram students with too many topics; In this context, planning is fundamental in the teaching and learning process, especially in the context of the prevailing social inequalities in these Latin countries; Finally, this author

points out, educating under the uncertainty that the virus has caused by not knowing for sure when the return to the classroom will be.

In this sense we can define the Remote Programmed Instruction (IPR), consists of a meeting between students and the teacher, through a schedule previously established in a synchronous manner through platforms in which there is an exhibition on the thematic axes their respective socialization, feedback and argumentation of participants in the act of teaching and learning.

Learning Strategies based on Remote Programmed Instruction

To achieve meaningful learning through IPR, the teacher must offer in times of pandemic, the active participation of the student in synchronous moments or encounters, offering the didactic material in a simple way, understandable in that he can exert control at that instant or asynchronously when he is alone and can determine the speed of learning.

In relation to the above, learning strategies based on the IPR are required, for the full understanding of the thematic axes addressed in synchronous encounters and consolidate what learned in class through communicative skills in public, teamwork or collaboration, strengthen students' relationships with the teacher, and the ongoing motivation to encourage the student to determine the speed to do their work and therefore their learning.

Communication skills

Marimontes, A. and others (2019) explain that, to develop communicative skills, you must cause activities that involve public exhibitions, using digital media at your fingertips that allows you to manipulate materials when describing a slide, and corporeal diction, voice emphasis and rapidity, information management and interaction with dialogue are put into practice. Carry out communication strategies such as videoconferencing, chats, telematics, with appropriate language and clear writing, good spelling, oral expression, and appropriate language. The search for appropriate tutorials that contribute to the development of communication skills. Encourage the group to participate in virtual and face-to-face forums, involve them in conferences, presentations, forums, round tables, panels of experts, etc.

According to Velasco, M. (2018), communicative skills involve talking, perceiving, studying and writing that must be developed from interaction and pedagogical strategies that allow individuals to correctly use language, in both oral and written communication, as well as being able to interpret and understand in different contexts.

Within this communicative argument, hearing and analyzing, becomes a basic dimension for the understanding of mathematical thinking since it is required to develop thinking skills such as curiosity, short-, medium- and long-term retentive in the domain of the subject raised within a mathematical context

It is also important to take into account the communicative skills within the IPR, transmission skills by writing a mathematical problem and speaking in public by exposing short problems in an appropriate

language using problem solving, modeling, argumentation as graphical representation tools, slides, to develop mathematical thinking skills and strengthen cognitive techniques and varied understanding.

Interaction between Student and Teacher

It is important, according to Quiroz, S (2010), to seek out the mechanisms to avoid the isolation of students, either by promoting informal or formal interaction between them, collaboration, the rapprochement between students with synchronous and asynchronous activities, generating meaningful learning and understanding of the problem posed by linking as many as possible in each remote programmed instructions.

According to Marimontes, A. and others (2019), the interaction between the student and the teacher to facilitate learning in a remote environment, this, in addition to facilitating its location and timely advice and resolving doubts in time and form, must be in an environment of trust, Tolerance and empathy between both, about the problem posed that may arise in virtual activities.

In remote programmed instruction, the student, according to Rizo, M (2020), must play a role towards strengthening self-discipline, enhancing the capacity to distribute their time, allowing freedom and flexibility to take advantage of ICT-mediated learning, towards the achievement of their own goals. Self-discipline is defined Kohn, A. (2008) "as the control of one's own willpower to accomplish things that are generally seen as desirable", for Rizo, which requires for the management of learning, a permanent dedication in the proposed tasks, based on the definition of objectives, their execution, monitoring and control which, accompanied by decision, motivation and perseverance, lead to the achievement of its goals.

Self-discipline can help to promote self-learning which, according to Rúgeles, P. et al. (2015), is defined as the student's ability to learn autonomously, actively and participatory, acquiring knowledge and skills and promoting their own values, which results in the self-training of the subject. What allows according to Rizo, M (2020), to demand itself, to manage the distribution of times, the location of spaces, the sources of consultation among which can be mentioned specialized virtual databases for the resolution of problems posed.

The interaction skills between the student and the teacher should lead to the reflective, and critical dimensions and, at the same time, ethics, where reflective thinking according to Contreras, P. and others (2015), defines it as the ability to reason, analyze and argue facts or actions that facilitate the integral development of the student and the generation of knowledge. According to Rizo, M. (2020), the critical and reflective analysis seeks to make education a more humanized process from the point of view of the demand of the actors of the educational process (student, facilitator) as thinking subjects, actors, creators and builders of individual and social knowledge.

Learning strategies based on the use of the Tutorial

The Tutorial according to Camacho (2018), is a computer assisted through a program that acts as an instructor imparting information to a student, with some computer-specific limitations that can be

developed by a master, tutorials are more dynamic when assisted or the database is implemented in the form of hypertext.

According to Colorado and Edel (2011) in Camacho (2018), the tutorial is very practical and specific for teaching a platform, software, program package, system, among others; gives brief and not difficult explanations in the training process either to solve a problem or need. It is a didactic tool that promotes learning in students, motivation and interest to learn autonomously, stimulates the development of certain intellectual skills, especially reasoning, creativity, problem solving and the ability to learn by manipulating materials related to probability, frequency representation and probability distributions.

The tutorial according to Camacho (2018), is a tool that is usually used through computer means, that using an instruction in an orderly way can teach the fundamental in the resolution of problems, with the help of technology. Students, use them to understand their different subjects, especially in mathematics, in the explanation of drawing a graph, frequency table, a probability distribution, classic games or the proportion of randomness, in which they acquire the discipline of following this type of instruction, the complexity of which is increasing, thus improving knowledge and learning independently and autonomously.

For the purposes of this research it is a learning strategy to be taken into account in the definition of indicators to measure the effect of the use of Remote Programmed Instruction for the development of mathematical competences in students of the average district of Barranquilla Colombia.

Teamwork

Learning strategies based on the use of the Tutorial, for teamwork when promoting according to Becerra, J. and others (2002)reflection in students on the importance of the value of responsibility for the commitment assumed in each of the individual and group goals, respect for the work of others and the confidence that must be generated that everyone will carry out the task entrusted to them and that it is understood that only with the equal effort of all will it be possible to make progress in resolving the problems raised.

Miramontes, M. (2020), believes that decisions that are relevant to all members of the group should be put to the vote. Be respectful of ideas that differ from one's own on the part of students. Comply with the agreements established before the group. Open a forum for reflection on the values that foster relations of intergroup harmony and teachers share strategies and visualize the problems with the students, this will be an example of collaboration for the participants.

An important aspect to consider in teamwork is collaborative learning that is associated with positive interdependence; and according to Collazos C. and Mendoza, J. (2006), Interdependence is the mechanism that achieves and encourages collaboration within the working groups. Students have a reason to work together. The activities of the groups are collaborative when they structure the positive interdependence between their members. Readiness is vital for successful teams, whether in math

learning, business or academic environments. Positive interdependence is the key attribute within a collaborative environment.

The tutorial can be a useful tool to strengthen teamwork by being a self-learning remote learning tool by breaking the isolation between peers and as expressed by Contreras, R, and others (2015), lets you see the individual qualities that are shared between peers and facilitators through tools such as, tutorial, forum, email, chat rooms, Virtual Learning images, chat and cloud storage. It is an enabler of the true exchange of knowledge, enriched with the experiences of the other, to strengthen individual learning and the development of communication skills

The Motivation

The use of the tutorial as a strategy of remote self-learning, can be a motivating factor, to lift the mood, the interest to continue in a self-taught way, by using this tool especially if the resolution is going well, increases self-esteem and alertness to move in the right direction.

In this sense Miramontes M. (2020) expresses that positive feedback should be made, correcting errors in the problems posed, assuming that this strengthens the different ways of thinking, interpreting and working information, by overcoming the difficulties encountered and sharing them with their peers either synchronously or asynchronously and achieving better cognitive performance.

Methodological Aspects.

In addressing research on remote programmed instruction and the tutorial as strategies in the learning process for the development of mathematical competences in 11th grade students, the type and design of the research was taken into account; the population; data collection techniques and tools; their validity, their reliability; according to the theoretical framework, the strategies and dimensions proposed.

According to Hurtado (2010), the production of knowledge takes place through the observation of reality and by investigating the relationship between phenomena; by processing the information according to the investigated and explained event, being oriented by the positivist paradigm. In this sense, Hernández and others (2014), the epistemic approach generates scientific knowledge, coming from empirical-inductive observation when constructed from quantitative data and measurements that sometimes validate and apply inductive-based theories.

According to Chávez (2007), the quantitative positivist paradigm, takes data as the concrete expression of reality and objectivity is the only way to reach knowledge, its purpose is to explain, predict, control phenomena, the validity criteria are reliability, objectivity, experimentation, statistics, the most widely

used instruments are questionnaires, tests and objective tests and, finally, their aim is to manifest reality without modifying it.

The research is descriptive, and according to Hernández, and others (2014), it is possible to determine relationships between variables of events that will occur in the future, without explaining the causes. In this order Arias (2012, p.24-28) states that "descriptive research consists in the characterization of a fact, phenomenon, individual or group, in order to establish its structure or behavior".

The proposed research is descriptive in its intention to measure or collect information independently or jointly to submit it to a comprehensive study in order to achieve the proposed objectives. At the same time, the research design is of a non-experimental, transectional or cross-sectional and field type. For Hernandez, Fernandez and Baptista (2014), it is not experimental because it is done without the manipulation of variables and phenomena are observed in their natural environment and then analyzed.

According to the previous authors, it is transversal, by collecting data in a single moment and in a single time; by describing each variable and analyzing incidence and interrelationship at a given time, collecting data directly at a single point in the investigation.

It corresponds to a field design, when collecting the data just in the place where the events associated with the problem occur, in this case the data were taken first hand, from the subjects investigated so it was not necessary to consider other school contexts; In order to make the research viable, the 11th grade students were contacted remotely.

As for the population of the study, we have to take all the students of eleventh grade of IED San Gabriel, located in the south east of the district Barranquilla, capital of the Department of the Atlantic, in other words, it was considered all the population of students belonging to that grade that in total for this year 2021 counts 142 participants.

Once the reliability of the instrument was assessed, a pilot sample was applied to this target population. Tabulating the data gave a magnitude of $\alpha = 0.96$, considered as a high reliability according to the scale proposed by Ruiz (2004); that is, the instrument covered the basic requirements to be applied, achieving the internal consistency of the items according to the study variables.

After collecting the data were encoded through an array or "database", elaborated in Excel, compatible with SPSS software version 25 or the Statgraphics Centurion, which with the necessary arrangements, obtained quantitative results of descriptive and inferential type, verificables con las teorías, objetivos planteados y variables de estudio. , verifiable with theories, stated objectives and study variables. The

empirical results of this research were analyzed by inferential statistics; one-way ANOVA and Student's T-Test. Taking into account the standards designed in the scale in Table 1.

Table 1

Scale of categories for Students

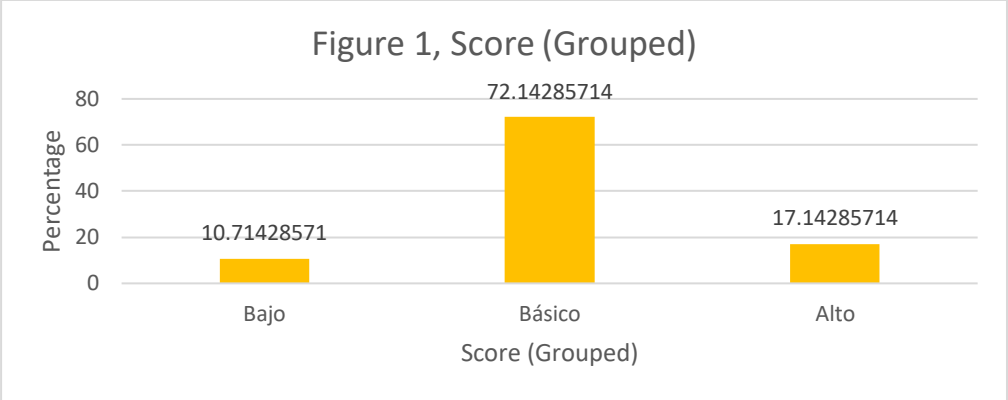
Interval	**Categories of analysis**
4.21 < 5.00	Very High
3.41 < 4.20	High
2.61 < 3.40	Fairly High
1.81 < 2.60	Low
1.00 < 1.80	Very Low

Source: Authors' own creation (2021)

Statistical Results

This research verifies the objectives set by taking information that resulted from a Likert-type questionnaire, with twenty-four items, applied to the 140 students of eleventh grade, class 2020 of the

IED San Gabriel, located in the South Eastern Zone in the city of Barranquilla-Colombia, whose results are grouped in frequency tables for some cases and graphs for others. See Figure 1.



Source: Authors' own creation (2021)

Figure 1, details the scores obtained to the students of the IED SAN GABRIEL, according to the levels of acceptance or understanding of the items raised in the questionnaire of questions type Likert, the 10.71% with low score, 72.14% were located in the basic component and 17.14% with high score.

The results were subjected to the analysis of descriptive and inferential statistics especially by the multivariate statistical method of simplification or dimension reduction, through the mechanism of main components, and according to Cronbach's reliability, its items have a value close to unity, which indicates that our data have an excellent suitability to a factor analysis model and can be studied for their internal coherence is very high close to 1. See table 2.

Table 2, Reliability statistics

Cronbach's Alpha	N of elements
,842	24

Source: Authors' own creation 2021

As for Bartlett's contrast, with an alpha 0.001, it tells us that the null hypothesis is rejected, i.e., it is not significant of initial uncorrelated variables, what would make sense to apply for this study of Remote Programmed Instruction and the tutorial as strategies in the learning process for the development of mathematical competencies in eleventh grade students, factor analysis.

The mechanism of main components to obtain a smaller number of items or significant variables that can explain the phenomenon under study is performed by the linear combination of the original

primitives or items, the interpretation of which will allow a more reliable and simplified analysis of the problem raised.

The main component, according to Pérez, C. (2016), as well as the remaining components that result, or are greater or at most equal to the unit, it is expressed as the linear combination of the original variables:

$$\boldsymbol{Z_{1i} = u_{11}X_{1i} + u_{12}X_{2i} + \cdots + u_{1p}X_{pi}}$$

In the same way, the variance of each component is equal to the eigenvalue of the matrix V to which it is associated, this variability will be:

$$\sum_{h=1}^{p} \boldsymbol{V}(\boldsymbol{X_h}) = \boldsymbol{traza}(\boldsymbol{V})$$

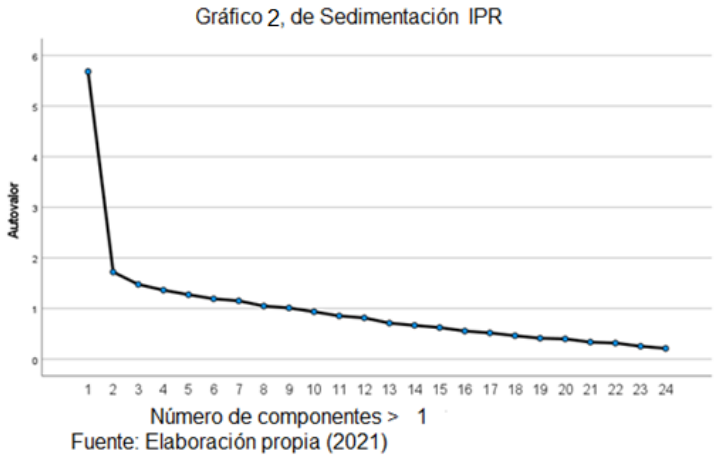
The established procedure, Pérez, C. (2016), to specify the number of principal components is carried out by means of the criterion whose characteristic root (λ_h) exceeds the mean of the characteristic roots. This is:

$$\lambda_h > \bar{\lambda} = \frac{\sum_{j=1}^{p} \lambda_h}{p}$$

In conclusion, those components are retained which:

$$\lambda_h > 1$$

According to the above, when running the results of the variables surveyed in the eleventh grade students of the IED San Gabriel, the graph contrast 2, of sedimentation, the following eigenvalues were obtained that met the algebraic expression of $\lambda_h > 1$.



Fuente: Elaboración propia (2021)

Communalities are worth 1 with their respective extraction coefficients, essential for analyzing the variables in Remote Programmed Instruction (IPR), the main component method underlying the IBM program known as SPSS version 31. See table 2.

Tabla2, Comunalidades de IPR		
Ítems	Inicial	Extracción
Participación activa	1,000	,673
Secuencial y ordenad	1,000	,666
Comprensión y consolidación	1,000	,671
Mantener la atención	1,000	,608
Exposición en público	1,000	,696
Utilizar diapositivas	1,000	,791
Mejorando la escucha	1,000	,749
Participación sicrónica	1,000	,645
Temas escenciales	1,000	,797
Revisión del programa	1,000	,575
Autodisciplina autoaprendizaje	1,000	,663
Interacción reflexiva con los pares	1,000	,596
Optimiza tu aprendizaje	1,000	,607
Tutorial como herramienta	1,000	,600
Resuelve prpoblemas matemáticos	1,000	,587
Guía en físico	1,000	,574
Trabajar en equipo me hace proactiv	1,000	,740
Someter a votación las decisiones	1,000	,771
colaboración del grupo	1,000	,658
Mezcalar diferentes herramienta	1,000	,697
Motivación hacia el autoaprendizaje	1,000	,615
Actividad para levantar el ánimo	1,000	,730
Retroalimentación en positivo	1,000	,671
Compartir las dificultades encontrad	1,000	,543
Método de extracción: análisis de componentes principales.		
Fuente: Elaboración propia (2021)		

Table 3, of total variance, explained in the Remote Programmed Instruction and the tutorial as a learning strategy, shows that the first nine components with a synopsis of 66,34% of the total variability of the phenomenon studied, obtaining synthetic variables or combinations of the originals.

Tabla 3, Varianza total explicada en IPR									
Componente		**Autovalores iniciales**		**s de cargas al cuadrado de la extra**			**Sumas de cargas al cuadrado de**		
	Total	% de var	% acumu	Total	% de varia	% acumulado	Total	% de varia	% acumulac
1	**5,682**	**23,675**	**23,675**	**5,682**	**23,675**	**23,675**	**4,231**	**17,628**	**17,628**
2	**1,721**	**7,173**	**30,848**	**1,721**	**7,173**	**30,848**	**2,208**	**9,202**	**26,830**
3	**1,476**	**6,152**	**37,000**	**1,476**	**6,152**	**37,000**	**1,792**	**7,466**	**34,297**
4	**1,364**	**5,682**	**42,682**	**1,364**	**5,682**	**42,682**	**1,376**	**5,731**	**40,028**
5	**1,273**	**5,305**	**47,987**	**1,273**	**5,305**	**47,987**	**1,337**	**5,570**	**45,598**
6	**1,192**	**4,967**	**52,954**	**1,192**	**4,967**	**52,954**	**1,260**	**5,251**	**50,849**
7	**1,152**	**4,799**	**57,753**	**1,152**	**4,799**	**57,753**	**1,245**	**5,186**	**56,035**
8	**1,049**	**4,372**	**62,125**	**1,049**	**4,372**	**62,125**	**1,241**	**5,171**	**61,206**
9	**1,012**	**4,215**	**66,341**	**1,012**	**4,215**	**66,341**	**1,232**	**5,135**	**66,341**
10	,936	3,901	70,242						
11	,854	3,559	73,800						
12	,815	3,397	77,198						
13	,712	2,966	80,163						
14	,667	2,779	82,943						
15	,624	2,600	85,542						
16	,555	2,314	87,857						
17	,518	2,159	90,016						
18	,463	1,930	91,945						
19	,413	1,722	93,667						
20	,400	1,666	95,333						
21	,336	1,401	96,734						
22	,318	1,323	98,057						
23	,254	1,060	99,118						
24	,212	,882	100,000						
Método de extracción: análisis de componentes principales.									
Fuente: Elaboración propia (2021)									

The procedure that is woven in this research consist in searching, rotating, to find specific or related commonalities that generate a new underlying information not revealed in the original variables. The

factorial model, allows to make contrasts to go looking for the relevance and to go looking for to evaluate the results of the programmed remote instruction.

In Table 4, the component matrix is presented in the IPR, it is observed that the first component is positively correlated with fourteen items, shown with the red color, the other variables in the subsequent components are correlated in the form of a pair.

Tabla 4, Matriz de componente[a] en la IPR

	Componente								
	1	2	3	4	5	6	7	8	9
Mejorando la escucha	**0.773**	-0.114		0.163		-0.224	-0.190		-0.130
Utilizar diapositivas	**0.757**	-0.373					-0.196		-0.145
Exposición en público	**0.717**	-0.236		0.320					
Resuelve prpoblemas matemáticos	**0.707**	-0.227						-0.104	
Participación activa	**0.635**	-0.242		0.235		-0.310	0.149		0.154
Tutorial como herramienta	**0.597**		0.256					-0.209	0.350
colaboración del grupo	**0.572**	0.279	-0.291	-0.233	-0.181	-0.275			
Mantener la atención	**0.555**	0.315	-0.131	-0.158	0.129	-0.116		0.268	0.233
Optimiza tu aprendizaje	**0.531**	0.131	-0.202	-0.222		0.222		-0.357	0.191
Retroalimentación en positivo	**0.500**	0.296	0.249	-0.158	-0.345		-0.144		0.323
Comprensión y consolidación	**0.484**	0.364	-0.339				0.394	0.115	-0.102
Interacción reflexiva con los pares	**0.480**	0.192	0.274	-0.312		0.151		0.357	
Revisión del programa	**0.478**	0.174		0.247	0.159	0.385	-0.128	0.219	0.128
Guía en físico	**0.431**	0.270	0.212	-0.236	0.142	0.331	0.242		-0.129
Mezcalar diferentes herramienta	0.360	**0.401**	-0.172	0.387		-0.233	0.196		-0.361
Compartir las dificultades encontradas	0.242	**-0.398**	-0.183	-0.213	-0.172	0.278		0.362	
Participación sicrónica	0.265	-0.270	**0.577**	-0.145				0.149	-0.333
Someter a votación las decisiones	-0.291	0.133	0.202	**0.591**	-0.100	0.249	0.270		0.362
Autodisciplina autoaprendizaje	0.280	0.158	0.381	**0.442**	0.146		-0.386	0.194	-0.101
Actividad para levantar el ánimo	0.149	-0.392	-0.264		**0.585**	0.315	0.181		
Secuencial y ordenad	0.236	-0.192	-0.234	0.103	**-0.566**	0.392			-0.145
Motivación hacia el autoaprendizaje	0.114		-0.263		0.447	-0.112	**-0.511**		0.208
Trabajar en equipo me hace proactivo	0.251	-0.409	0.278		0.143	-0.378	**0.448**		0.236
Temas escenciales	0.343	0.233	0.310		0.298			**-0.602**	-0.246

Método de extracción: análisis de componentes principales.

a. 9 componentes extraídos.

Fuente: Elaboración propia (2021)

With the application of the factorial extraction method known as varimax rotation, Perez, C (2016), it is obtained by maximizing the sum of the variances of the load, factorials squared within each factor.

Table 5 shows the result of the application of the factorial analysis of SPSS, precisely identical to the new grouping or underlying components, or factors that explain most of the explained variance distributed across the nine components of the manifest or regrouped variables.

The component matrix is presented in the IPR, it is observed that the first component is positively correlated with six items, shown in red; Public presentation, Use slides, solves mathematical problems,

active participation, improving listening, and the tutorial as a tool. The correlation is positive because these items are very close to the abscissa axis.

Tabla 5, Matriz de componente rotado[a] en la IPR

Ítems	Componente								
	1	2	3	4	5	6	7	8	9
Exposición en público	0.773		0.212			0.182			
Utilizar diapositivas	0.773	0.231		-0.102	0.318	0.101			
Resuelve prpoblemas matemáticos	0.721	0.207	0.101						
Participación activa	0.721		0.264						0.266
Mejorando la escucha	0.714		0.293		0.258	0.247			
Tutorial como herramienta	0.600	0.267	-0.111	0.276	-0.146			0.205	0.106
Interacción reflexiva con los pares	0.127	0.704		0.140	0.179	0.146			
Guía en físico		0.687	0.164				-0.159	0.194	
Revisión del programa	0.311	0.484	0.130		-0.264	0.253	0.212		-0.200
Mantener la atención	0.238	0.468	0.367	0.189			0.335		0.185
Mezcalar diferentes herramienta	0.139		0.775			0.229		0.126	
Comprensión y consolidación	0.185	0.321	0.699			-0.189			
colaboración del grupo	0.324	0.173	0.468	0.341	0.360	-0.191	0.142		
Actividad para levantar el ánimo	0.222	0.108		-0.781		-0.122	0.185		
Retroalimentación en positivo	0.346	0.372		0.626					
Someter a votación las decisiones	-0.128				-0.847	0.105	-0.132		
Autodisciplina autoaprendizaje	0.201	0.154			-0.127	0.738	0.100	0.125	
Optimiza tu aprendizaje	0.409	0.313	0.100			-0.428	0.185	0.292	-0.160
Motivación hacia el autoaprendizaje			-0.100	-0.121	0.226	0.134	0.717		
Participación sicrónica	0.201	0.271	-0.182		0.272	0.307	-0.513		0.256
Temas escenciales	0.184	0.206			0.112		-0.112	0.829	
Compartir las dificultades encontradas	0.253	0.272		-0.210	0.165	-0.165	-0.148	-0.511	-0.117
Trabajar en equipo me hace proactivo	0.337					-0.108	-0.191		0.747
Secuencial y ordenad	0.374					-0.148	-0.269	-0.233	-0.611

Método de extracción: análisis de componentes principales.

a. La rotación ha convergido en 21 iteraciones.

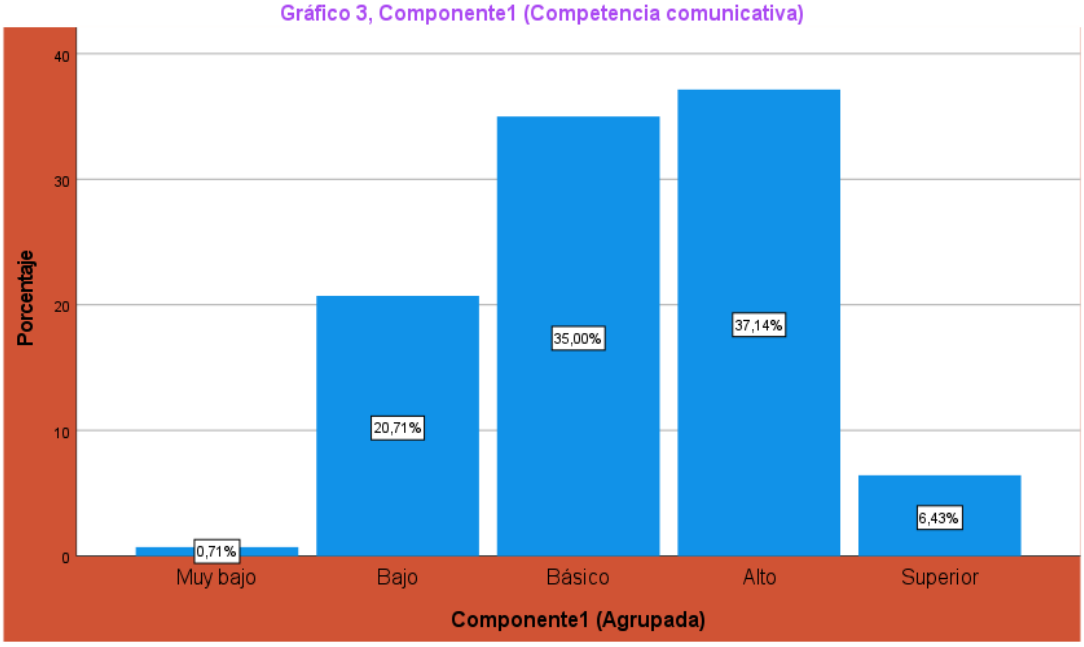
Fuente: Elaboración propia (2021)

This first underlying component could be recontextualized as communicative competence of mathematics, coinciding with the approach outlined by Marimontes, A. and others (2019), who explain that, in order to develop communicative skills, activities involving communicative skills must be

promoted, such as public exposure, using digital media at their disposal, active participation, constant improvement of listening, among others.

COMPUTE Componente1=EP + UD + RPM + PA + ME+TCH.

Gráfico 3, Componente1 (Competencia comunicativa)



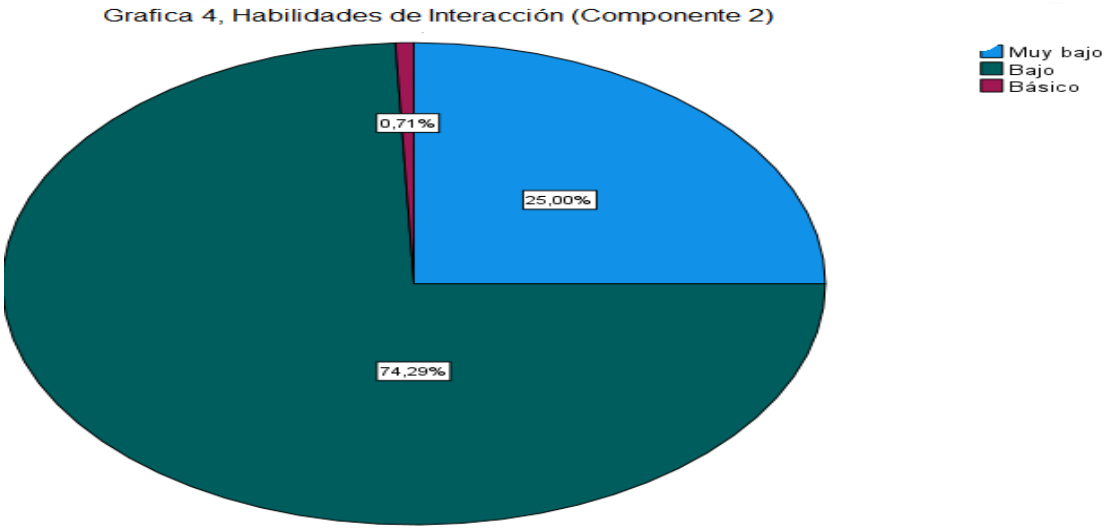
Source: Authors' own creation (2021)

When comparing Figure 2, of factor or component 1, the 72.14% is at the basic level, while the same factor expressed in Figure 3, shows that in the same component, the basic level represents only 35%, the high level represents 37,14% and shows a higher level that was not in the previous compact; in this graph, represents 6.43%. The new variable called Communicative Competence in its new grouping of component 1, expresses in the best way the multivariate analysis in the IPR and the tutorial as strategies in the learning process for the development of mathematical competences.

The second component, is positively correlated, can be deduced the following relationship between component and variables; reflective peer interaction, physical guides, program review, maintenance of

attention. The association of these variables would lead to the development of interaction skills among students that lead to reflective thinking of mathematics.

Componente2=IRP + GF + RP + MA



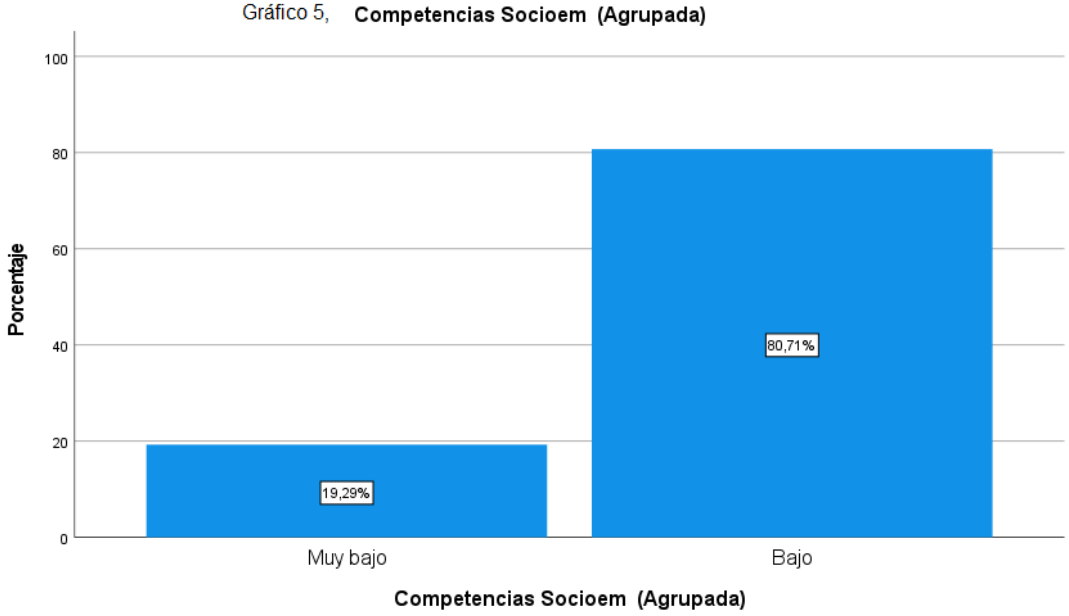
Graph 4, component 2 regrouped in the variable of interest, Interaction skills, 25.0% with a very low level and 74.29% is at a low level, 0.715% represents a basic level.

The grouping of the variables of the fourth component would be called Socioemotional competences, correlated in a positive way with the variables, Activity to lift the spirits (CAA) and Positive Feedback (RAP), argued by Marimontes, M. (2020), positive feedback should be made by correcting the

mathematical problems posed, assuming that this strengthens the mood and different ways of thinking, interpreting and working information.

Componente4=CAA + RAP.

Gráfico 5, **Competencias Socioem (Agrupada)**



Source: Authors' own creation (2021)

The set of items that are associated in component 4, through the linear combination, can be observed in figure 5, pointing to a very low level equivalent to 19.29% and the other observation with the 80.71% at the low level. This factor would be explaining that students express emotional levels contrary to what Marimontes et al. (2020) raised, in the sense that positive feedback should be made when correcting the mathematical problems posed, assuming that this strengthens the mood and different ways of thinking, interpreting and working information.

CONCLUSIONS

The objective of this research was to determine the importance in the use of remote programmed instruction and the tutorial as a strategy in the learning process for the development of mathematical competences in eleventh grade students in the IED San Gabriel of the District of Barranquilla that stands out in the high category, when it comes to using technological tools using the IPR and the tutorial on solving mathematical problems that according to the Cronbach's reliability, its items have a

value close to unity, which indicates that our data have an excellent adaptation to a factor analysis model and can be studied, because their internal coherence is very high, close to 1.

Bartlett's contrast, with an alpha 0.001, tells us that the null hypothesis is rejected, i.e., it is not significant of initial uncorrelated variables, so it would make sense to apply the goal set for this study of Remote Programmed Instruction and the tutorial as strategies in the learning process for the development of mathematical skills, coinciding with what stated by Pérez C. (2016), to apply factor analysis.

This gave way to apply the mechanism of main components to obtain a smaller number of items or significant variables that explain the phenomenon of study through the linear combination of the primitives or original items expressed as follows:

$$\boldsymbol{Z_{1i} = u_{11}X_{1i} + \ u_{12}X_{2i} + \cdots + u_{1p}X_{pi}}$$

In the same way, the variance of each component is equal to the eigenvalue of the matrix V to which it is associated, this variability will be:

$$\sum_{h=1}^{p} \boldsymbol{V\,(X_h) = traza(V)}$$

When running the SPSS, with the variables established and its original items, the scores obtained from the students of the IED SAN GABRIEL, according to the levels of acceptance or understanding of the items raised in the Questionnaire of questions type Likert were, the 10.71% with low score, 72.14% were located in the basic component and 17.14% with high score, coinciding with what Camacho et al., (2018) raised about the role and opportunities that ICT provide to humanity, especially to education for the formation of basic secondary education, middle and college.

The total variance explained in the IPR and the tutorial as a learning strategy, shows that the first nine components with a synopsis of 66.34% of the total variability of the phenomenon studied, obtaining synthetic variables or combinations of the originals, leading to new grouping or underlying components, or factors explaining most of the explained variance distributed across the nine components of the manifest or regrouped variables.

The first component is positively correlated with six items: Public presentation(PE), Using slides(UD), Solving Mathematical Problems(RPM), Active Participation(PA), Improving Listening(ME), and

Tutorial as a Tool(TCH). The correlation is positive because these items are very close to the abscissa axis.

COMPUTE Componente1=EP + UD + RPM + PA + ME+TCH

This first underlying component could be recontextualized as communicative competence of mathematics, coinciding with the approach outlined by Marimontes, A. and others (2019), who explain that, to develop communicative skills, activities involving communicative skills, such as public exposure, using the digital media at their disposal, active participation, the constant improvement of listening, among others, should be caused.

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This is confirmed by the factor or component 1 underlying the model explained, at a basic level of 35%, the high level represents 37.14% and shows a higher level that was not observed in the original variables, representing 6.43%, as a new variable called Communicative Competence in its new regrouping.

The second component was positively correlated with reflexive peer interaction (IRP), Physical Guides (GF), program review (RP), maintaining attention (MA). The association of these variables would lead to the development of interaction skills among students leading to a reflective thinking of mathematics.

Componente2=IRP + GF + RP + MA

The behavior of component 2 grouped in the variable of interest, Interaction skills, presents a very low level of 25.0%, 74.29% is at a low level, and 0.715 represents in basic level. Component 3 showed the same behavior.

The grouping of the variables of the fourth component would be called Socioemotional competences, correlated positively with the variables, Activity to lift the spirits (CAA) and Positive Feedback (RAP), argued by Marimontes, M. (2020), that positive feedback; should be made by correcting the mathematical problems posed, assuming that this strengthens the mood and different ways of thinking, interpreting and working with information.

Componente4=CAA + RAP.

However, in the results obtained from the linear combination of this component, can be observed that 19.29% is at a very low level and the other observation with 80.71% at the low level. This factor would explain that, the students express emotional levels contrary to what was raised by Marimontes et

al. (2020), in this sense, positive feedback should be made when correcting the mathematical problems posed, assuming that this strengthens the mood and different ways of thinking, interpreting and working information.

The other components from five to nine did not show significant levels so they were not related in these conclusions.

RECOMMENDATIONS

Greater emphasis should be placed on the development of socio-emotional skills, by the District Educational Institutions as a strategy or variables to raise the spirits and strengthen positive in terms of positive feedback by correcting the mathematical problems posed, assuming that this strengthens the mood and different ways of thinking, interpreting and working information.

It is recommended to establish a curriculum and content in the area of mathematics adapted to learning strategies through remote programmed teaching in time of pandemic and presence.

and is responsible for all the demonstrations that exist in this article, I have no words, no actions that can reflect my deep gratitude and admiration.

To my cousin Hector Acuña, for listening to me and giving me your honest opinion, thank you for being with me and supporting me with your faith in me

I want to thank our families for supporting us throughout the investigation process and every person who directly or indirectly pushed everything forward.

Finally, thanks to all mathematicians from the historical beginning of this science, in the end, every theorem, every number, every conjecture is connected, none of this was possible if it were not for the human effort to describe the universe of numbers throughout history, thank you for a legacy and its gift.

Eduardo J. Acuña. T. "*Superbia custodit nos stantes.*"

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(1) Universidad del Atlántico, Facultad de Ciencias Básicas, Barranquilla, Colombia (e-mail: carloscamacho@mail.uniatlantico.edu.co)
(2) Universidad Privada Dr. Rafael Belloso Chacín, Docente y Miembro de Comité Académico del Doctorado en Ciencias de la Educación, Maracaibo – Venezuela (e-mail: perezsanndro@gmail.com)
(3) *Universidad del Atlántico, Facultad de Ciencias Básicas, Barranquilla, Colombia (e-mail: kennedyhurtado@mail.uniatlantico.edu.co)*

ANNEXES A01
QUIZ FOR: ELEVENTH GRADE STUDENTS
It is important to read all the instructions before answering the quiz:
1. Carefully read all items before selecting them.
2. Follow the established order.
3. Do not leave any items unanswered.
4. Each item is structured by several alternatives. Select a single and mark it according to your opinion.
5. No answer is correct or incorrect. Try to respond truthfully and sincerely, it will depend on the relevance of the information.
6. If there are doubts when answering the instrument, consult the pollster.

GENERAL OBJECTIVE: Identify learning strategies based on remote programmed instruction (IPR) for the development of mathematical skills in middle school students in the Barranquilla District – Colombia

	ITEM	S	CS	AV	CN	N
Variable: To identify learning strategies based on remote programmed instruction.						
Dimension: Teaching learning strategies in remote programmed instruction.						
Indicator: Remote Programmed Instruction (IPR)						
You as a student consider that:						
1	In the IPR you have had an active participation in synchronous encounters in solving mathematical problems					
2	You have improved learning in the subject of mathematics by explaining it sequentially and ordered remotely					
3	You understand the thematic axes raised in the IPR immediately and consolidate what you have learned in solving the proposed math problems					
4	Responses to synchronous questions help me keep my focus on class development					
	Indicator: Communication skills					
	You as a student consider that:					
5	You believe that learning through the IPR strengthens your public exposure to mathematical thinking					
6	You believe that through the IPR you have improved the use of slides for your exposure to my peers in math class					
7	With the IPR you have improved listening and your math skills					
8	With the IPR you have improved your active participation in math class					
	Indicator: Student-Teacher Interaction					
	You as a student consider that:					
9	You think that in the midst of the pandemic the essential topics of the subject in mathematics have been covered.					
10	You think the math program review has improved learning in the midst of the pandemic					
11	You believe that through IPR you have improved self-discipline and encouraged self-learning in the midst of the pandemic					
12	You believe that IPR has improved reflexive interaction with your peers and the Teacher in the midst of this pandemic					
Variable: To identify learning strategies based on the use of the Tutorial						
Indicator: Tutorial						
You as a student consider that						
13	With the use of the tutorial as a learning tool, optimize your learning of the math subject					
14	Deepen the content of math if you use tutorials as a learning tool					
15	Solve math problems using tutorials as a self-learning tool					
16	Use online tutorial alone or in the company of an adult or peers in problem solving					
	Indicator: Working in Partnership					
	You as a student consider that...					
17	Working as a team online makes you more proactive in understanding for mathematical problem solving					
18	You must put to the vote the decisions that pertain to all members of the group in times of pandemic in solving mathematical problems.					
19	Have you ever used the tutorial and get collaboration within the working group in troubleshooting your environment					
20	Mixing the use of the tutorial with different information dissemination technologies to achieve a good result of mathematical problems					
	Indicator: The motivation					
	You as a student consider that:...					
21	With the use of the tutorial you motivate yourself towards self-learning to solve problems quickly					
22	You've shared some activity to cheer your fellow mathematicians up by solving mathematical problems					
23	Make positive feedback in the IPR with the help of the tutorial					
24	Share the difficulties encountered with your peers either synchronous or asynchronous and get cognitive performance in mathematics.					

Source: Authors' own creation 2021

S: Always; CS: Almost always; AV: Sometimes; CN: Almost never; N: Never.

ESTRATEGIA DE APRENDIZAJE BASADA EN LA IPR Y EL USO DEL TUTORIAL 2021 05 31

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	total								prom
1	3	3	3	1	1	4	2	4	3	1	3	1	3	4	3	1	3	3	2	1	3	4	3	4	63	2.5	3	2	2.75	2	4		2.6
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91	4	5	4	2	4	1	1	3	2	3	2	3	1	4	5	2	2	3	2	2	4	3	2	3	67	3.8	2	2.5	3	2	3		2.8
92	4	4	3	1	4	5	4	3	2	2	3	1	3	4	2	2	3	3	2	4	3	3	3	4	72	3	4	2	2.75	3	3		3
93	3	3	2	3	3	1	1	3	3	1	2	3	2	3	5	1	4	3	3	2	4	4	2	3	64	2.8	2	2.25	2.75	3	3		2.7
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96	5	2	2	1	4	5	4	3	2	2	3	3	1	4	3	2	4	3	1	2	3	3	3	3	68	2.5	4	2.5	2.5	3	3		2.8
97	4	3	1	2	4	1	2	3	2	1	3	1	3	3	5	1	4	4	2	3	3	4	2	3	64	2.5	3	1.75	3	3	3		2.7
98	3	4	1	1	2	5	1	3	2	2	3	3	2	3	3	2	4	3	1	2	4	4	2	3	63	2.3	3	2.5	2.5	3	3		2.6
99	3	3	1	2	3	1	1	3	2	3	2	2	1	3	3	1	4	4	1	3	3	3	3	2	57	2.3	2	2.25	2	3	3		2.4
100	4	2	1	1	4	5	4	3	2	2	2	3	2	3	5	2	4	3	1	2	4	4	1	3	67	2	4	2.25	3	3	3		2.8
101	5	3	2	2	4	1	2	3	1	1	3	2	1	3	2	2	4	3	2	3	4	3	3	2	61	3	3	1.75	2	3	3		2.5
102	3	2	2	1	4	5	4	3	1	2	2	1	3	4	5	1	4	3	2	2	3	4	1	3	65	2	4	1.5	3.25	3	3		2.7
103	3	3	3	1	3	1	1	3	2	1	3	2	2	3	1	2	4	4	1	3	2	3	1	2	54	2.5	2	2	2	3	2		2.3
104	3	2	3	2	2	2	3	2	1	2	3	1	2	3	5	3	4	3	3	3	3	3	3	3	64	2.5	2	1.75	3.25	3	3		2.7
105	3	4	1	1	4	5	4	3	1	2	2	2	3	3	5	2	4	3	2	3	4	3	2	3	69	2.3	4	1.75	3.25	3	3		2.9
106	3	1	1	1	2	3	1	3	3	2	3	4	2	3	3	2	4	3	1	1	3	3	2	3	57	1.5	2	3	2.5	2	3		2.4
107	3	2	1	2	3	1	1	3	2	3	2	3	1	3	5	2	4	4	2	2	4	3	2	3	61	2	2	2.5	2.75	3	3		2.5
108	5	3	1	1	4	2	4	3	2	2	3	1	3	4	2	2	5	3	2	1	3	3	3	3	65	2.5	3	2	2.75	3	3		2.7
109	3	3	2	3	3	1	1	3	3	1	2	2	2	3	5	1	4	3	3	2	2	3	2	3	60	2.8	2	2	2.75	3	3		2.5
110	1	3	1	1	2	3	1	2	2	2	3	1	1	4	1	2	3	4	1	2	3	4	1	3	51	1.5	2	2	2	3	3		2.1
111	3	3	3	2	3	1	2	3	2	1	2	2	1	1	5	1	3	3	2	3	2	3	1	2	54	2.8	2	1.75	2	3	2		2.3
112	1	4	2	1	4	2	1	2	2	2	3	1	1	4	1	2	3	4	1	2	3	4	1	4	55	2	2	2	2	3	3		2.3
113	3	3	1	2	1	1	2	1	1	1	2	1	3	2	2	1	3	3	2	1	4	4	2	4	50	2.3	1	1.25	2	2	4		2.1
114	5	3	1	1	4	3	4	3	2	1	3	2	2	4	5	2	4	3	1	2	2	3	2	4	66	2.5	4	2	3.25	3	3		2.8
115	3	4	3	2	3	1	1	3	2	3	2	1	3	4	3	1	4	3	3	3	4	3	3	2	64	3	2	2	2.75	3	3		2.7
116	5	4	4	1	4	2	1	3	2	2	2	3	2	3	5	2	3	3	3	2	3	3	3	3	68	3.5	3	2.25	3	3	3		2.8
117	4	3	2	2	4	1	2	1	1	1	3	1	1	2	2	1	3	4	1	3	2	3	3	2	52	2.8	2	1.5	1.5	3	3		2.2
118	2	3	2	1	2	1	1	1	1	2	2	2	3	3	1	1	3	3	2	2	2	4	1	4	49	2	1	1.75	2	3	3		2
119	3	4	1	1	1	1	2	1	2	1	3	1	1	3	1	2	4	3	1	1	3	4	1	2	47	2.3	1	1.75	1.75	2	3		2
120	4	3	3	1	2	2	1	4	1	2	1	1	2	3	2	1	4	4	1	1	3	4	1	4	55	2.8	2	1.25	2	3	3		2.3
121	3	4	1	1	1	1	1	4	1	2	2	2	1	3	5	2	5	4	2	3	2	3	2	3	58	2.3	2	1.75	2.75	4	3		2.4
122	4	4	1	1	4	5	4	4	2	2	3	1	1	4	5	2	5	3	3	2	3	4	1	4	72	2.5	4	2	3	3	3		3
123	3	3	3	2	3	1	2	3	2	3	2	1	1	3	1	3	4	4	2	3	2	3	1	2	57	2.8	2	2	2	3	2		2.4
124	1	3	2	1	1	2	1	4	2	1	1	1	1	1	1	2	4	3	1	2	3	4	1	4	47	1.8	2	1.25	1.25	3	3		2
125	4	2	3	2	4	5	4	4	1	1	2	1	3	4	5	1	4	3	1	3	3	3	1	3	67	2.8	4	1.25	3.25	3	3		2.8
126	3	3	1	1	2	3	1	4	2	2	3	2	2	1	1	2	4	3	1	2	2	3	2	4	54	2	3	2.25	1.5	3	3		2.3
127	1	1	1	2	1	1	1	4	2	1	2	1	1	4	1	1	4	3	1	1	4	3	3	2	46	1.3	2	1.5	1.75	2	3		1.9
128	3	3	1	1	1	1	1	4	2	2	3	1	2	1	1	2	4	3	1	2	3	3	1	4	50	2	2	2	1.5	3	3		2.1
129	2	3	2	2	1	1	2	3	1	1	1	1	1	2	2	2	4	4	2	1	3	3	1	2	47	2.3	2	1	1.75	3	2		2
130	4	2	2	1	4	5	1	4	2	2	3	1	1	5	5	1	4	3	2	2	4	3	1	4	66	2.3	4	2	3	3	3		2.8
131	1	3	1	1	1	1	1	3	2	1	2	1	2	1	1	2	4	3	1	1	3	3	1	2	42	1.5	2	1.5	1.5	2	2		1.8
132	3	2	1	2	2	2	4	4	2	2	3	1	2	2	2	1	4	4	1	3	3	3	1	4	58	2	3	2	1.75	3	3		2.4
133	4	5	1	1	4	5	3	3	1	2	2	3	3	5	5	2	4	3	2	1	3	3	2	4	71	2.8	4	2	3.75	3	3		3
134	3	2	3	2	1	1	4	3	1	1	3	1	1	2	2	1	4	3	2	3	4	3	1	1	52	2.5	2	1.5	1.5	3	2		2.2
135	3	1	2	1	2	3	1	3	2	2	1	2	2	3	1	2	2	2	1	2	3	3	2	1	47	1.8	2	1.75	2	2	2		2
136	3	2	3	2	1	1	1	3	2	3	3	1	1	2	1	1	4	3	1	1	4	3	1	2	49	2.5	2	2.25	1.25	2	3		2
137	1	3	1	1	1	2	1	3	2	2	2	3	1	1	1	2	2	3	3	1	3	3	3	1	46	1.5	2	2.25	1.25	2	3		1.9
138	3	3	2	2	1	1	2	3	1	1	1	1	1	2	2	2	4	4	2	3	4	3	3	2	53	2.5	2	1	1.75	3	3		2.2
139	3	4	2	1	5	5	4	3	1	2	3	1	1	1	5	1	2	3	2	2	3	3	1	4	62	2.5	4	1.75	2	2	3		2.6
140	4	3	1	1	5	1	4	3	2	1	3	1	2	4	5	2	4	4	1	3	4	3	1	4	66	2.3	3	1.75	3.25	3	3		2.8
																																	0
																										3.4	3	3.16	3.31	3	3		0

INTERPRETACIÓN VALORACIÓN INSTRUMENTO

S: Siempre; CS: Casi siempre; AV: Algunas veces; CN: Casi nunca; N: Nunca.

S= 5 CS = 4 AV = 3 CN = 2 N = 1