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ORIGINAL

Training projects, Virtual Education and Pandemic by COVID-19: from opportunity analysis to strategic decision making

Proyectos formativos, Educación Virtual y Pandemia por COVID-19: desde el análisis de oportunidades a la toma de decisiones estratégicas

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ABSTRACT

During the Covid-19 pandemic, higher education went from face-to-face to virtual for more than two years in Mexico. During this time, various strategies and approaches were tested, but the progress regarding the level of implementation in the training projects is unknown. That is why the purpose of this study was to determine the level of application of training projects in virtual education. The qualitative approach of documentary review was used as a methodology, observing 25 didactic plans, corresponding to the same number of university teachers. A socioformative analytical rubric was used, which allowed determining the level of performance, achievements and areas of opportunity. In this regard, it was found that the level of progress, in general, was between low and medium for the various indicators. The elements with the best advances in project work were: the identification of the curricular elements, the organization of activities in sequence and the formative evaluation, without reaching high levels. The worst addressed aspects, on the other hand, were: the organization of the students, the approach to a problem of the context and the resources. In future research, it is suggested to increase the sample and carry out extensive quantitative analyses.

Keywords: Training Projects; Sustainable Social Development; Socio-Training; Didactic Planning; Socio-Training Evaluation; Virtual Education; Health Sciences; Health Administration.

RESUMEN

Durante la pandemia de Covid-19, la educación superior pasó de ser presencial a virtual por más de dos años en México. Durante este tiempo se probaron diversas estrategias y enfoques, pero se desconoce el avance en cuanto al nivel de aplicación en los proyectos formativos. Es por ello que el propósito de este estudio fue determinar el nivel de aplicación de los proyectos formativos en la educación virtual. Se utilizó como metodología el enfoque cualitativo de revisión documental, observando 25 planes didácticos, correspondientes a igual número de docentes universitarios. Se utilizó una rúbrica analítica socioformativa, que permitió determinar el nivel de desempeño, logros y áreas de oportunidad. Al respecto, se encontró que el nivel de avance, en general, se ubicó entre bajo y medio para los diversos indicadores. Los elementos con mejores avances en el trabajo por proyectos fueron: la identificación de los elementos curriculares, la organización de actividades en secuencia y la evaluación formativa, sin alcanzar niveles altos. Los aspectos

peor abordados, por otro lado, fueron: la organización de los alumnos, el abordaje de un problema del contexto y los recursos. En futuras investigaciones, se sugiere aumentar la muestra y realizar análisis cuantitativos extensivos.

Palabras clave: Proyectos Formativos; Desarrollo Social Sostenible; Socioformación; Planificación Didáctica; Evaluación Socioformativa; Educación Virtual; Ciencias De La Salud; Administración En Salud.

INTRODUCTION

Online, virtual or e-learning education was not a novelty in higher education when the health emergency caused by the COVID-19 disease broke out, it was already being taught worldwide in some universities that, making use of Information and Communication Technologies (ICT), expanded their academic offerings to serve undergraduate and graduate students, This modality required the preparation of the teaching staff, the implementation of platforms that will allow self-regulation of learning and devices that will facilitate synchronous or asynchronous communication.[1]

In the Report "Education for All 2000-2015",[2] it was recommended that the countries of the world take hold of the use of ICTs and with them strengthen access to education; however, the diagnosis made was not certain how favorable it could be in the future, because teachers were not yet trained for this modality. This became evident worldwide when the measures of mandatory confinement were established, determining the mandatory nature of virtual education, both teachers and students who had not chosen this existing option and were accustomed to face-to-face classes had to adapt,[3] in this sense, recognizing successful experiences of some universities was a necessity for the academic community.

In the United States and Europe were places where the first universities were located that promoted virtual education favoring self-training,[4] however, Mexico could not be the exception, according to Navarrete-Cazales et al.[5] it was one of the pioneers, at the beginning of the XXI century the offer was increased in public and private universities, implementing classrooms was on par with educational policies promoted in this country, as it was in the National Development Plan 2013-2018 (PND, 2013); however, there were universities before the health emergencies that having facilities to access virtual classrooms were almost not used properly.[6]

During the health emergency, various strategies and approaches were tried in higher education to guide the teaching, learning and evaluation process with students, and one of the methodologies used in several universities was that of formative projects. The benefits of this methodology are: 1) they promote student participation in problem solving; 2) they increase interest in study, since they begin to assume it as a process of research and creation; 3) they help to understand the meaning of scientific knowledge; and 4) they strengthen the commitment to the community and the environment, and this leads to the formation of citizens who are oriented to achieve the common good.

The formative projects consist of an articulated set of activities to solve problems of the context (personal, family, social, environmental, technological, industrial, recreational, health, etc.), and thus achieve one or more training purposes established in the basic curriculum, through collaboration and based on complex thinking (CITAS). This methodology differs from problem-based learning in that, in the latter strategy, the focus of the work is on the analysis, understanding and explanation of the problem, not on its diagnosis and resolution in the real context.

The characteristics of formative projects are the following: 1) they are oriented to contribute to achieving sustainable social development within the framework of the integral and systemic development of communities; 2) they are based on the application of information and communication technologies based on the availability and access to these by students; 3) they promote the improvement of living conditions and environmental care based on the collaborative work of students in conjunction with other actors such as teachers, families and people in the community; and 4) they develop communicative and complex thinking skills.[7]

In the context of virtual education, it was also possible to create the conditions to develop training projects, taking into account that they are a pedagogical strategy which favor multiple actions such as teamwork and decision making,[8] likewise, "they are an opportunity to mobilize knowledge and develop the required competencies";[9] in addition, they represent a proposal for change to the way traditional teaching is carried out in universities, during virtual education it was necessary to test academic alternatives that would allow the development of curricular content, to set aside lectures and expository classes. In addition, it was also necessary to incorporate the use of ICT, making use of digital tools that helped to improve access to information and manage knowledge.[10]

In the implementation of training projects, the contributions of the socio-training approach[11] should be considered, which proposes:

Working with individuals, teams and communities to improve living conditions by solving problems through

inter- and transdisciplinary projects, based on the ethical life project, collaboration, co-creation of knowledge, complex thinking, metacognition and entrepreneurship.[12]

Therefore, the adaptations implemented during the virtuality required both teachers and students to make use of talent, understanding this precept as a complex process that helps to find solutions to difficulties,[13] it was necessary to continue with the professional training of graduate students by testing strategies that have been validated in the classroom.

In these experiences, it can be observed that the project methodology makes it possible to address the expected learning established in the basic curriculum, as well as the different contents (conceptual, procedural and attitudinal), although not in order, but according to the problem being considered. However, it is necessary to analyze the extent to which existing experiences address the essential axes of this methodology in order to identify areas of opportunity in the training of university teachers.

Therefore, the present study was oriented to achieve the following purposes: 1) to determine the degree of progress in the implementation of training projects in university programs under the virtual modality, during the COVID-19 pandemic; 2) to identify the achievements and areas of opportunity in the implementation of the project methodology; and 3) to provide specific recommendations to improve the implementation of training projects based on the self-evaluation and co-evaluation of the teachers themselves, as well as on the educational model of socio-training.

This research was considered relevant for the academic community because it will shed light on how training projects in higher education can be feasible both in face-to-face and virtual education; in addition, a concrete study was developed in the same context of the health emergency.

METODOLOGY

A documentary type of research was conducted, which allows exploring the existing information and systematizing it,[14] within the framework of the qualitative paradigm, which values the interpretation of the researcher.[15] This type of study consists of searching, reviewing and analyzing a series of documents with the support of some indicators or instruments, in order to answer a series of questions or contrast a hypothesis. The characteristics of this type of study are the following: 1) it is based on the review of documents, depending on the questions or hypotheses; 2) the documents are searched based on a series of criteria; and 3) the process is flexible, and during the study the questions or hypotheses can be changed according to the information that is found.

Rubric of formative projects. This instrument was created by CIFE and is intended to determine the level of implementation of formative projects at any educational level, taking as a basis the pedagogical model of socioformation.[16,17] The rubric is composed of eight indicators, which are the essential axes that a formative project should minimally include in its structure and execution with students. These axes are diagnosis of the group, training purposes, context problem, organization of activities, transversality, organization of students, socio-formative evaluation and resources for learning. Each indicator is evaluated through five performance levels taken from the socio-formative taxonomy: very low, low, medium, medium high and very high. The instrument was applied through a Google Forms form as each project proposed by the teachers was analyzed.

In the present research, experiences were sought at the University, in various undergraduate and graduate programs, during the initial phase of the COVID-19 pandemic, in the year 2020, in the virtual modality. In the end, 25 complete micro-curricula were selected, with their purposes, contents, methodology, evaluation proposal and resources. The main criterion used to make the selection was that the micro-curriculum should have some kind of progress in the implementation of the methodology of the formative projects, based on the socio-formative approach. A self-evaluation was made first by the teachers, and then a heteroevaluation was made by an expert researcher in formative projects. It is important to clarify that the level of coherence of the experiences evaluated in relation to the methodology of the projects was diverse, since in some cases the level was low and in others it was high.

RESULTS AND DISCUSSION

Table 1 shows a synthesis of the results obtained in the analysis of the micro-curricula during the COVID-19 pandemic, in the virtual modality, based on the self-evaluation of the same teacher and the hetero-evaluation of an expert in training projects.

Looking at how higher education developed during virtuality, the academic literature provided various interpretations of the adaptations made to the challenge posed by the context of the pandemic,[18] showed that self-regulation and self-management of knowledge in university students was important, in this line Díaz et al.[19] concluded that, despite the difficulties, teachers were able to meet the objectives formulated in their curricular plans due to the predisposition shown in adapting to new methodologies,[20] concluded that, despite the difficulties, teachers were able to meet the objectives formulated in their curricular plans due to the predisposition shown in adapting to the new methodologies,[21,22,23] in a study conducted on medical graduate

Table 1. Synthesis of the results obtained in the study

Indicators	Level achieved	Achievements	Aspects for improvement
1. Student diagnostics: At what level is the project based on student diagnostics?	Very low: 75 %. Low: 18 %. Medium: 7 %.	Although the level of achievement in the implementation of the diagnosis was, in general, low, the teachers express in their self-evaluation that this activity is very important and they hope to implement it little by little later on. A small progress was observed in the implementation of the diagnosis of the group. This may help motivate other teachers to implement this activity in the future.	In the future, teachers should be trained and supported in carrying out the diagnosis, so that the training projects that are implemented are more relevant to their needs and characteristics. Essentially, the diagnosis should identify the general characteristics of the students and analyze their previous knowledge.
2. Curricular elements: At what level does the selected project articulate with the curriculum, focusing on the achievement of one or more expected learning outcomes?	Medium: 88 %. High: 12 %.	The training projects analyzed are articulated with the approved curriculum and seek for students to achieve the training purposes established in the University's study programs.	Incorporate essential cross-cutting practices to achieve sustainable social development and community development, within the framework of the application of the socio-formative model.
3. Context problem and product At what level does the project aim to solve a problem in the environment and achieve a product focused on a challenge that satisfies a need?	Low: 61 %. Medium: 33 %. High: 6 %.	In most of the projects reviewed (39 %) a final product is established, but there is a lack of articulation with a problem of the context.	Addressing a problem of the context in 61 % of training projects. This requires a systematic training process because in the teachers' self-evaluation, most of them considered that they do work based on problems (when in fact they do not), because they confuse them with difficult questions or content.
4. Organization of the activities in a sequence: At what level are the learning, evaluation and management activities organized in a sequence and articulated with each other based on a central problem, with opening, development and closing activities?	Low: 31 %. Medium: 52 %. High: 17 %.	Most of the training projects have a didactic sequence consisting of three moments: opening, development and closing, and the activities are articulated among them.	Improve the articulation of activities in a project based on the approach to a problem of the context. Integrate more examples and processes for the search and appropriation of scientific knowledge.
5. Transversality: At what level is the knowledge of at least two different subjects, disciplines or areas articulated to analyze and contribute to solve the problem posed in the project planning?	Low: 87 %. Medium: 13 %.	Although the implementation of transversality in the projects was low (only 17 %), in the self-evaluation the teachers reported that this was a very relevant and essential topic in the integral formation of the students.	To train teachers in the understanding and implementation of transversality in projects, so that students can analyze and solve the problems of the context by articulating different knowledge and world views, within the framework of collaborative work among university professors.
6. Student organization: At what level is the organization of students for collaborative work planned?	Very low: 37 %. Low: 45 %. Medium: 18 %.	The organization of students was another area that was little addressed in the training project experiences reviewed. The teachers indicate in their self-evaluation that it is difficult for them to do this in the virtual education modality.	Train teachers in the various strategies they can implement to organize students for collaborative work and role-taking, using different technological resources. This can be done in the virtual modality

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7. Socio-formative evaluation: At what level is continuous and formative evaluation proposed in the project through a concrete product, the use of an instrument and collaboration?	Low: 33 %. Medium: 38 %. Medium high: 29 %.	In most of the training projects reviewed (67 %), elements of socio-formative evaluation are applied. This is a very relevant achievement because traditional content-based evaluation practices continue to prevail in universities.	Train and support teachers who are already practicing socio-formative evaluation so that they reach a high level in this process. With regard to teachers who have not initiated this methodology, show them examples and benefits of applying this evaluative approach, and then provide them with training and mentoring.
8. Resources. At what level are the resources for the realization of the learning and evaluation activities described, such as time, space and materials, according to the proposed activities?	Low: 56 %. Medium: 38 %. High: 6 %.	Forty-four percent of the training projects describe different types of resources to support students in their training. This is a very relevant achievement, because it is still very common to observe in university teaching those resources are only oriented to present a support bibliography.	Train and support 56 % of teachers to establish varied resources for the project that go beyond the traditional bibliography. Additional resources may include videos, podcasts, case studies, games, etc.

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students, described that in this modality students wish to strengthen continuous training and are predisposed to innovation in such sense the appearance of Covid-19 was not an obstacle, in addition, academic continuity implied mental and psychological attitudes of coping;[24,25,26,27] likewise, they had to be resilient in the face of the not very encouraging news and the changes they faced in the new teaching modality;[28,29,30] consequently, many depended on the strategies implemented to allow adaptation, in this sense, the development of formative projects was an alternative to involve students in their learning, being able to solve problems, work collaboratively, although according to the information processed in graduate students at the ICEL university, the percentages were mostly in the medium and low levels.[31,32,33]

CONCLUSIONS

The experiences of implementation of the formative projects show a varied panorama in higher education, in the online modality and during the COVID-19 pandemic, since there are cases with excellent achievements in the application of the methodology, and, in other cases, the level of progress is still low. However, in general, teachers commented in their self-evaluations the need to train and improve the implementation of this strategy because they find benefits for the integral formation of students.

The main achievements or progress found were with respect to 1) the curricular elements addressed, which consists of the articulation of the training projects with the training purposes and the guidelines of the study plans and programs; 2) the organization of activities in a sequence, based on a problem or challenge; and 3) the socio-training evaluation, which consists of providing feedback and support to students so that they achieve the training purposes established in the curriculum, based on collaborative work with peers, other teachers and the community.

Regarding aspects to improve, the following stand out: 1) the diagnosis of the group, which very few teachers carry out, and which is essential for students to be motivated in the process; 2) the approach to a problem of the context, which is necessary for the projects to really have an impact; 3) the organization of students within the framework of collaborative work; and 4) the resources for training, which cannot be limited to the description of the bibliography.

It is suggested to implement training and support processes for teachers in the methodology of training projects to continue the process of transformation and innovation of university teaching, which should be accompanied by concrete examples that have been carried out in virtual mode, and collaborative work among teachers.

For future studies, it is recommended that the sample be expanded to include other universities in the same country and in other countries, and that a qualitative and quantitative methodology be used to reach more specific conclusions. It is also suggested to evaluate the implementation in the classroom with students with the support of other types of instruments.

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