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The NOOCs as a training strategy for teachers in the use of technological tools in primary education

Los NOOC como estrategia de capacitación docente para el uso de herramientas tecnológicas en educación primaria

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ABSTRACT

Since their inception, Nano Massive Open Courses (NOOC) have been considered an alternative for the continuous training of teaching skills. Within the framework of an IB certification process, the primary education section of a private school in the city of Querétaro identified the need to train its teachers in the use of the Toddle App tool. The study was carried out from the methodological framework of action research, so three courses in NOOC format were designed and launched as a training strategy. The first stage of the investigation consisted of data collection through a questionnaire via Google Forms to obtain relevant information about the teachers' perception of the technological tool and in relation to the thematic areas of the training strategy. In the second stage, three NOOCs were designed and implemented. The final stage consisted of applying a questionnaire to obtain feedback data on the training strategy. The most relevant results suggest that most teachers consider the training modality to be adequate and sufficient. Furthermore, teachers consider the guide of an expert necessary to use the tool and affirm to have conceptual deficiencies about the different sections of the platform.

Keywords: informational literacy; educational management; educational computing; information technology.

JEL Classification: I21; I29.

RESUMEN

Desde su aparición, los Nano Curso Masivo Abierto (NOOC) han sido considerados como una alternativa para la formación continua de competencias docentes. En el marco de un proceso de certificación IB, la sección de educación primaria de un colegio privado en la ciudad de Querétaro identificó la necesidad de capacitar a sus docentes para el manejo de la herramienta Toddle App. El estudio se ejecutó a partir del marco metodológico de la investigación-acción, por lo que fueron diseñados y puestos en marcha tres cursos en formato NOOC como estrategia de capacitación. La primera etapa de la investigación consistió en la recolección de datos mediante un cuestionario a través de Google Forms para obtener información relevante sobre la percepción de los docentes respecto a la herramienta tecnológica y en relación las áreas temáticas de la estrategia de capacitación. En la segunda etapa, se diseñaron e implementaron tres NOOC. La etapa final consistió en la aplicación de un cuestionario para obtener datos de retroalimentación sobre la estrategia de capacitación. Los resultados más relevantes apuntan a que la mayoría de los docentes consideran la modalidad de capacitación como adecuada y suficiente. Además, los docentes consideran necesario la guía de un experto para utilizar la herramienta y afirman tener carencias conceptuales sobre las diferentes secciones de la plataforma.

Palabras clave: alfabetización informacional; gestión educacional; informática educativa; tecnología de la información.

Clasificación JEL: I21; I29.

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INTRODUCTION

Nowadays, projects involving virtual learning environments in educational centers working in face-to-face mode are increasingly recurrent (Singh et al., 2021). Since the pandemic, the education sector has sought to support its work with technological tools in order to be prepared to "move" to virtuality when required (Lemay et al., 2021; Maimaiti et

al., 2021; Turnbull et al., 2021; Yunus et al., 2023). In this regard, educational centers have invested resources in training teachers in using virtual teaching-learning tools. While the pandemic tested teachers and demonstrated a rapid adaptation to virtual distance work, training gaps in virtual education were also evident, especially for the implementation of blended models (Bruggeman et al., 2021; Castro, 2019; Rasheed et al., 2020; Singh et al., 2021).

This research is oriented to the training of teachers to manage a virtual learning environment through NOOC in an elementary school in the city of Querétaro. The tool intended to be socialized among teachers is essential for collaborative work and the development of didactic planning oriented to the principles of the IB (International Bachelor) program implemented by the school. This research aims to develop and implement the NOOC as a teacher training tool for using the Toddle App.

Some theoretical considerations

Sangrà et al. (2015) identified the origin of Massive Open Online Courses (MOOC) in Canada in 2008. However, there is evidence of the work done by TESOL International in coordinating massive open courses to train language teachers in new technologies (Ossiannilsson & Altinay, 2015). Different authors point out that the formats and presentation of massive open courses have evolved (Hammershøj, 2019; Mohan et al., 2020). From regulated and certified training, there is a movement toward more open trends in education and training, with greater emphasis on the emotional, behavioral, and holistic developmental aspects of users (Al-Rahmi et al., 2019; Perez et al., 2022; Zhao et al., 2022).

This type of course has recently taken place internationally in universities (Al-Adwan, 2020; Altalhi, 2020; Fidalgo-Blanco et al., 2016). Several factors have favored the described trend (Al-Rahmi et al., 2019). On the one hand, there is widespread access to the Internet from any device, which expands the possibilities of exploitation. In addition, there is a decrease in costs due to the flexibility and virtual modality of the courses, which consolidates MOOCs as a great tool for online learning (Palacios et al., 2020). Therefore, numerous platforms have been developed that seek to meet the different needs of educational institutions, such as usability, number of users, training objectives, format, and administrative tasks, among others (Altalhi, 2020).

In the last decade, a new format of open courses with shorter training time and greater flexibility has appeared. The objective is to solve one of MOOCs' major limitations: high dropout rates. While MOOCs were designed for a training time of between 10 and 60 hours, NOOCs (Nano et al.) are designed for a range of 3 to 20 training hours, which enables professional training in specific knowledge and skills throughout life (Palacios et al., 2020).

There is a large and solid literature on MOOCs and indications of increased acceptance (Al-Rahmi et al., 2021). On the other hand, few empirical studies on MOOCs offer results on their operation and effectiveness (Palacios et al., 2020). The first mentions of NOOCs appear in the taxonomy proposed by Clark as micro-NOOCs (Suter & Lüthi, 2021). What is sought with these new formats is to have efficient training from any place and at any time. One of the most relevant works is the research of Pérez et al. (2017), who describes the implementation of nine nano-courses (NOOC) to improve the training of university teachers in digital competencies. One of the elements highlighted in the project is implementing a self-assessment test that allows participants to know their level of management (basic, intermediate, and advanced) in each competency.

From the results of the self-assessment test, students are informed to make an autonomous and conscious decision about the level at which they wish to enroll in each of the NOOCs. Thus, the learning path for each student is completely personalized. The NOOCs are designed for 5 hours of training; after each level, students receive an accreditation, and at the end of the course, they must submit a test of valid knowledge and skills sufficient to be certified in the area of competence.

For their part, Carvalho Da Silva et al. (2019) published the results of a quantitative comparative study in a public education institution, which aims to answer whether shorter courses have a better completion rate. For this purpose, they took as a sample a group of students who took two sets of courses: one designed with traditional methodology and the other following the NOOC model. After applying the courses and the Student's T-test, the authors concluded that the completion rate of the MOOCs was higher than the traditional courses. Also, they point out that while in the traditional courses, students dropped out as the complexity of the topics covered increased, in the NOOCs, no trend related to the level of difficulty and the dropout rate of the courses is identified (Carvalho da Silva et al., 2019).

In 2022, Basantes-Andrade et al. (2022) investigated to answer the question, "Do courses in nano-MOOC format

contribute to improving teachers' digital competencies? For this purpose, they conducted descriptive-inferential comparative quasi-experimental research at the Universidad Técnica del Norte. Five courses were developed using the Moodle platform, ABNOOC to cover the two areas of competence in which the participants showed the greatest limitations.

The most important contribution of the work is its contribution of solid, scientific, and academic evidence to demonstrate that nano-MOOCs contribute to the continuous development of teachers' digital competencies. The authors state that their results cannot be extrapolated for teacher training since the characteristics of the teachers, the context and their level of digital competence about several variables must be considered in order to achieve a training proposal that meets the requirements and needs of university faculty (Basantes-Andrade et al., 2022).

METHODS

The present research is framed within the mixed paradigm, with a predominantly qualitative nested design, as a more complete analysis of the phenomenon in question is pursued (Johnson & Christensen, 2019). This particular route is followed to understand and deepen the perspective that human beings construct on the phenomena of reality (Hernández & Mendoza, 2018). This methodological decision was made because the construction of the teacher training model has as its starting point the teachers' perceptions about the use of ICT in teaching and their experiences.

The qualitative methodological design followed is that of action research. For Merriam and Tisdell (2016), this approach is relevant when the objective is to solve practice problems or develop interventions to understand certain actions in specific contexts. For the present research, McNiff and Whitehead's (2016) proposal, which contemplates the phases of observation, reflection, action, and evaluation, is taken up again.

The research population consisted of 52 teachers from the elementary section of the John F. Kennedy American School of Querétaro. The group of teachers comprised 16 regular English teachers, nine regular Spanish teachers, 12 co-teachers, nine special classes teachers, three physical education teachers, two substitute teachers, and one English reading specialist.

The first stage of this research consisted of a diagnosis of the context. This was done through participant observation and data collection through a Google Forms questionnaire. With this, information was obtained about the school's technological infrastructure, the frequency of use of the Toddle App platform by teachers, the advantages they consider to have or not, the use of this technological tool, and their perception of it.

Based on the results obtained, the topics for the three NOOC training courses were selected: 1) Creation of learning experiences, 2) Planning a thematic unit, and 3) Implementation of the thematic unit. Each NOOC has three lessons: an interactive video explaining how an element of the tool works, an optional practice exercise, and an optional self-reflection activity on the teacher's use of that function of the Toddle App platform. Each course has a load of 2.5 hours of work. However, it may vary according to the training of each teacher.

The decision to make the deliverables optional so that the NOOCs would not represent a greater administrative burden for teachers. In the initial survey, 80% of the teachers stated that using Toddle requires more planning time. Thus, in the opinion of the researcher and the leadership team, giving teachers flexibility in terms of NOOC deliverables was essential so that this would not result in low participation in the training courses.

On the other hand, teachers also had the agency to choose the course or courses they preferred and felt would help them improve their Toddle App management skills. Once the teachers had completed the training course, they were asked to answer a questionnaire to provide feedback on the courses.

RESULTS

Characterization of the context and main results of the diagnosis

In the knowledge society, digital technologies have become the main means of communication, information and knowledge exchange, research, production, organization, and administration (Drucker, 2012). Moreover, within this new social paradigm, information and knowledge become valuable resources (Islas, 2017), so educational systems are being restructured to incorporate technological tools to train individuals capable of accessing information and producing new knowledge.

So, educational institutions have directed their efforts to incorporate ICT as a support tool in pursuing their training objectives. The "JFK American School of Queretaro" is part of the described trend since it has multiple national and international certifications that endorse all the teaching-learning processes in the institution. Within the framework of the use of ICT in educational processes, they have the following certifications: Cognia, ISTE (International Society for Technology in Education), and IB (International Bachelor).

The IB accreditation is one of the most important of the institution; since 1997, with the authorization to teach the Diploma Programme, they have worked on getting the different certifications for their teaching programs and being able to consolidate as an IB World School. In 2016, they received approval to implement the MYP (Middle Years Program), and three years later, they were granted the license to implement the PYP (Primary Years Program), becoming one of the few schools worldwide to offer the IB Program Continuum.

Following the line of thought of those authors who affirm that technology permeates all spheres of life today, the attributes of the IB are connected to the use of technological tools to achieve the formation of people who are aware and responsible for the world they inhabit. The IB certification process has different stages. Currently, the JFK American School of Queretaro" receives a visit every five years to ensure that the IB Standards and applications are being carried out properly and that the school has improved its implementation, considering the recommendations made in previous visits.

The visit considered different stages. In November 2021, over 200 documents from the three programs (PYP, MYP, and Diploma Program) were sent to the IB. The documents were first reviewed by readers appointed by the IB, who perform a preliminary review, and later by the visiting delegation to begin to know, through the written documents, what is done in the school and how it is done.

In February 2022, the report containing the school's self-evaluation concerning all its Standards and Applications was sent to the IB with the participation of all academic staff, a sample of students, and parents for each program. Based on the results of this self-assessment, the school designed a development plan that was also submitted to the IB, and implementation began. As part of the results of the self-evaluation exercise, it was determined that the teachers of the elementary section should have used the technological tool for planning learning experiences, in violation of the leadership team's expectations.

The technological planning tool used by the school is called the Toddle App, a platform designed to plan the different IB programs. It has tools for curricular planning, teaching and learning, evaluations and reports, and the administration of all the tools. Teachers' use of the Toddle App was fundamental for the educational institution since the curriculum planning information was concentrated in the platform's formats, and the IB committee reviewed this information. So, recognizing the shortcomings in using the platform, the need arose to identify the causes of the problem and develop a solution for it.

The teachers have had access to this platform for four years; however, it was determined that, despite its central function as a planning tool, more than 80% of the teachers did not use it as a planning tool but limited themselves to filling out the information requested at the end of each learning unit. In addition, all the teaching staff stated that training is necessary to use the tool.

Expression of teacher representation by means of the questionnaire

The most important results obtained through the data collection instruments described above are below. Regarding the teachers' perception of the contribution of the courses to their professional development, more than 50% of the teachers agreed, as described in *table 1*.

Teachers were asked to self-assess their knowledge and management of the different tools at the end of the NOOCs. The scale used is the same as the one used at school to define an individual's learning stage. This scale is from 1 to 4, with 1 being the apprentice stage and 4 being the expert stage. The results indicate that most teachers perceive themselves to be in the process of acquiring knowledge about the different Toddle App functions. The results are consolidated in *Table 2*.

Table 1.
Importance of courses for professional development

Scale/Coure	Course 1	Course 2	Course 3
1	18.18%	18.18%	41.67%
2	63.64%	72.73%	58.33%
3	18.18%	9.09%	0.00%
4	0.00%	0.00%	0.00%
5	0.00%	0.00%	0.00%

Note: The scales are distributed as follows: 1 I completely agree 2 I agree 3 I neither agree nor disagree 4 I disagree 5 I completely disagree.
Source: Own elaboration.

Table 2.
Level of preparedness for the tools reviewed

Cat	*Course 1*	*Course 2*	*Course 3*
1	0.00%	27.27%	0%
2	45.45%	45.45%	50%
3	54.55%	27.27%	50%
4	0.00%	0.00%	0%

Note: Scale categories: 1 I am an expert: I can teach others; 2 I am a master: I understand the concept and can demonstrate it; 3 I am a learner: I partially understand the concept; 4 I am a novice: I do not understand... yet. I need help
Source: Own elaboration.

Regarding what teachers consider to be at the expert level in using Toddle's functions, it was found that teachers say they need more opportunities to practice using the platform's functions. They also indicated, in the case of the trainees, that they would like an expert to guide them in completing the different sections of the planner. In addition, it appeared as a generality that teachers claimed to have conceptual deficiencies about the different sections of the platform, giving rise to a new thematic line of training.

Regarding whether they consider the training modality adequate, 68% of the teachers answered in the affirmative. Thus, this modality can be considered for future occasions based on the results and experiences consolidated in this study. The remaining percentage indicated that it is necessary to complement the online training with a face-to-face course, which has been contrasted in the literature as a need and possible demand (Castro, 2019; Rasheed et al., 2020; Singh et al., 2021).

Teachers in different spaces valued the results achieved by implementing the experience. Most of them considered that the NOOCs contributed to better management and knowledge of the platform, although they stated that they were still consolidating their learning. The teachers proposed to get the help of an expert to get to know the platform in depth. From this, the monitoring process during the courses needs to be improved, and it is necessary to restructure the follow-up during the courses.

Among the factors pointed out as possible improvements, 67% of the responses pointed out that the teachers' leadership team should address the transformations and not the trainers. Some of the suggestions were to establish a single planning tool, define a specific time to use Toddle, reduce the administrative burden on teachers, and establish clear expectations about the use of Toddle.

Recommendations for future training courses include compiling resources (videos, infographics, and formats) in a Drive folder, deepening the concepts of the planner, and including practical advice from other teachers. Therefore, it was appreciated that teacher participation in the evaluation of the courses constitutes an opportunity to improve the NOOCs as a tool for their training.

CONCLUSIONS

In times of new normalities, ICTs are a fundamental tool to guarantee the continuity of education. The study revealed the importance of NOOCs for teacher training and improvement, especially if they can be combined with face-to-face forms in a mixed model adapted to the particular educational context. The information gathered concluded that most teachers consider that the NOOCs contributed to better management and knowledge of the platform. However, they state that they are still in the process of consolidating such learning.

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