

Analysis of higher education teachers' messages in a virtual forum about learning models

Análisis de los mensajes de docentes de educación superior en un foro virtual, sobre Modelos de aprendizaje

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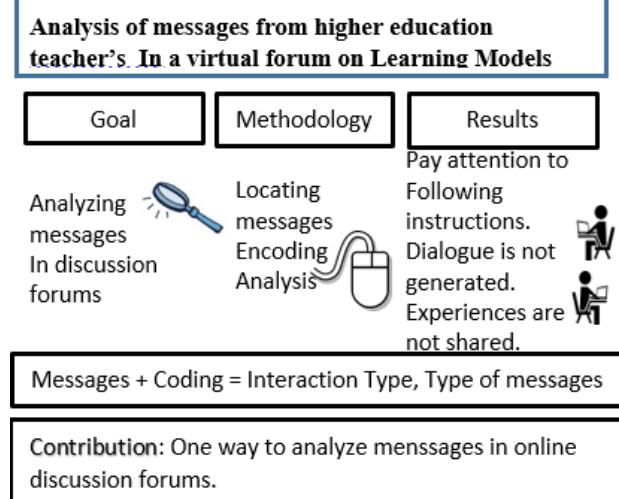
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Abstract

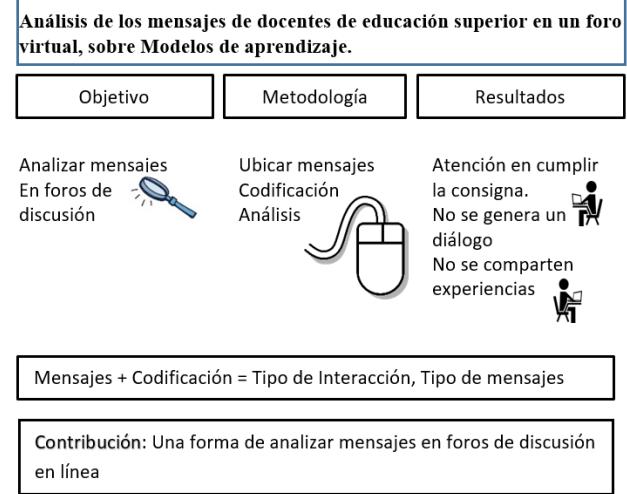
This paper presents an analysis of messages posted in a self-directed online course aimed at teachers at a public university. The objective was to analyze messages from higher education teachers in a virtual forum about learning models. A mixed approach was used, and the method applied was the sequential exploratory method proposed by Creswell & Creswell (2023). In the qualitative part, content analysis with a category system was used, and in the quantitative part, descriptive statistics were used. The instruments were frequency concentration tables, and 79 teachers participated, generating a total of 125 messages. The platform instructions asked participants to comment on the topic and respond to another participant's comment. The contribution is as follows: methodologically, a way to analyze messages in online discussion forums and content; the importance of instructional design in online courses to achieve interactions with analytical or propositional content.

Resumen

Se presenta el análisis de los mensajes publicados en un curso autogestivo en línea, dirigido a docentes de una universidad pública. El objetivo fue analizar los mensajes de docentes de educación superior en un foro virtual, sobre Modelos de aprendizaje. Se trabajó un enfoque mixto, en la parte cualitativa se utilizó el análisis de contenido con un sistema de categorías y en la cuantitativa estadística descriptiva. Los instrumentos fueron cuadros concentradores de frecuencias, participaron 79 docentes que generaron un total de 125 mensajes. La consigna en plataforma solicitaba comentar sobre el tema y responder al comentario de otro participante. Como aportación se tiene: metodológicamente una forma de analizar los mensajes en los foros de discusión en línea; de contenido, la importancia del diseño instruccional en cursos en línea para lograr interacciones con contenido analítico o propositivo.



Teacher Participation, Virtual Environments, Higher Education



Participación docente, Entornos virtuales, Educación superior

Area: Promotion of frontier research and basic science in all fields of knowledge

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Introduction

In recent years, virtual learning environments have been widely accepted as key spaces for teacher training and professional development, especially in higher education institutions, since, according to Reyes-Angona et al. (2023), 'offer a flexible solution to teachers' busy schedules, facilitate locally unavailable knowledge, structure their training path, and provide environments for asynchronous communication between colleagues' (p. 12). For their part, Pérez et al. (2025), mention that 'digital devices have changed the way access to information is perceived, especially in the field of education, which has generated great interest as a subject of study in the last decade' (p. 3).

The expansion of online modalities has driven the use of new forms of pedagogical support, strategies that promote active participation, collaboration, and critical reflection among participants, as well as achieving experiential learning experiences that can be extrapolated to classrooms with students. According to Eusebio (2023), this educational modality 'offers an educational opportunity to those who missed out on it at the time, have more problems accessing more rigid school schedules, or are located in geographical areas far from the centres or institutions where it is taught' (p. 36). According to Rojas, et al. (2014), 'Virtual training platforms, if good practices are implemented, increase students' motivation to participate in activities' (p.239).

For their part, Alcivar et al. (2022) refer to learning activities in virtual environments as enriching experiences that, in addition to providing information, promote the training of active students who construct their learning by taking advantage of interactions with others. However, the transition from traditional models to more participatory approaches in virtual environments is not automatic; it is necessary to understand how teachers interact in these spaces, what kind of discourse they construct, and how deeply they engage with the proposed content.

Learning management platforms allow the creation of virtual classrooms and offer opportunities to observe these dynamics through the messages that participants post in forums or comment sections, as it is in this space where the social construction of knowledge takes place.

The interaction and dialogue achieved through the messages that are posted reflect the collective processes of learning generation.

Currently, given the recognition of the benefits of pedagogical resources designed in virtual learning platforms, studying the posts made by participants and the interaction achieved despite the limitations of distance and time generates reflections on educational practice and course design in virtual environments. This document proposes a way of studying the messages posted in forums based on previously designed categories and the type of interaction that takes place in the development of a self-managed course in virtual environments, providing evidence of the elements necessary in instructional design to achieve efficient communication among participants, as well as the achievement of the objectives set.

The article is structured around the context in which the study was conducted; the problem being investigated, the objective to be achieved and a brief theoretical basis; the methodology, the results and their analysis.

Context

The study presented here was developed in the context of a continuing education course offered in a virtual learning environment by a public university to its teaching staff, with the aim of raising awareness among its academics of the importance of knowing and using technologies to develop new teaching models and introduce concepts related to active and adaptive learning.

The course lasted six weeks, was self-directed, was offered openly, and different groups were organised according to the affiliation of the applicants in the different centres of the university.

The course design included four major themes marked as chapters: (1) Most common learning models today, (2) Evolution of traditional teaching models, (3) Adaptive learning, (4) Innovative models. It was offered on Google Classroom, a platform that facilitates online learning management and, according to Herrera et al. (2025), 'is a learning management system (LMS) that allows you to create virtual classrooms, share materials, assess learning, and establish asynchronous and synchronous communication between teachers and students' (p. 2).

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The methodology required participation in presentations via ZOOM by the course leader; review of reading materials and videos as a basis for answering reflection questions, the answers to which were recorded on the platform; and two final products.

The platform also had a Comments section (discussion forum) for each topic, with the instruction: 'Please comment on this chapter and respond to a comment from another person.' This section facilitated asynchronous interaction between participants, which supported learning and the social construction of knowledge.

The course under study had an introductory focus and centred on active and adaptive learning in different educational settings (online, hybrid, and without technology). The first chapter, entitled 'Most common learning models today,' covered the following topics: 1) Traditional face-to-face education model. 2) The Elite University Model. 3) Distance education model. and 4) Hybrid teaching models.

Problem

When working with self-directed online courses, the instructional design must support learning and participant interaction, since there is no advisor to provide feedback on comments and contributions, and the participant assumes this role.

If the instructions provided by the instructional design are not clear, comments are made in the forums, but not always reflections, discussions or exchanges of experiences. As a result of the above, it is interesting to study what interaction and what type of messages are posted based on a very general instruction in the virtual discussion forum of a self-directed course, on the topic of Learning Models, which is being worked on by university teachers.

The objective

Based on previously defined categories and taking into account only the first chapter of a self-directed course, the following objective is proposed: To analyse the messages of higher education teachers posted in a virtual forum on Learning Models.

Theoretical basis

Online discussion forums. - A tool that should be given importance in the platforms used to administer online courses are the so-called discussion forums, located in some platforms as a space for comments. According to [Reyes-Angona et al. \(2023\)](#), 'discussion forums need a pedagogical design that promotes the social construction of learning' (p.13). [Eusebio \(2023\)](#) states that these tools 'foster scenarios of asynchronous interaction, so that users can leave their messages at any time to be read at a different time' (p. 37).

Depending on the function assigned to the forum in the design, there are different types, including presentation forums, socialisation forums and forums that serve as a true space for learning construction, since, according to the advisor's instructions, participants delve deeper, analyse, make judgements or confront their peers' ideas until they arrive at products such as conclusions, outlines or summaries of the topics under study. 'The communicational quality of the platform is evident if it allows both asynchronous and synchronous interaction in two areas: teacher and student and among students.' ([Eusebio. 2023, p.37](#))

[Martínez, et al., \(2024\)](#), state that 'The purpose of discussion forums is to stimulate debate without exhausting the content being discussed' (p.165). In these written conversations, participants post and comment on messages, creating discussion threads. 'Discussion forums symbolise the virtual exchange of ideas, opinions and information, in which participants can express their agreement or disagreement with regard to a particular topic' (p. 166).

Interaction in virtual learning environments

Interaction in so-called online forums has evolved towards more complex forms of social knowledge construction. According to [García-Vargas et al. \(2022\)](#), asynchronous discussion allows for more reflective learning, so it is not just about information exchange, but also becomes a space for the development of metacognitive skills. For their part, [López et al. \(2022\)](#) state that 'facilitating the search and selection of information in forums and offering notices or recommendations on publications of interest could help to interact more frequently' (p. 75).

Muñoz-Basols and Fuentes (2024), citing Moore (1989,1), suggest that interaction ‘consists of three main types: 1) learner ↔ teacher, 2) learner ↔ learner, and 3) learner → content or materials’ (p. 188). These authors point out that interaction can be conditioned by factors such as: the teaching context, the environment or medium, the subject matter, the curriculum design, and the cultural component. (p.189)

When discussing interactions in virtual environments, it is important to pay attention to the content of the exchanges, which must address the teacher's presence, both cognitive and social.

Palomino and Ramírez (2010), citing Garrison et al. (200), define cognitive presence as ‘the degree to which participants are able to construct meaning from sustained communication’ and mention that teaching presence ‘includes educational design and the facilitation of learning processes, in which the teacher contributes their expertise on the subject and facilitates active learning’ (p. 81). For his part, Jerónimo (2009), cited by **Palomino and Ramírez (2010)**, ‘defines social presence as the ability of beginners to project themselves socially and emotionally into a community of inquiry’ (p. 81).

Methodology

The course participants were a group of 134 teachers from a public university in Mexico, from one of the institution's University Centres, teachers with experience and training in the field of face-to-face teaching. In chapter 1 of the course, out of a total of 134 participants, 79 participated, generating a total of 125 messages, with different schedules and rhythms. The content of the analysis presented will be the messages posted by these 79 teachers during the time allocated for the work of the first chapter of the course.

A mixed research approach was used. According to Creswell and Creswell (2023), with this type of approach, a complete understanding of a research problem is developed by combining quantitative and qualitative results, quantitative data is explained in more detail with qualitative results, and a comprehensive understanding is developed to analyse groups through the combination of qualitative and quantitative data.

The qualitative aspect involves the collection and analysis of messages, which identifies the indicators to be worked on, while the quantitative aspect involves coding and counting the appearance of these codes in the published messages.

The study was exploratory and descriptive in nature and was based on the analysis of the messages posted by participants in the first chapter of the course.

The sequential exploratory method proposed by Creswell and Creswell (2023) was applied. These authors stated that it consists of a three-phase design (see Fig. 1): in the first phase, qualitative data are collected and analysed; in the second phase, the characteristics of the analysed data are identified; and, based on the results of these data, quantitative data are collected and analysed.

Box 1

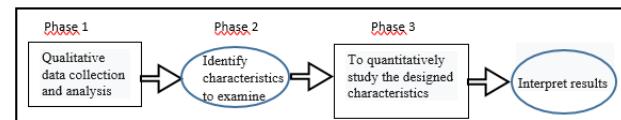


Figure 1

Explanatory sequential method

Source: Own Elaboration

To collect and analyse qualitative data, content analysis was used, a research technique that determines the frequency of indicators or keywords, uses coding, counting and interpretation, and interprets and quantifies textual data. A descriptive analysis using basic statistics was used to analyse the quantitative data. Content analysis can be manifest and latent; in the manifest analysis, statistics are sought, and the latent analysis allows for the categorisation of data patterns that provide material for the researcher to seek meaning in a specific context (**Lázaro, 2021**). In the study presented here, both types were applied, as there are percentages and explanations that allowed for the coding of the participants' intentions and not just their words.

A system of categories was designed for the analysis of the messages. This included the construction of indicators, operational definitions, and codes, which allowed the messages to be classified according to their content and level of interaction (see Table 1).

These indicators were constructed based on the reading of the published comments. Not all course participants posted messages, and some of these contain two or more of the indicators being studied.

Box 2

Table 1

Indicators, definition and codes for analysis

Indicator	Operational definition	Code
Interaction with others	They agree, add to ideas, comment on others' messages, greet others, and direct messages.	IC
General overview of the content	They mention something about the topic addressed.	GC
Position on models	They take a stance, either accepting or rejecting the models.	PM
Reflections on models	They raise challenges, requirements, and successes of the models being reviewed.	RM
Share your practice	They discuss their practice and experience.	CP

Source: Own Elaboration

Results

As already mentioned, the messages posted in the comments section of Chapter 1) "Most common learning models today" of an introductory course that encouraged reflection and dialogue were analysed. The instruction on the board was: "Please comment on this chapter and reply to someone else's comment." The 79 teachers who participated in this chapter, as already mentioned, generated 125 messages.

Of the 79 participating teachers, 53 responded to the prompt on the platform by posting ideas about what was reviewed in the chapter (RC), and 26 did not (No RC); 38 received and sent messages (RyE), 11 responded to the prompt but did not send messages to their peers (R No E), and 26 sent messages but did not respond to the prompt (E No R) (see Figure 2).

Box 3

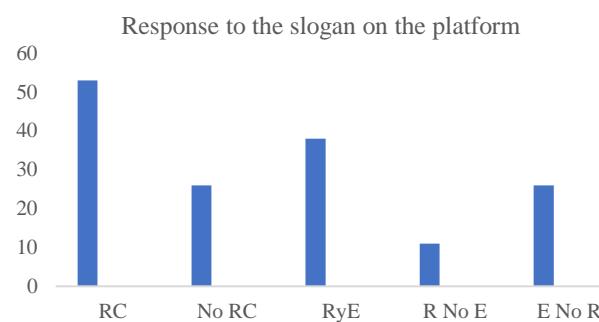


Figure 2

Participation of teachers responding to the prompt and sending messages to classmates

Regarding the messages posted: 64 of the participants send messages to a classmate, 38 comment on another classmate's message, 31 send and comment on messages, 23 of the messages sent are addressed to someone in particular, giving a social presence to the classmate to whom the message is addressed, 3 are addressed to EVERYONE, no participant signs their message, which indicates that the sender of the message does not show a social presence in the interaction (see Figure 3).

Box 4

Addressing messages

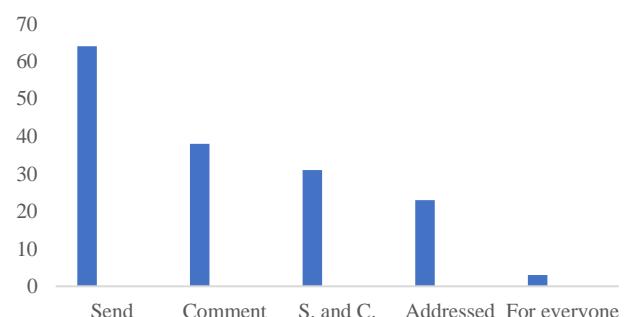


Figure 3

Sending messages

The messages were coded according to established codes. It should be noted that the published messages could present several indicators. Analysing the published messages and considering the general distribution of participation, it was found that in the first chapter of the course, there were interactions in 73 messages, taking this interaction to mean commenting on another, agreeing, comparing or giving a point of view on what was published, which is the highest indicator.

In 21 messages, phrases were found about the general content of the course, mentioning topics covered, which suggests that few paid attention to the general ideas of the content. In 39 messages, ideas were found that reflect the position taken on the models reviewed, showing that almost half of the participating teachers expressed a critical or accepting position on these models. In 34 messages, reflections on these models were made, showing a deeper level of thinking, and in 18 messages, participants' teaching experiences were published, showing that some participants linked their learning to their teaching experience.

Table 2 shows the frequency of indicators obtained in the messages posted in the first chapter of the course.

Box 5

Table 2

Frequency of indicators

Indicator	Code	Frequency of indicators
Interaction with others	IC	73
General content overview	GC	21
Approach to models	PM	39
Reflections on models	RM	34
Sharing your practice	CP	18
Indicator	Code	Frequency of indicators
Interaction with others	IC	73
General content overview	GC	21
Approach to models	PM	39
Reflections on models	RM	34
Sharing your practice	CP	18

Source: Own Elaboration

Analysis and discussion

The study, conducted in the context of a self-directed online teacher training course, focused on the interaction achieved by its participants and the type of messages they posted in Chapter 1 of the course. It is accepted that new technologies enhance virtual learning environments through access to information, interaction between participants, and the learning that is achieved. The literature suggests that self-directed learning prioritises interaction between students and content.

In the study presented here, the instructions given for the work in the comments section were: 'Please comment on this chapter and reply to another person's comment.' In response to this instruction, only 67% posted a comment on the chapter. Of these, 38% not only posted a comment about the course but also sent a message to one of their classmates.

According to Martínez et al. (2024), the purpose of discussion forums is to stimulate debate. Although there is interaction in the course under study, it is minimal, as most comments are directed at a single participant without starting a chain of comments or a discussion thread. Interaction is only found in more than one message in the thread of 20 conversations. This low participation can be attributed to the generality of the assignment, which did not include clear guidelines to guide the discussion. This may have influenced the lack of depth in the topics addressed, as commenting on a classmate fulfilled the assignment, which was a limitation in the instructional design.

With regard to the indicators detected, according to the depth of the interventions, Interaction with others (IC) and Generalities of content (GC) address the most basic aspects. Twenty-one phrases on generalities of content were found, reflecting that some messages reproduced general ideas that caught the attention of the participating teachers. Of the messages sent, 38 of them interacted with a colleague by commenting on their message, agreeing with or reinforcing the idea posted with phrases such as '...I agree with you that the hybrid model can provide interesting tools for our students,' '...you are absolutely right, the circumstances of this new stage led us to start giving these blended classes...,' 'As you rightly say, Dr., digital skills were not the main reason for not continuing the course online.'

Although 64 teachers sent messages, not all of them received comments from other colleagues to continue the discussion chain. For example, messages such as 'What activities would you like to include in the virtual context that you have not done in a face-to-face environment?' or 'Returning to your comment, Professor... what is your suggestion regarding how to be a mentor, guide, and motivator and not repeat your class every semester?' were posted and did not receive responses; there was no interaction, and no chain was continued.

In 39 messages, ideas were posted that reflect a generally accepting stance towards the media. Participants posted ideas such as: 'Without a doubt, taking advantage of the best of each model allows us to train professionals with problem-solving skills for their professional work,' 'the traditional face-to-face model is obsolete and we should be moving towards a hybrid model that takes advantage of the benefits of face-to-face and online work,' "Problem-based learning can be part of this new dynamic, not only for students but also for tutors," 'Personally, I find the flipped classroom model very interesting and believe that its implementation in the learning units I teach could be quite beneficial,' and 'The traditional face-to-face model is obsolete and we should be moving towards a hybrid model that takes advantage of both face-to-face and online work."

These messages show that the teachers participating in the course accept as positive the new models that incorporate media and offer new possibilities for teaching.

Thirty-four messages were found with indicators of reflections on the media studied, with phrases such as 'the main problem is not the use of technology but a pedagogical problem, since it is not the same to be the guru who imposes their knowledge as it is to give students a certain amount of freedom to investigate and reason for themselves so that they can solve problems on their own,' "This chapter makes us reflect on the evolution of learning.

A traditional model that has worked for many years now faces a digitalised world and students familiar with the use of electronic devices and digital platforms, ' 'I began to reflect on what to do, what to take up again, what to leave aside, which strategies are really working as initially planned? I have thought about which activities are worth restructuring, which tools to incorporate, among other aspects. We are just getting started, and I truly believe that we have a great challenge ahead of us."

Participants focused more on fulfilling the assignment than on generating in-depth dialogue or sharing experiences from their teaching practice, as evidenced by the low number of messages about teaching practice (18) compared to those about interaction with others (73).

Messages about their practice included: 'In my personal experience in some of the learning units I am responsible for, I have applied this hybrid method, and I have encountered some problems with students who are not used to this method,' 'This semester, we have encountered students with difficulties connecting to the internet, with computers shared with siblings, which slows down their process,' 'I have found that when giving timely and almost instantaneous feedback to students when they are working from home, it is complicated, especially because each student works at their own pace and last-minute questions usually arise.'

Conclusions

The research aimed to identify the type of interaction and messages posted by trainee teachers in a virtual forum. Considering that only the messages from the first of the four chapters of the course were analysed, it is not possible to make generalisations, only contributions based on the findings.

When analysing the messages posted in the first chapter of the course under study, it is noted that the instructions were very general and no clear guidelines for participation were given, which may explain the lack of ideas about the models reviewed, whether in terms of characteristics, stance or challenges to their implementation. This can be attributed to the ambiguity of the instructions and the lack of clear guidelines for participation. This finding is consistent with the views of [Reyes-Angona, et al. \(2023\)](#), who state that 'discussion forums need a pedagogical design that promotes the social construction of learning.' In this case, the instructions, being so general, did not fulfil that purpose.

When it comes to education in virtual environments, discussion forums are an important communication tool, in this case the space for comments, since being asynchronous allows participants to socially construct knowledge among peers through reflection and analysis of what is being posted, respecting the times for posting.

The inclusion of indicators on positions and reflections suggests that it was a forum that presented levels of analytical and critical thinking that could have been exploited further if the discussion in the forums had been achieved by setting up discussion chains triggered by these contributions. According to García-Vargas et al. (2022), asynchronous discussion allows for more reflective learning; however, in the study conducted, the lack of clear guidance seems to have prevented that reflection from fully developing.

On the other hand, finding few statements about the participants' teaching practice can be interpreted as a weakness, either because the participants did not feel that the forum was an appropriate space to narrate their experience or because the instructions did not encourage them to do so.

Future research will analyse the type of interactions and messages that are achieved when the course in virtual learning environments is pre-designed and supported and accompanied by an advisor.

Conflict of interest

The authors declare that they have no conflict of interest. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Contribution of the authors

Alatorre Rojo Elba Patricia: Her contribution was the idea for the project, the development of the method, the coding, the analysis and discussion of results, as well as the final drafting of the document.

Pacheco Cortés Adriana Margarita: She contributed to the method, coding, and literature review.

Galindo González Leticia: She contributed to the coding, literature review, and final draft review.

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