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Artículos científicos

Currículo escolar: retos de la enseñanza-aprendizaje ante las secuelas postpandemia por la covid-19

School curriculum: challenges of teaching-learning in the face of the post-pandemic consequences of Covid-19

Currículo escolar: desafios do ensino-aprendizagem diante das consequências pós-pandemias do Covid-19

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Resumen

El objetivo de la presente investigación fue documentar la enseñanza y el aprendizaje de estudiantes universitarios durante la contingencia sanitaria, así como el abordaje de los contenidos del currículo ante la pandemia de la covid-19. La metodología utilizada fue cuantitativa. La muestra elegida estuvo compuesta por 291 estudiantes de las preparatorias 2 y 7 de la Universidad Autónoma de Guerrero, México. Se consideraron cuatro variables ordinales con base en la relación profesor-estudiante para contrastar su correlación a través de la prueba estadística no paramétrica Rho de Spearman y su significancia; se obtuvieron valores de significancia estadística inferiores a $p \leq 0.05$, con débil correlación entre las variables. La coincidencia entre ambos grupos de variables analizadas fue en escala de nunca y casi nunca. Los resultados del análisis de correlación entre las variables indicaron que no existe vinculación entre la enseñanza impartida por los docentes y los conocimientos y aprendizajes que adquirieron los estudiantes. El estudio mostró que los acontecimientos,



sucesos y problemáticas que se suscitaron por la emergencia sanitaria de la covid-19 escasamente fueron integrados a los contenidos curriculares y a la enseñanza impartida por los profesores; de esta forma, los estudiantes consideraron que sus aprendizajes y conocimientos sobre temas emergentes por la covid-19 fueron escasos. Se concluyó que no existió un engarzamiento sobre temas emergentes provocados por la pandemia de la covid-19 con el currículo escolar.

Palabras clave: aprendizajes, covid-19, desafíos en la educación, educación virtual, sistema educativo.

Abstract

The objective of the present research was to document the teaching and learning of university students during the health contingency, and the approach of the curriculum contents in the face of the Covid-19 pandemic. The methodology used was quantitative. The sample chosen was 291 students from the 2 and 7 high schools of the Autonomous University of Guerrero, Mexico. Four ordinal variables were considered based on the teacher-student relationship to contrast their correlation through Spearman's non-parametric Rho statistical test and their significance; statistical significance values below $p \leq 0.05$ were obtained, with weak correlation between the variables, the coincidence between both groups of variables analyzed was on a never and almost never scale. The results of the correlation analysis between the variables indicated that there is no link between the teaching given by the teachers, with the knowledge and learning acquired by the students. The study showed that the developments, events and problems that arose from the health emergency of the Covid-19 were scarcely integrated into the curriculum content and teaching by teachers; in this way, the students considered that their learning and knowledge on emerging issues by the Covid-19 were scarce. It was concluded that there was no linkage on emerging issues caused by the Covid-19 pandemic with the school curriculum.

Keywords: Learning; Covid-19; challenges in education; virtual education; educational system.

Resumo

O objetivo da presente pesquisa foi documentar o ensino e a aprendizagem de estudantes universitários durante a contingência sanitária, e a abordagem dos conteúdos do currículo diante da pandemia da Covid-19. A metodologia utilizada foi quantitativa. A amostra escolhida foi de 291 estudantes das preparatórias 2 e 7 da Universidade Autônoma de Guerrero, México. Foram consideradas quatro variáveis ordinais com base na relação professor-estudante para verificar a sua correlação através do teste estatístico não paramétrico Rho de Spearman e a sua significância; foram obtidos valores de significância estatística inferiores a $p \leq 0.05$, com fraca correlação entre as variáveis, a coincidência entre os dois grupos de variáveis analisadas foi em escala de nunca e quase nunca. Os resultados da análise de correlação entre as variáveis indicaram que não existe relação entre o ensino ministrado pelos docentes, com os conhecimentos e aprendizagens adquiridos pelos estudantes. O estudo mostrou que os acontecimentos, eventos e problemáticas suscitados pela emergência sanitária da Covid-19 foram pouco integrados aos conteúdos curriculares e ao ensino ministrado pelos professores; desta forma, os estudantes consideraram as suas aprendizagens e conhecimentos sobre temas emergentes pela Covid-19 escassos. Concluiu-se que não existia um engajamento sobre temas emergentes provocadas pela pandemia da Covid-19 com o currículo escolar.

Palavras-chave: Aprendizagem; Covid-19; desafios em educação; educação virtual; sistema educativo.

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Introduction

Humanity has suffered a series of unexpected events in all areas due to the pandemic that had a surprising impact on society at the beginning of 2020. In the educational field, various organizations have warned about threats, a high level of desertion and economic impacts. Hence, they have expressed their concern about the consequences and social inequalities evidenced during the pandemic in the most disadvantaged sectors (World Bank Group, 2020; United Nations Educational, Scientific and Cultural Organization [Unesco], 2020; 2021; Organization of Ibero-American States for Education [OEI], 2020).

Similarly, the United Nations Children's Fund [Unicef] (2020) ensures that the different challenges faced by school institutions and education, in general, are extreme, and have to do with the design of processes that allow education under different dynamics, in a



complex context and full of uncertainty in the face of the unexpected events generated by covid-9.

In this sense, the school curriculum, as the backbone of formal education, is present in all educational systems as a road map, so its approach and analysis becomes complex and challenging due to its different connotations. For example, for theorists like Stenhouse (1975), the educational curriculum refers to an attempt to communicate the essential principles of an educational proposal, while for Carr and Kemmis (1988) it is a social construction influenced by the historical context, that is, , political interests, hierarchies and social stratification. For De Alba (1991), the curriculum is a political-educational proposal with a series of cultural elements that involves the knowledge, beliefs, values and customs of a society.

Magendzo (2016), for his part, explains that the curriculum is based on a scientific and rational procedure that considers all the factors of the educational act to rationally plan teaching and learning. Instead, for Giraldo et al. (2017) the curricular approaches reflect the vision of the world, the values and the attitudes that outline the educational processes.

In this analysis, four approaches established by Posner (1998) for the curricular planning process are highlighted: The procedural approach answers the question of what steps should be followed in the organization of the curriculum; the description responds to what the people in charge of curricular planning should really do in practice; the conceptual one responds to what are the elements of curricular planning and how they are related to each other; finally, the critical approach is responsible for responding to which interests are being served, who favors and who does not.

On the other hand, Marsh and Willis (2007) define the curricular approach as a set of beliefs about the curriculum and curricular work that can be explicit or implicit, and are in charge of giving meaning and orientation to curricular proposals and practices (Giraldo et al. al., 2017). Similarly, Coll et al. (1995) point out that learning is the product of a prolonged process of construction and elaboration of schemes of educational experiences that have to do with personal development and that are conditioned by their cognitive competence and by the previous knowledge of the students. This coincides with the approaches of Díaz-Barriga (2003) on the flexibility of the models of active participation, analysis and permanent monitoring of learning.

Similarly, Gervacio and Castillo (2019) argue that the school curriculum must respond to current needs and demands to focus on the development of cognitive abilities and

skills, as well as the management of information and communication technologies, since This will help students to have a comprehensive training, with necessary skills for a better professional and social performance, which will allow them to improve their quality of life.

In this sense, the recommendations of the Organization of Ibero-American States for Education [OEI] (2020) regarding reviewing the contents and meaning of the curriculum are particularly relevant, since it considers that they are currently excessively fragmented and overloaded, for which reason it recommends prioritize essential learning and redesign it based on the new challenges, needs and demands of today's society.

In the case of Mexico, the country has responded to the new demands and needs of the context, which is why an educational reform has been launched at the basic level. This contemplates changes in the school curriculum and in the reorientation of the pedagogical processes. For this reason, the review and updating of the curricular contents of the Mexican educational system is of special importance, particularly those taught at the Autonomous University of Guerrero.

In this sense, it should be noted that both the Undersecretary of Higher Secondary Education (SEMS) (2021) and the Autonomous University of Guerrero (UAGro) itself base their lines of action on the principles and recommendations of the 2030 agenda, especially objective 4. of the Sustainable Development Goals (SDGs). This offers guidelines and lines of action towards economic, social and environmental sustainability, as well as attention to priority issues such as extreme poverty and inequality in all its dimensions. (Secretaría de Educación Pública [SEP], 2022).

However, it is pertinent to point out that the current Educational Model of the UAGro [MEUAGro] (2013), was designed at the time on the paradigm of social constructivism with a competency-based approach that seeks to promote the sustainable development of the State and the country.

In this sense, UAGro itself has recognized the need to update its educational model to incorporate comprehensive education with a perspective of social responsibility, quality and relevance. This seeks to respond to current social demands, characterized by meeting the guidelines of the Common Curricular Framework for Higher Secondary Education (MCCEMS), without renouncing its pedagogical philosophical framework, as well as its mission and vision (Institutional Development Plan [PDI], 2017-2021).

Based on the above, it can be ensured that the present investigation is pertinent and relevant, since it accounts for the management that was given to the curriculum and the

didactic-pedagogical intervention that teachers have had in their virtual classes during the covid pandemic. -19.

Specifically, the objective of this work was to document the teaching and learning acquired by university students from the health contingency, as well as the approach to the contents of the curriculum in the face of the covid-19 pandemic. For this, the following hypotheses were formulated:

H₀: There is no agreement between the knowledge acquired by students and the teaching of teachers to respond to the covid-19 contingency.

H_a: There is a concordance between the knowledge acquired by students and the teaching of teachers to respond to the covid-19 contingency.

Methodology

Study site

The present work was carried out in the preparatory schools No. 2 and No. 7 belonging to the Autonomous University of Guerrero, in the municipality of Acapulco, Guerrero.

Methodological design

This research was carried out during the February-July 2021 school term, after a year and a half of working in the virtual modality. In this sense, it was considered pertinent to investigate and document the perception and knowledge that students acquired in relation to the problems caused by covid-19.

For the present investigation a quantitative methodology was used. A survey was used as a data collection technique, since —according to Gómez (2012) and Hernández-Sampieri and Mendoza (2018)— it is the appropriate instrument for collecting quantitative data. For the analysis of the results, which were multiple options, the Likert scale (1932) was used. The template with the data from the Google Forms survey was exported to the statistical program SPSS (Statistical Package for the Social Sciences) (version 25) for analysis and comparison of the variables (Castañeda et al., 2010).

The instrument was submitted to evaluation by a team of experts to validate it and verify the clarity of the wording of the items. The instrument has 22 items divided into 5 sections. Subsequently, to evaluate the metric properties of the instrument and corroborate

its suitability, the survey was applied to a group of 30 student volunteers. Then, a Cronbach's alpha statistical test was performed with the SPSS software (Rodríguez-Rodríguez and Reguant-Álvarez, 2020), which yielded 86% reliability.

Following the approaches of García-García et al. (2013), the formula for finite populations was applied (figure 1). This made it possible to choose a sample size of 291 students out of a total of 400. The sampling was stratified probabilistic (Otzen and Manterola, 2017) with two groups (fourth and sixth semester) from high schools No. 2 and No. 7.

Figure 1. Formula for calculation of sample size

$$n = \frac{N * Z_{\alpha}^2 * p * q}{d^2 * (N - 1) + Z_{\alpha}^2 * p * q}$$

Source: Own elaboration with data from García-García et al. (2013)

The survey was prepared in Google Forms and sent by institutional mail to the student groups of the aforementioned high schools. The students of each group and enrolled in both schools offered their willingness to participate voluntarily in the present investigation. Of the total of them, 55% corresponded to high school number 2 and 45% to high school number 7. Of this sample, 65% corresponded to the female gender and 35% to the male gender.

Variables chosen

The variables chosen were four of the ordinal type, selected based on the teacher-student relationship, which were divided into two groups to contrast their correlation and statistical significance.

In this way, and with the purpose of knowing if the students have understood the problems derived from the pandemic and how to face the new reality, two variables related to the approach to the problems by the teachers, and the knowledge acquired by the teachers, were contrasted. the students.

Group 1

V1: Your teachers addressed the contents and the problems of covid-19 during their classes.

V2: You obtained knowledge and learning about the problems and impacts caused by covid-19.

The second group of variables had to do with the contrast between the approach of socio-

environmental issues related to covid-19 by teachers and the perception and knowledge that students obtained on this topic.

Group 2

V3: Your teachers addressed content with socio-environmental themes related to covid-19.

V4: You are able to perceive and understand the complexity of the socio-environmental problems caused by covid-19 at a local, national and global level.

With these four mentioned variables and with the support of the SPSS program (version 25) (Castañeda et al., 2010), through the Kolmogórov-Smirnov analysis, it was verified if the variables complied with a normal distribution (Juárez et al., 2002; Zar, 1996), which did not happen. For this reason, it was determined to carry out a correlation analysis between variables by means of a non-parametric statistical analysis of correlation called Spearman's Rho. (Kendall, 1938).

Results

Statistic analysis

Variables to be correlated group 1

Your teachers addressed content on the problems and their impacts derived from the covid-19 pandemic in class sessions.

You obtained knowledge and learning about the problems and impacts caused by the covid-19 pandemic.

Based on the data from the normality test, Table 1 shows that these variables did not present a normal distribution. (0.000, $p \leq 0.05$).

Table 1. Normality test.

	Kolmogorov-Smirnov		
	Statistical	gl	Sig.
Your teachers addressed content on the problems and their impacts derived from the covid-19 pandemic in class sessions.	.277	291	.000
You obtained knowledge and learning about the problems and impacts caused by the covid-19 pandemic.	.265	291	.000

Source: Own elaboration

These two variables were correlated through the non-parametric Spearman's Rho test, with a value of 0.165, less than 1; and a significance value of $p = 0.002$ less than $p \leq 0.05$. The result was a weak correlation (table 2).

Table 2. Spearman correlation coefficient

	You obtained knowledge and learning about the problems and impacts caused by the covid-19 pandemic.	
Your teachers addressed content on the problems and their impacts derived from the covid-19 pandemic in class sessions.	Spearman's Rho correlation coefficient	.165
	Sig. (bilateral)	.002
	N	291

Source: Own elaboration

The results of this test showed that the teachers did not consider the approach to the impacts of the pandemic. This means that within the virtual didactic planning it was not a priority to deal with what was happening at that time at a global, national and local level. Consequently, the students did not receive information in a systematic way within the virtual classrooms.

Variables to correlate group 2:

- ✓ Your teachers addressed content with socio-environmental themes related to the covid-19 pandemic.
- ✓ You are able to perceive and understand the complexity of the socio-environmental problems caused by covid-19 at a local, national and global level.

The two indicated variables did not follow a normal distribution either (0.000, $p \leq 0.05$), as shown in Table 3.

Table 3. Normality test.

	Kolmogorov-Smirnov		
	Statistical	gl	Sig.
Your teachers addressed content with socio-environmental themes related to the covid-19 pandemic.	.253	291	.000
You are able to perceive and understand the complexity of the socio-environmental problems caused by covid-19 at a local, national and global level.	.201	291	.000

Source: Own elaboration

The relationship between these two variables was performed using Spearman's Rho statistical test, from which a weight of 0.196 was obtained and a significance of $p = 0.000$ less than $p \leq 0.05$, which means that there is a weak correlation between the variables (table 4).

Table 4. Spearman correlation coefficient

	You are able to perceive and understand the complexity of the socio-environmental problems caused by covid-19 at a local, national and global level.	
Your teachers addressed content with socio-environmental themes related to the covid-19 pandemic.	Spearman's Rho correlation coefficient	.196
	Sig. (bilateral)	.000
	N	291

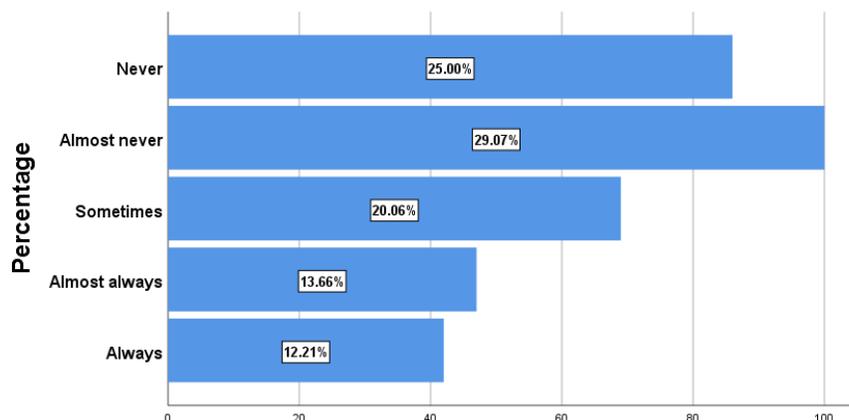
Source: Own elaboration

Based on the analysis of correlation and statistical significance between the variables, the research hypothesis H_0 is accepted, that is, "There is no agreement between the knowledge and learning acquired by the students and the teaching of content on emerging events and topics." by teachers, local, national and global topics on the health emergency caused by the covid-19 pandemic. In this sense, the significance values of 0.002 and 0.000, which are lower than $p \leq 0.05$, observed significant differences in the relationship between these variables.

The result of the correlation of the variables corresponding to group 1 is observed in Figure 2, where 25% mentioned that issues related to the problems and impacts of the pandemic were never addressed, while 29.07% considered that they were almost never addressed. These topics were discussed in class. Likewise, 20.06% reported that only

sometimes, 13.66% that almost always, and 12.21% that content with problems related to the pandemic was always addressed (figure 2).

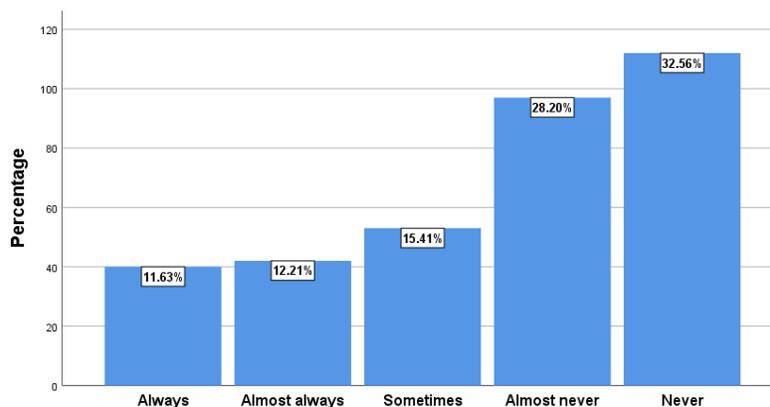
Figure 2. Content addressed by teachers on issues related to the pandemic



Source: Own elaboration

Regarding the knowledge and learning that students obtained about the problems and impacts caused by the covid-19 pandemic, 32.56% considered that they were never addressed, 28.20% almost never, 15.41% sometimes, the 12.21% almost always, and 11.63% thought that they always obtained knowledge and learning about the problems caused by the current pandemic (figure 3).

Figure 3. Knowledge and learning obtained by students about the pandemic

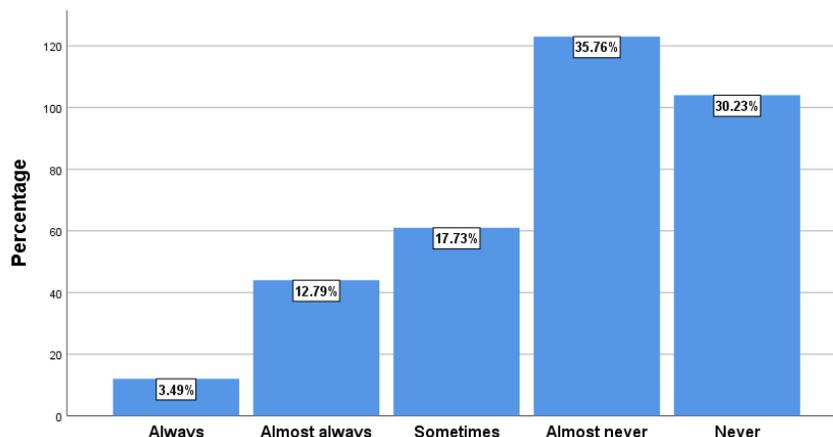


Source: Own elaboration

Regarding the correlation of the variables corresponding to group 2, it was shown that the teachers partially addressed the socio-environmental problems and impacts related to the health pandemic, since 35.76% of the students considered that they almost never addressed

content related to the impacts, 30.23% thought never, 17.73% sometimes, 12.79% almost always, and 3.49% considered that socio-environmental issues related to the health pandemic were always addressed (figure 4).

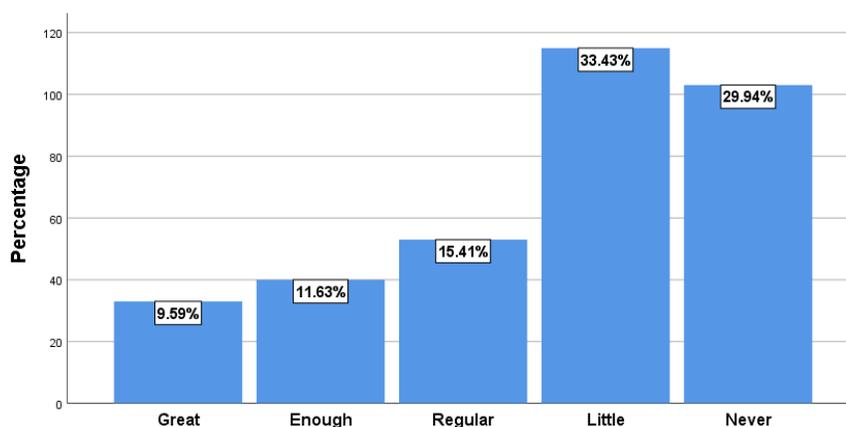
Figure 4. Socio-environmental issues addressed by teachers



Source: Own elaboration

Finally, regarding whether the student was capable of perceiving the complexity of the socio-environmental problems that the covid-19 pandemic has caused at a local, national and global level, 29.94% said never, 33.43% considered that little, 15.41% chose the regular option, for 11.63% it was enough and for 9.59% the approach given to the subject was great (figure 5).

Figure 5. Perceptions of students of socio-environmental problems



Source: Own elaboration

Discussion

The present investigation was based on the proposal of Morales (2014), who argues that education must be carried out by teachers who assume the role of reflective, transforming intellectuals and aware of the social problems of the school. In accordance with this premise, the reflections of Díaz-Barriga (2003) are taken up, who points out that the curriculum involves methodological planning, evaluation, objectives, learning and teachers as a whole for its correct application.

Undoubtedly, what these researchers expose was considered as a reference for this work, which is related to the curricular contents, the methodologies, the teacher and, of course, the student as the axis of the investigation on the perceptions and problems that were being Living at the time of the covid-19 pandemic.

In this sense, the research documented the approach that the teacher made on the curricular contents before the problems that the students lived; In this context, it becomes important to return to the reflections of some theorists such as Wilfred Carr and Stephen Kemmis, who promote action research as a way in which teachers can carry out reflective and investigative processes from the classroom and for the classroom (Carr and Kemmis, 1988), as was done in this research, where an attempt was made to investigate the approach to curricular content within the virtual classroom.

However, when reflecting on the educational curriculum, the contributions of Stenhouse (1975) cannot be left aside, who defines it as a "bridge" between educational principles and practice. For this reason, he suggests that educational activities be closely related to the curriculum to foster critical reflection that includes curricular proposals, educational theories, and practice. This would allow, as proposed in this research, to investigate the current contents of the curriculum in order to collect some elements that take into account the values, attitudes and priorities regarding the knowledge that has been outlined about educational processes. (Giraldo *et al.*, 2017).

This research, on the other hand, becomes relevant due to the alerts and recommendations made by some entities, such as Unesco (2021) or the OEI (2020). These organizations warn about the high level of desertion and the social inequalities that were evident during the pandemic in the most disadvantaged sectors. In the same way, Unicef (2020) ensures that the challenges that educational centers must face have to do with the path to follow in the design of processes that allow education with different dynamics, in a

complex context and full of uncertainty before the unexpected events caused by the covid-19 pandemic.

In this regard, Gervacio and Castillo (2021) refer to the importance of considering the school contexts, the socio-emotional state and the socioeconomic situation of the students before carrying out a planning of the curricular contents. In this way, consistency and objectivity can be achieved in the teaching and learning of students according to their experiential contexts. Therefore, it is essential that the curriculum of schools and other educational institutions reflect aspects of daily life and work in a specific society. This continues to be of paramount importance not only for educators, but for society as a whole.

Finally, after considering various perspectives of the curriculum, ranging from definitions to content and its application, it can be indicated that there is a consensus that it originates from the educational policies of a government, and is built as a sociocultural entity. This point of view is aligned with the ideas of Portela-Guarin et al. (2017), who point out that the curriculum acquires various meanings and values in each culture or set of pedagogical ideas, depending on their needs. In this context, Díaz-Barriga (2003) agrees that the application of curricular contents is related to methodologies, learning, teachers, researchers, programs, institutions and evaluation systems, as well as course planning, institutional work and systems. educational.

Therefore, the results of this research, far from being conclusive, are considered as a starting point and a motivation to continue exploring the updating, development and integration of relevant content in the curriculum. Therefore, it is pertinent to continue documenting the movements, guidelines and curricular strategies that will be implemented to address the enormous challenges that the covid-19 pandemic has posed to humanity.

Conclusions

The efforts aimed at maintaining education through virtual classes have generated consequences and tangible effects. In the case of this study, it is evident that the students failed to acquire the knowledge, learning, and academic skills necessary to face the global crisis caused by the pandemic in a resilient manner.

In this sense, the teacher's skills and competencies to interpret and adapt the curricular contents acquire great relevance, since the results reveal that the students perceived a lack of connection between the contents planned by the teachers and the challenges experienced at that moment.



On the other hand, it is undeniable that the school curriculum has undergone a limited level of updating and modification through the educational reforms, since the current approach in the upper secondary level tends to prioritize labor aspects over academic ones. Therefore, it would be pertinent to carry out an exhaustive and critical analysis by experts and academics on the subject in question to evaluate both the scope and the limitations of the current educational curriculum of the upper secondary level. This could generate proposals to promote a structural reform of a curriculum that is not only more coherent with the circumstances and challenges facing society as a whole, but also takes into account the cultural diversity that characterizes the country and its regions.

It is undeniable that the transformation of education must be focused on key areas that must be incorporated into the curriculum in a transversal manner and with emphasis on emerging issues that promote meaningful learning for students. For this reason, it must be taken into account that during times of crisis, socio-emotional aspects (such as resilience) become highly relevant.

Finally, the results obtained in this research provide essential information on the teaching-learning dynamics that prevailed at the upper secondary level of the Autonomous University of Guerrero during the health emergency. The various events triggered by the pandemic offered an opportunity for education in Mexico, and in particular the Autonomous University of Guerrero, to align the curriculum with the recommendations of international organizations. Which implies, of course, considering the principles of the 2030 agenda, which promotes educational projects that integrate curricular areas that promote the care of biodiversity, health and bioculturalism, as well as the generation of knowledge and awareness to build a future. sustainable.

Future lines of research

The data and methodology used in this research provide a solid foundation for exploring new studies in other educational subsystems. These new approaches could generate essential information to understand the methodological strategies required in the implementation of a new curriculum in upper secondary education in Mexico, as well as the challenges that arose in the teaching-learning process as a result of the pandemic.

In addition, this curricular theme offers various perspectives of analysis that could be explored. For example, it is suggested to investigate other areas from the perspective of curricular content, examining how teachers approached and adapted content during virtual

classes. It would also be relevant to analyze how the economic, social and environmental crisis was dealt with in formal education.

Likewise, additional lines of research are proposed from the perspective of the educational authorities in Mexico, including the Ministry of Public Education, as well as from the Autonomous University of Guerrero in relation to their study plans and programs.

Another valuable approach is to investigate teacher updating, that is, how teachers updated their methods during and after the pandemic. In this sense, it would be very useful to know how the teachers integrated the curricular contents with the demands of the health emergency. Undoubtedly, there are various areas and subjects within education, both locally and globally, that require greater attention and research in the future.

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