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Use of the online platform and its relationship with academic stress in Jaen high school students (Cajamarca, Peru)

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Abstract*– The use of the online platform for educational services is essential for the achievement of academic objectives and goals, so that in the face of connectivity problems and lack of skills, these become a constraint to the teaching and learning process, causing stress, anxiety, anguish and other emotional problems in the student. The objective of this research is to determine the relationship between the use of the online platform and academic stress in secondary school students in Jaen (Cajamarca, Peru). The research has a quantitative approach, correlational level, non-experimental and cross-sectional design. The population consisted of a total of 120 high school students. Two questionnaires were used: one measuring the use of the online platform (in its three dimensions: use of didactic materials, classroom tutoring system and technological environment) and the other measuring academic stress (in its three dimensions: stressors, symptoms of stress and coping strategies). As result, we report that the use of online platform is high in 30.00% of the sample (n=120), medium in 60.83% and low in the remaining 9.17%. Similarly, academic stress is high in 30.00% of the sample, medium in 57.50% and low in the remaining 12.50%. Finally, there is significant relationship (positive and moderate) between the use of the online platform and academic stress (r=0.678).

Keywords*— Online platform, academic stress, didactic materials, technological environment, coping strategies.

I. Introduction

The COVID-19 virus that originated in Wuhan, China has led the whole world to unexpected and unprecedented changes due to the damage caused to humanity in all its human dimensions, since the pressure of the sanitary emergency restricted the development of basic tasks. On the other hand, in order to avoid the presence of people in public places, a series of orders were applied, including the closing of schools, causing educational services to be non-presential [1]. In this regard, the measures taken by governments, such as compulsory isolation, social distancing and the suspension of social, work and recreational activities, caused high levels of stress in the adolescent population [2]. In addition, the different circumstances generated by virtuality brought with it a continuous process of adaptation of teachers and students, who showed a lack of skills in the management of ICTs, in addition to the limited access to the Internet [1], [3].

In this regard, the United Nations Children's Fund (UNICEF) points out that 1.2 billion students were affected by the closure of educational centers and faced an adverse reality such as online learning; in addition, technological inequality in the population aggravated the global crisis regarding meaningful learning, because more than 100 million children have not reached the minimum reading levels, and the priority should be the transformation of education to avoid intergenerational disasters. Likewise, educational institutions remain closed and only 73% of the 127 countries evaluated are using virtual platforms and local television to offer educational services, although in 71 countries the majority of the population does not have access to the Internet [4].

At the international level, it was reported in Argentina that 2 out of 3 students continue to do their homework all week, which explains the permanent student-school link, despite the closure of schools due to the pandemic and the complicated family situations, where 18% of the student population aged 13 to 17 years, do not have internet at home, and 37% do not have a computer, laptop, Tablet or cell phone to do their homework; which is a reality that evidences prevalent challenges such as, the need to evaluate the way teachers collect academic work, guaranteeing the student free access to this computer network in vulnerable areas and the provision of computers to more students [4],[5]. It should be noted that the results of the study show a huge gap in Internet access and unquestionable lack of technological skills among students. They also point out that the learning that takes place during virtual classes are more demanding and stressful, because they must comply with the review of tasks and scheduled educational activities, in addition, teachers and students were not trained to develop dynamically in a virtual environment [6].

However, distance education embodies the flexibility of educational work in the online space, because it uses in a sustained manner and during its development, the various technological platforms offered by virtuality; emphasizing that it is not necessary to focus on projects with a vision of the future, but to establish a teaching model according to the student's reality and where existing technology is used to achieve better results, because innovation involves the

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application of suitable quality standards, which allow opening new learning and communication scenarios in line with the knowledge society [7], [8].

In Peru, the government, through Decree No. 026-2020, established different transitory and specific measures with the purpose of stopping the spread of COVID-19 in the country, with norms that institute remote work and declare the enormous responsibility that the Ministry of Education (Minedu) assumes as it is empowered to regulate educational teaching in state and private schools, in its different levels and modalities. Subsequently, Minedu itself, through R.V.M. N°088-2020, established new provisions for teachers, which they must assume during the virtual modality in order to formalize the educational service, being subject to monitoring and inspection [1], [9].

Likewise, the National Household Survey (Enaho) describes that the main reasons for dropping out of school at the primary level were economic and family difficulties and lack of motivation; at the secondary level, economic and family difficulties and lack of interest and/or lack of motivation were the causes [10]. Despite respecting the various rules established and the mandatory isolation, teachers continued to develop the various educational programs virtually, complying with the guidelines issued by the MINEDU, which were assumed without restrictions by students and teachers, who initially did not have adequate skills and abilities for the use of digital platforms, being the lack of Internet access one of the major limitations for better results of the educational process. In this sense, virtual learning environments (VLE) should be strengthened in order to ensure the continuity of educational work from the non-presential, given the unprecedented health situation caused by coronavirus that the population is experiencing, as the best alternative for the progress of academic activities [11].

Therefore, the problems emerged in the educational context, evidenced the sad reality of Peruvian education, where the steps taken by the MINEDU were structured during the process of the pandemic context, but teachers were anxious to create strategies or seek methodologies to consolidate the teaching process. However, for a better productivity of virtual environments in a pandemic situation, an adequate follow-up should be carried out in order to assess the achievements reached during the educational process, which is based on cognitive, procedural and attitudinal skills, which should be assumed by teachers and students, who should adjust to the virtual modality [12]–[14].

In relation to stress, which is a response mechanism and a habitual and protagonist expression as a result of the constant changes suffered by the pandemic, which continue to be news in the various media, transcending the academic and everyday environment [15], [16]; however, it is necessary to explain that it is a relatively new term, since recently they have begun to distinguish itineraries on a process of entrenchment [17],[18]. In this regard, various international studies agree on the diversity of stress typologies, such as academic or professional stress [19].

Consequently, society continues to face a generalized pandemic, which continues to cause the suspension of non-essential activities and has restricted the normal functioning of basic services, due to the application of preventive and provisional measures to prevent the massive contagion of people with the disease. All this led to the confinement of families in their homes, having to adapt to a new lifestyle and where there were food problems, stages of stress, anxiety and scenarios of family violence. A situation that can be called pandemic pressure, because it is experienced not only at the parental level, but also at work or school, with this classification being reported at high and medium levels [5].

Likewise, society continues to resist the abrupt changes due to the aftermath of COVID 19, since individuals are exposed to a series of demands and requirements during the interval of their lives, where adolescents show a lack of competencies and skills in the use of technological platforms, lack of autonomy and excessive school work, which have increased stress levels [20].

Real-Loor and Marcillo-García evidenced the need for the educational system to implement adequate pedagogical resources and tools to promote an inclusive, supportive and cooperative culture with opportunities for everyone to have a quality education according to their needs. In the conclusions it was found that the student is the main figure in the teaching process, focused on being the architect of the evolution and transformation of the educational system, where the right resources will be useful to achieve the expected results [21]. In addition, Armenta, et al., (2020), argues that, it can be positive stress as a warning procedure, it is caused by the accumulation of educational activities that students must exercise during the course of their training, being necessary to seek relaxation spaces or recreational activities that enable the increase of motivation that will finally contribute in mental and physical health [22].

Likewise, Gros conceptualizes that virtual spaces for educational training in students are significant if the virtual classroom environment is optimized with the management of information accompanied by the teaching guide. The teaching role plays a transcendent role in the collaborative work required in the virtual line. Thus, the various virtual tools that exist require teachers to plan the achievement of the expected objectives in order to improve the teaching process [23].

In this same sense, the online platform is divided into 3 dimensions detailed below and in Fig. 1:

a) Use of didactic materials.
b) Classroom tutoring system.
c) Technological environment.

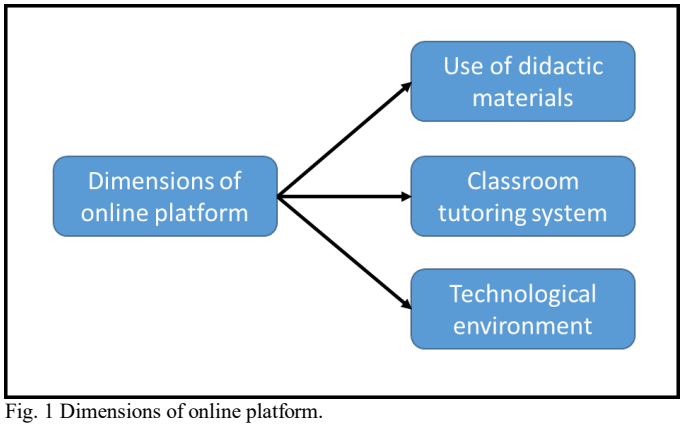

Fig. 1 Dimensions of online platform.

Dimension 1: Use of didactic materials, which have characteristics such as contents of materials to apply the teaching-and-learning-process with students: paper and digital documents, audioconference, videoconferences and instructional software.

Dimension 2: Classroom tutoring system, which indicates that it is fundamental to organize creative virtual learning spaces based on democratic expressions of argumentation and opinions of ideas shared with students through multimedia files. It should be noted that this approach is oriented to focus on the student who is not only a consumer of information, but should be a participant in his or her own learning environment [23].

Dimension 3: Technological environment, which are essential in the educational field, because they favor the interactivity of educational environments and allow the increase of cognitive productivity [24].

Distance education is a pressing social need and demands urgent structural changes, from a new paradigm approach of both the teacher and the student. Consequently, the pedagogical activity needs a renewed orientation of modality to achieve education in an emerging social context of technological innovation and where collaboration, autonomy, teamwork and adequate study habits of students are strengthened. This requires basic elements of educational models, which are integrated with technological resources, learning activities and teacher support, who must create educational spaces and learning situations for student interaction with school activities, which require resources, teaching materials and collaborative learning, which involves sharing and managing resources to discuss and argue in autonomous and group spaces, with support and guidance at all times [25].

Virtual learning is an extensive work and efforts have been redirected to the formation of digital skills of students. It should be noted that, in the face-to-face educational activity the teacher is the one who has the knowledge and the student receives the information, but in the current training the teacher is a guide and accompanier of the student during the teaching-learning process, where he uses various virtual platforms and applies continuous evaluation and feedback [26].

Undoubtedly, the changes in the educational system due to the pandemic have brought great challenges to educational institutions. Likewise, Charry and Ibáñez refer that the use of the virtual classroom for the teaching of mathematics takes into account dimensions related to the dynamization of teaching focused on the achievement of learning. Teachers recognize the benefits of the use of ICT and virtual environments for education; however, studies show that they do not handle them adequately or do not know how to use them [27]. On the other hand, Carpio and Arana reveal the importance and positive impact of discussion forums as a tool to improve learning, because of their usefulness for the discussion of content, forming an autonomous process of active and participatory learning, developing inferential skills and critical thinking, because they are transcendent elements for the evolution of the educational process [28].

Also, Velásquez indicates that teachers show difficulties when using VLEs, which are necessary tools for knowledge transfer and when they are not properly applied, their effectiveness decreases. Therefore, the incorporation of virtuality has had its ups and downs and the most outstanding one is the lack of familiarity in the use of ICTs for the development of mathematics [29].

Likewise, Zambrano-Orellana, (2021) states that virtual learning resources contribute to students, with the management of didactic tools for the development of competencies and knowledge. It is important to highlight that teachers using virtual tools have a significant impact on the educational training process [30]. In addition, Díaz and Castro indicate that it is necessary to design a learning module that instructs and potentiates the didactic resources provided by the platforms to favor the quality of virtual educational services [31].

Academic stress can increase in students and teachers due to the demands of the school environment, being necessary to measure this phenomenon to avoid the emotional impact on both groups. For Barraza it is the structured that is externalized that is exhibited in the psychological and adaptive behavior in the face of adverse events or circumstance for the student in relation to activities within the work environment, school, roles and obligations that influence as a stressor. Students experience stress when during their educational activities they have an overload of tasks either for school or home, where it is considered, if they do not have skills to do their homework, do not have an adequate environment to concentrate or to perform their educational activities, the limited time they have to perform school activities, limitations in understanding for homework or permanent evaluations [18]. The dimensions of academic stress are detailed lines below (also in Fig. 2):

a) Stressors.
b) Symptoms of stress.
c) Coping strategies.

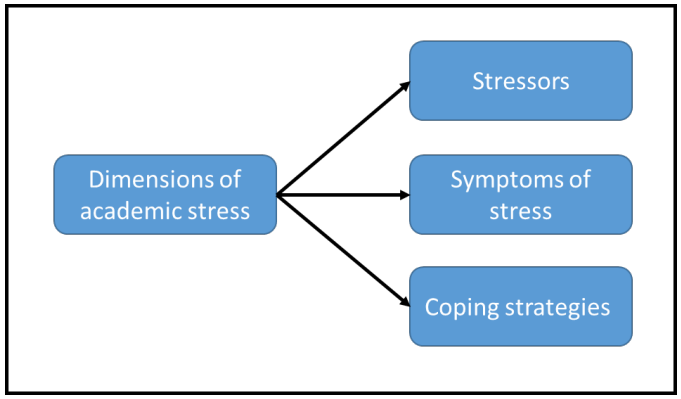

Fig. 2 Dimensions of academic stress.

Dimension 1: Stressors, which is the stress agent that induces risk situation that can be threatening resulting in the person the opportunity for resistance, adaptation and change.

Dimension 2: Symptoms of stress, which indicates that there are 3 reactive behaviors to educational stress: Symptomatology-physiological: are physical manifestations that are related to excessive sweating, headache, fatigue, increased blood pressure, stomach pain, back pain, sleep disturbance, hives, altered appetite and weight. Psychic symptomatology: these are the manifestations that occur in the person related to emotions such as sadness, irritability, restlessness, tiredness with decay, feeling isolated, unmotivated to make decisions, feeling insecure about their abilities, lack of concentration, as well as experiencing existential conflicts [17]. Behavioral symptomatology: these are manifestations presented by the individual or person to have a predisposition to consume harmful substances such as excessive consumption of cigarettes, in addition to being forgetful, showing inadequate interpersonal relationships, having conflicts among peers, uncontrollable desire to eat or lack of appetite and regularly being unaligned in their physical appearance.

Dimension 3: Coping strategies, which are strategic actions that redesign or change to become a learning breakthrough to achieve higher skills for example in the realization of goals or functions, search of databases or information, spirituality, assertiveness and self-confidence [17].

Regarding academic stress, the application of psychoeducational strategies can reduce the levels of academic stress, which allows students to perform adequately and to innovate their lifestyles [24]. Likewise, the use of social networks has positive results, because it helps to distract and generates pleasant sensations in the person; but when there is an excessive use, the person needs more time to compensate for that created need, because it demands time and becomes a distractor of studies [25]. In this same line, Estrada refers that adequate study behaviors are linked to low levels of stress [32].

Urquía indicates that high levels of stress in students lead to a greater use of aggressive humor, which impairs communicative relationships, conflict resolution and emotions. The author agrees that the stages of stress are partially related to the diversity of forms of humor, although not all of them are related to stress in schoolchildren [33].

It should be noted that virtual learning environment is an online space where educational services are offered providing educational materials through the use of multimedia, to argue relevant content to strengthen the teaching and learning processes [34]. Academic stress is a problem suffered by students when stressors related to school environment activities impact their performance. The behavior of both variables within the context of pandemic, have lacked technological resources and basic skills to adapt to the virtual teaching mode, and that became a limitation for the development of this modality.

Likewise, the students report having problems with Internet access, they do not have technological equipment and the electricity service is not permanent, which is causing them stress, frustration and anguish, because they cannot carry out their school activities and even express the desire to give up their studies.

In reference to the teacher's competencies, the students state that they have observed a lack of skills in the management of virtual environments, offering a class that is not very dynamic and interactive, which generates boredom and a desire to leave the classroom.

Therefore, it is relevant to measure the variables of the study to serve as a basis for future research and to create strategies and improvement plans in relation to the existing situation. In this sense, it is urgent to motivate adolescents to assume autonomous learning and the practice of study habits that favor the teaching processes in the virtual environment.

II. Methodology

The present study had a quantitative, correlational, non-experimental, cross-sectional design [35], and the population consisted of a total of 120 students; non-probabilistic convenience sampling will be used. Two questionnaires were applied whose author is Gros whose questionnaire is the use of online platform with 20 items and Likert-type response with its three dimensions: use of teaching materials, tutoring system and technological environment [23]. Likewise, Barraza author of the academic stress instrument (SISCO), with 21items Likert scale with its three dimensions: stressors, symptoms and coping strategies [17].

Both instruments were validated by experts and a pilot test was conducted, obtaining a Cronbach's alpha of 0.9 and 0.8, respectively. The corresponding permissions were requested from the institution and then the data collection will be carried out, which will later be processed and analyzed statistically, using the Microsoft Excel program, by coding the responses acquired according to the established variable. The results are presented in tables with percentages and frequency.

Throughout the research process, the ethical principles of research was be complied with, requesting authorization for the execution of the study, as well as informed consent from each person included in the research.

Main research objective: to determine the relationship between the uses of online platform and academic stress in Jaen high school students.

III. Results

Table I shows that the use of online platform is high in 30.00% of the sample, medium in 60.83% and low in the remaining 9.17%. Similarly, Table II shows that academic stress is high in 30.00% of the sample, medium in 57.50% and low in the remaining 12.50%.

TABLE I
FREQUENCY DISTRIBUTION OF THE VARIABLE "USE OF ONLINE PLATFORM"

Level	Frequency	Percentage
Low	11	9.17%
Medium	73	60.83%
High	36	30.00%

TABLE II
FREQUENCY DISTRIBUTION OF THE VARIABLE "ACADEMIC STRESS"

Level	Frequency	Percentage
Low	15	12.50%
Medium	69	57.50%
High	36	30.00%

Finally, Table III shows the results of the calculated correlations. The results show that:

There is significant relationship (positive and moderate) between the use of the online platform and academic stress (r=0.678).

There is a significant (positive and strong) relationship between the use of the online platform and stressors (r=0.714).

There is a significant (positive and moderate) relationship between the use of the online platform and symptoms of stress (r=0.569).

There is a significant relationship (positive and moderate) between the use of the online platform and coping strategies (r=0.455).

TABLE III
CORRELATIONS

Correlation	Spearman's rho	Sig.	Interpretation
Use of the online platform & academic stress	0.678	<0.001	Moderate positive correlation
Use of the online platform & stressors	0.714	<0.001	Strong positive correlation
Use of the online platform & symptoms of stress	0.569	<0.001	Moderate positive correlation
Use of the online platform & coping strategies	0.455	<0.001	Moderate positive correlation

IV. Discussion

The findings found in the study there is a moderate positive correlation between the variables online platform use & academic stress (p. = <0.001; r = 0.678). These results coincide with the study of Corrales [11], who found that there is a correlation between both variables. He also states that the various activities offered by virtual platforms provide teachers and students with the facility to establish individualized content, to achieve a significant impact on the social skills of students, but nevertheless, not having the skills of technological tools leads to frustrations and levels of academic stress causing negative behaviors in this situation.

In reference to the statements of the various authors, it can be asserted that the use of the virtual classroom is carried out continuously in times of pandemic, but teachers need to be trained to ensure the quality of educational services aimed at students. It is also necessary for teachers to be able to organize themselves thoroughly to manage time, select materials and resources suitable for self-management of independent learning and collaborative work among all.

There is no doubt that the scientific evidence in the literature on virtual forums, debate and argumentation, reaffirm the improvement of student learning and favor the achievement of good academic results by facilitating and enhancing the exchange, transmission of information and communication between the members involved in the process, and where active methodologies can favor the achievement of analytical, critical, problem-solving and theory-practice connection skills.

Indeed, teachers need to innovate and contextualize learning in relation to social changes that demand a redefinition of the educational task, where they still remain as a simple transmitter of information. The fundamental task of teachers is to provide opportunities for students to enhance their skills, which will materialize in the presentation of novel problem situations that must be contextualized to their environment, selecting paths and processes for possible solutions.

It should be noted that the virtual learning environment and academic stress in the teaching process in high school adolescents during the time of pandemic identified deficiencies in the use of the virtual learning environment and stress problems that are generated in students during the development of the educational process. It should be specified that

strengthening the limitations evidenced in the use of virtual environments, which are spaces and/or educational platforms that contain countless computer materials that serve for the didactic interaction of learning processes, will significantly reduce stress levels in the face of demanding situations that are generated during the academic and social practice of students, with the purpose of improving educational conditions for the benefit of adolescents.

Regarding the correlations between the use of the online platform and its stressors dimension, it was found that there is a relationship (p. = <0.001; r = 0.714). These results coincide with what was found by Reyes [36] who stated that there is a significant relationship producing a change of study modality (from face-to-face to virtual) has generated emotional consequences such as academic stress [2].

Regarding the correlation between the use of the online platform and symptoms, the value of (p. =< 0.001; r = 0.569) was found. These results coincide with the findings found by Terrazas [37], who indicates that there is significance between both variables so the presence of symptoms such as burnout is considered weak; the fear of getting sick by COVID-19 as school dropout, moderate; concluding that these factors can influence directly or indirectly to school dropout [37]. Likewise, this situation in the long term causes academic overload, stress, frustration and dropout [38].

The emotional aspects linked to the learning process, educational neuroscience or neurolearning is linked to active pedagogical and didactic strategies, emphasizing the importance of motivation, emotion and awakening the curiosity of students. It is necessary to train teachers to teach how to think, because only by knowing the students' attention mechanisms can the didactic procedures be improved.

In relation to the use of the online platform and coping strategies, it was found that the value was (p. = <0.001; r = 0.455). The results coincide with Toasa [39], who found that schoolchildren perceive that there is an association between learning with the use of the virtual platform and stress, generating situations of uncertainty and anxious traits when performing complex tasks when learning strategies are not applied by the teacher. The solution to the problems is directed to know the levels of stress and anxiety that students may have, the teacher has a great influence, and so he can use interactive methodologies and incorporate active breaks decreasing the levels of these pathologies, in order to stimulate the skills and abilities of schoolchildren [39].

In this sense, the management of learning in the virtual environment in times of pandemic, is a relevant issue because it involves an integral dynamic that promotes autonomous learning and the creation of a culture of critical appropriation of knowledge, where with the use of technology students participate in their own learning process and with the guidance of the teacher improve their academic performance and strengthen the development of virtual skills; where the practice of learning strategies plays an essential role, such as collaborative work and interactions achieved by students in the virtual environment, because it will be the theoretical support of the subjects.

In the same way, Alejo & Aparicio [40] point out that it is likely that face-to-face education will cease to be to give way to virtual education according to the advances of ICTs, from a constructivist, contextualized, interactive and shared responsibilities approach. On the other hand, Bucheli-López [41], emphasize that students must be motivated to generate optimal states when receiving learning.

Teachers are responsible for supporting students to build schemes and representations, for which they must facilitate productive learning situations to lead them to the expansion and diversification of their action schemes, and as they develop them, they will become more capable of facing more complex situations. In this sense, the educational model based on student activity is a social process of online learning to achieve knowledge and competencies based on the expected results, as planned.

Finally, it is relevant to state that teachers continue to adapt favorably in the use of virtual platforms, to ensure the achievement of expected objectives, and with strenuous efforts so that students do not discontinue the educational service, however, it is necessary to strengthen the capabilities in the management of virtual tools, to create interactive environments in the construction of knowledge and meaningful learning. Regarding the virtual learning environment, in today's globalized and technological environments, it is an essential tool for the development of daily activities within the social environment, because they are contexts where essential services are provided, including education. Also, digital spaces comprise various platforms and tools that allow the development of learning and where it is possible to innovate because the intercommunication is interactive and is supported by social networks. The accompaniment and stimulation allow to reach different better results in the students, taking into account that the stages of motivation generate invaluable moods in the person and allow him/her profuse significant learning.

Undoubtedly, the virtual learning environment needs necessary changes in the curriculum, with the purpose of adapting the modern and facilitating flexibility for the achievement of expected objectives, during the development of the educational process from the application of ICTs.

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