

## The online modality in the school performance of 8th grade students in the subject of mathematics

La modalidad en línea en el desempeño escolar de los estudiantes del 8vo año en la asignatura de matemática

A modalidade online no desempenho escolar dos alunos do 8º ano na disciplina de Matemática

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**Abstract:** At present, school performance has been affected by several factors, one of these is the online modality, which has been imposed due to the pandemic of covi-19 in the institutions, without having a previous preparation of teachers and students to face this modality. The objective of this research is to determine the incidence of the online modality in the school performance of 8th grade students in the subject of mathematics at the Francisco Huerta Rendón school in a field study, for the development of a mobile application; scientific methods were applied both theoretical and empirical, by applying as instruments a guide of observation of entry where the problem was detected, in turn surveys and interviews were applied to students, teachers and school principal, it was revealed how satisfied were those involved in this modality given, with a total sample of 121 students, in

addition to the participation of teachers and vice principal of the school already mentioned. The students themselves suggested that they need help such as the proposal put forward in this study to create a mobile application containing the most complex topics in the subject of mathematics for reinforcement and improvement of school performance.

**Keywords:** mobile application, school performance, mathematics, online modality.

**Resumen:** En la actualidad el desempeño escolar ha sido afectado por varios factores, uno de estos es la modalidad en línea, la cual se ha impuesto debido la pandemia del covi-19 en las instituciones, sin tener una preparación previa de docentes y estudiantes para enfrentar esta modalidad. La presente investigación tiene como objetivo determinar la incidencia de la modalidad en línea en el desempeño escolar de los estudiantes 8vo de básica en la asignatura de matemáticas del colegio Francisco Huerta Rendón en un estudio de campo, para el desarrollo de una aplicación móvil; se aplicaron métodos científicos tanto teóricos como empíricos, al aplicar como instrumentos un guía de observación de entrada donde se detectó la problemática, a su vez se aplicaron encuestas y entrevista a estudiantes, docentes y director del colegio, se dio a conocer que tan satisfechos se encontraban los involucrados en esta modalidad dada, con una muestra total de 121 estudiantes, además la participación de docentes y vicerrector del colegio ya mencionado. Sugiriendo los propios alumnos que necesitan de una ayuda como la propuesta planteada en este estudio de crear como tal una aplicación móvil que contengan los temas más complejos en la asignatura de matemáticas para el refuerzo y mejoría del desempeño escolar.

**Palabras clave:** aplicación móvil, desempeño escolar, matemáticas, modalidad en línea.

**Resumo:** A modalidade online no desempenho escolar dos alunos do 8º ano na disciplina de Matemática. O objectivo desta investigação é determinar a incidência da modalidade online no desempenho escolar dos alunos do 8º ano na disciplina de matemática na escola Francisco Huerta Rendón, num estudo de campo, para o desenvolvimento de uma aplicação móvel; Os métodos científicos foram aplicados tanto em teoria como empiricamente, aplicando como instrumentos um guia de observação de entrada onde o problema foi detectado, por sua vez inquéritos e entrevistas foram aplicados a estudantes, professores e director da escola, revelou-se o quão satisfeitos estavam os envolvidos nesta modalidade, com uma amostra total de 121 estudantes, para além da participação de professores e vice-directores da escola já mencionada. Sugerindo aos próprios alunos que precisam de ajuda como a proposta apresentada neste estudo para criar como tal uma aplicação móvel contendo os tópicos mais complexos na disciplina de matemática para o reforço e melhoria do desempenho escolar.

**Palavras-chave:** aplicação móvel, desempenho escolar, matemática, modalidade online.

## INTRODUCTION

One of the biggest challenges that has become evident for teachers, parents and students is how to carry out an adequate and optimal education within the online modality, although this has been practiced for many years, for those involved it is new since they did not see the need to carry out this type of education.

During the realization of one of the extracurricular activities at the height of the pandemic and recently adapting to the online modality at the Francisco Huerta Rendón School, it was seen that there was little understanding of the

classes taught and among the students it was complicated to follow a line according to what was taught, as well as the teaching staff was involved since the attention that the students receive depends on them.

The research is developed to know the inconvenience, which may be occurring in this modality, either on the part of students or teachers or the resources that are being used, which is why through surveys and interviews we reached students, teachers and school authorities to know what they think about the performance that is being developed by all.

Until June 2019, Ecuador was undergoing changes of adaptation due to the implementation of new technologies, which were necessary for a better quality of education, however, these implementations affected academic performance or also called school performance leaving in evidence within the classroom several problematic situations of learning and assimilation of knowledge.

School performance has always been a challenge for teachers, which has become very complicated to get to know the causes of low school performance, whether it is due to external causes such as the family environment or internal causes of the educational unit.

The traditional methodological strategies used by teachers in the classroom cause students to lose interest in their studies in relation to complex subjects, affecting their performance in the classroom, thus reflecting poor academic performance.

At the end of 2019, China announced the appearance of a deadly virus called SARS-COV-2, known as the disease called COVID-19, while by the end of January the WHO declared this virus as a pandemic due to its spread; in Ecuador the first case of COVID-19 was announced at the end of February, in mid-March 2020 the Ministry of Public Health declared a state of emergency and total confinement, because of this virus; One of the most

affected ministries was the Ministry of Education, since it became very complicated to start classes; in a ministerial agreement it was informed that in July of that year classes would be resumed but under the online modality; the educational institutions were not prepared for this type of study, especially the public institutions. The schools and their teachers were not trained in the use of technological resources and virtual platforms in order to initiate this type of hybrid education despite the fact that the use of this type of technology was already being implemented.

This particularity arose in zone 8 once the first online period was concluded, where it detected the shortcomings of this, being the low school performance higher than in previous years, since this online modality was unknown in the city for educational institutions at primary and secondary level, being a challenge for parents, students and teachers, that is, the entire educational system. Having little time to train teachers and students for this new study activity.

Therefore, it is necessary to formulate the problem, resulting in the following question: How does the online modality affect the school performance of 8th grade students in the subject of mathematics at the Francisco Huerta Rendón School during the period 2020-2021?

The main objective of the research is to determine the incidence of the online modality in the school performance of 8th grade students in the subject of mathematics at the Francisco Huerta Rendón school in a field study with scientific methods, for the development of a mobile application.

The specific objectives were the following: to diagnose the online modality in the subject of mathematics through theoretical methods, to evaluate the school performance of 8th grade students in the subject of mathematics at the Francisco Huerta Rendón school through theoretical and empirical

methods, and to develop a mobile application that helps to reinforce knowledge.

School performance is a situation that worries teachers and parents during all times, both parents and teachers would like students to be the best and with an ideal achievement where they achieve the development of creative and innovative capabilities; However, these purposes have been affected by different causes, among these is the lack of motivation in the learning of mathematics as well as the insufficient application of mobile technologies which are not exploited to the maximum as a means of teaching, the correct use of these would lead to an improvement of online classes and motivation within these; for this reason the creation of a mobile application containing teaching materials for the subject of mathematics is proposed.

It will be innovative, creative, dynamic, with exercises that will strengthen the learning of mathematics, achieving the competencies of each unit of study.

This proposal will directly benefit the 8th grade students of the Francisco Huerta Rendón School, specifically in the subject of mathematics, benefiting in turn the entire educational community in general, as well as the current society that will integrate more prepared students, to transform it according to the current demands.

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use of these would lead to an improvement of online classes and motivation within these.

Within the theory found, it is known that the online modality for the (Ibanez, 2020) is that this education varies from other forms of study since it must have internet and technologies or equipment that support internet connectivity to be able to relate students - teachers, within the characteristics of the online modality is the distancing of people, the use of technological devices, that learning in this modality is independent. (Máxima, 2021). Among the disadvantages of using this modality is that not everyone can afford to have access to both devices and the internet and that the process at the time of being evaluated by teachers is not entirely honest. (UNIR, 2020). While the learning environment must be optimal so that an adequate teaching-learning process can take place, it is for this reason that (Rodriguez, 2019) mentions that the learning environment is everything that surrounds the person who is in a learning process has to do with their learning environment and in turn makes mention that this environment may or may not be favorable for this, depending on their situation. Among the elements that make up the learning environment is the interaction space where not everyone has a specific study room and when mentioning this space, it has to do with where they receive classes, where they do their homework, where they present their learning. (Ayala, 2021).

Within these environments, the different categories that exist in the physical learning environment, which is the environment that surrounds the student, in the classroom, where there is interaction between the teacher and the student, in the same place and at the same time, are made known. It is the duty of the educator to apply teaching-learning models that promote the constant participation of students, adequately managing spaces and available resources. (Ayala, 2021) Another environment is the virtual one,

which is executed by means of fixed or mobile computers, tablets, mobile devices. In turn, it is developed in such a way that the student must be present, as well as not, performing activities outside and within the assigned hours; the type of teaching in this environment promotes the student to be independent at the time of education. (Hernandez, 2020)The other environment is the formal and it is the traditional environment that is made up of institutions that have a structure and are regulated by the system in charge in this case by the Ministry of Education either public or private, at the end of the level is certified by the institution of its completion. (Hernandez, 2020)The last environment is the informal one, which refers to the experiences that the individual acquires through interaction with the environment that surrounds him/her in general, without the need to have a teacher in front of him/her for training. (Ayala, 2021).

It is worth mentioning that within this modality, methodological resources are used, which are the means by which the person helps him/her to perform his/her assigned tasks, it is part of the renewal of science as an intelligent instrument. (Raffino, 2020). There are several methodological resources such as the web page, which is the most accessible one available nowadays, blogs, which are posts on a web page. (Peiró, 2019)blogs that are posts on a site with information that you want to find, another resource is the electronic portfolio. (Alonso, 2021)Another resource is the electronic portfolio which is where the person makes use of clouds where daily or weekly uploads their activities, which will be reviewed by the teacher digitally (Tipán and Sánchez, 2016), the digital whiteboard is another resource which is a set of technological tools such as computer with internet access and projector, where the content will be displayed on a screen or on the wall of the classroom. (UNIR, 2020)Finally, we have the educational software which

is: "a program or application that provides tools to teachers and / or students in order to facilitate learning". (Llamas, 2020).

As school performance in itself is understood as the development of the student in all aspects of which is surrounded especially in the aspect of knowledge (Mondragón et al., 2017); this performance has characteristics related to the aptitude and effort of the student based on its dynamic aspect. It is also the result of what has been obtained as learning which is reflected at the time of evaluating the knowledge related to the static aspect. Linked to learning or giving value judgments and ethical assessment in terms of the student's performance. (Saavedra, 2018).

There are three risk factors in school performance which are the student which is the most important since without him there would be no development of teachers before the teaching process, therefore, teachers will be responsible for these students to want to develop their cognition and interest in delving into new knowledge as they are teaching, consequent to this the student's performance will be reflected through their grades and behavior. The other factor is the school - College which is the place of study where the student will receive his learning, since according to studies the space - student relationship does influence the student's academic performance or school performance. Although the home is the main place where there should be an adequate environment, it must be recognized that the learner spends some hours in learning establishments, so an adequate environment is conducive to acquiring knowledge. Last but not least is the educational system which must have each of the requirements for the student to develop properly with equal opportunities, taking into account the infrastructure of the place of study, which has the necessary resources for educational programs; there are processes such as the delivery of free books,

school breakfast and delivery of uniforms according to the budget given by the government for education. (De La A, 2018).

## **MATERIALS AND METHODS**

This research is made up of several research designs and modalities, one of them is the quali-quantitative modality which brings advantages along with the research that is taking place, such as studying or analyzing the phenomenon in a broader way, likewise many more varied data can be known, resulting in a research with better exploration of the investigated, as for the results that you have with this research modality is that you can have much more reliable results developing possible skills to manage and implement. (Fernández and Baptista, 2016); being according to its field purpose it proceeded to be carried out in the place of the facts, where the problematic situation is presented, in this case the Francisco Huerta Rendón School in the 8th year students, where by means of the observation technique said problem was known. This type of research takes force and is of great relevance since the process of what is studied is present while the research is being carried out; According to its gnoseological objective, it is explanatory since the purpose of this research is to understand the process that is being experienced in this modality, in addition to understanding the reason for low academic performance, which is why an explanatory research will better understand the problem found in all its dimensions and propositive because a problem was diagnosed and a solution is proposed which leads to the improvement of school performance in these 8th grade students of the Francisco Huerta Rendón school, which in turn helps teachers when teaching their classes to achieve the development of skills in their students.

As for the research methods used in this research, the analysis-synthesis method was taken into account, since after several shortcomings that were

found, the method of primordial eagerness to study and improve was chosen, historical-logical, since it is not a research proposal, but has a history that has been affected for years. Among the research techniques used were interview, survey and observation, and among the research instruments, the questionnaire was used for the survey and the interview, while the observation form was used for the observation. Finally, the sample chosen was according to the standard sample given in which 4 classes of the school were used as the main object of study, giving a total of 179 students and applying the sample resulted in 121 students.

## **RESULTS**

As a result of the surveys and interviews obtained it was known that the students were not completely satisfied with this modality and therefore the disinterest in learning diminished as they progressed with this same modality, so they all agreed that a mobile application would be of great help to improve or increase the desire to study; In the same way, teachers and directors mentioned that there was no total preparation to teach classes in this modality and that the only way to get ahead was to receive small trainings given by teachers of the institution themselves, who offered to teach the management of the different platforms that would be used. The research demonstrates the impact of the mobile application for the school performance of these 8th grade students in the subject of mathematics, with this application the online classes are motivating and the exercises of the study units are applied in a dynamic and effective way, an efficient school performance is achieved. This application can be generalized in other contexts as long as they respond to the contents of each exercise, thus showing the importance of the use of computer tools in each content of the subject to develop skills in students.

## CONCLUSIONS

By means of different bibliographic reviews and the observation technique, it was found that the online modality is complicated for those involved in the teaching-learning process, since they are not fully trained to use it. Through surveys and the observation technique, it was found that most of the 8th grade students are not totally satisfied and do not perform adequately in their school performance, due to the modality in which they are, since not all of them have the resources or are not accustomed to manage the study in this way. Finally, the students made their needs known as students, through a survey in which they stated that the creation of a tool or technological application would be of great help and a driving force for their performance, where their participation would be greater thanks to the help that they could obtain through the use of this tool or application.

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