The Hashtag #CharlasEducativas as a Teacher Affinity Space on Twitter

El hashtag #CharlasEducativas como espacio de afinidad docente en Twitter

Ingrid Mosquera-Gende. Associate Professor, International University of La Rioja (Spain) (ingrid.mosquera@unir.net) (https://orcid.org/0000-0001-6229-8883)

Paula Marcelo-Martínez. Post-doctoral Researcher and Professor, University of Seville (Spain) (pmarcelo@us.es) (https://orcid.org/0000-0002-6727-6437)

Ana Yara Postigo-Fuentes. Post-doctoral Researcher and Professor, University of Düsseldorf (Germany) (ana.postigo.fuentes@hhu.de) (https://orcid.org/0000-0001-7965-1911)

Manuel Fernández-Navas. Interim Associate Professor, University of Málaga (Spain) (mfernandez1@uma.es) (https://orcid.org/0000-0002-9445-2643)

ABSTRACT

Twitter has positioned itself as one of the social networks most used by teachers, generating teacher affinity spaces for them to share and collaborate. This study analyses the hashtag #CharlasEducativas, to explore whether it represents a teaching affinity space on this social network. It is a hashtag linked to an educational project created in Spain and related to all educational stages in a cross-cutting manner. Using a mixed methods research, 6073 tweets with the hashtag #CharlasEducativas, published between January 2020 and July 2022, were analysed, including a total of 761 Twitter profiles. Using the software MAXQDA, a category system was developed to classify the most frequent topics in the interactions and to study the tone of the discourse. The social network analysis software Graphext was used for in depth analysis of the profiles with the highest participation. It was confirmed that the characteristics of affinity spaces (collaboration, horizontal nature, creation of community, existence of hierarchy and source of informal learning) were met. The interactions linked to this hashtag are positive, friendly and with a close and relaxed tone, which favours the generation of a group feeling, facilitating informal learning. In addition, the space has a strong hierarchy with leadership roles that allows the information to flow and be fed continuously.

RESUMEN

Twitter se ha posicionado como una de las redes sociales más empleadas por el profesorado, generando espacios de afinidad entre docentes, en los que compartir y colaborar. Este estudio analiza el hashtag #CharlasEducativas, para comprobar si supone un espacio de afinidad docente en esta red social. Se trata de un hashtag vinculado a un proyecto educativo creado en España y relacionado con todas las etapas educativas de manera transversal. Realizando una investigación de carácter mixto, se han analizado 6073 tuits con el hashtag #CharlasEducativas, publicados entre enero de 2020 y julio de 2022, incluyendo un total de 761 perfiles de Twitter. Empleando el software MAXQDA se ha desarrollado un sistema de categorías para clasificar las temáticas más frecuentes en las interacciones y estudiar el tono del discurso. Mediante el software de análisis de redes sociales Graphext se ha profundizado en los perfiles con mayor participación. Entre los resultados, se ha confirmado que se cumplen las características de los espacios de afinidad (colaboración, carácter horizontal, creación de comunidad, existencia de jerarquía y fuente de aprendizaje informal). Las interacciones vinculadas a este hashtag son positivas, amables y con un tono cercano y distendido, lo que favorece la generación de un sentimiento de grupo, facilitando el aprendizaje informal. Además, el espacio presenta una marcada jerarquía con roles de liderazgo que permite que la información fluya y se alimente de forma continua.

KEYWORDS | PALABRAS CLAVE

Qualitative Analysis, Interaction Analysis, Social Network Analysis, Informal Learning, Social Network, Twitter.
Análisis Cualitativo, Análisis de la Interacción, Análisis de Redes Sociales, Aprendizaje Informal, Redes Sociales, Twitter.

1. Introduction

Social networks are one of the main sources of informal learning nowadays, promoting the exchange of knowledge and experiences between users and education professionals (Luo et al., 2020). In the educational context, many teachers use social networks such as Twitter to interact, feel accompanied, resolve doubts and find or share teaching resources (Carpenter & Krutka, 2014; Greenhalgh, 2021; Visser et al., 2014).

In the field of research focused on informal learning processes, social networks allow for the creation of what Gee (2004) called affinity spaces. These are online or physical spaces where relationships are created based on shared interests, activities and objectives. These spaces allow for the generation of learning communities comprised of users who are looking to connect and collaborate (Gee, 2017). Looking at previous academic literature on the subject, the following main characteristics of affinity spaces can be extracted:

1. Existence of interaction, collaboration and exchange: the spaces serve to connect people with similar interests in specific fields or topics (Gee, 2017; Rosenberg et al., 2016).
2. Creation of a community feeling: the participants feel accompanied and understood, with a sense of belonging (Gee, 2017; Marcelo-Martínez & Marcelo, 2022).
3. Democratic or horizontal character: open participation is promoted (Daly et al., 2019; Prestridge, 2019).
4. Certain degree of hierarchy: despite what has been highlighted in the previous point, some studies indicate that not all users have the same role, the same level of participation or the same functions in these spaces (Antelmi et al., 2019; Daly et al., 2019; Prestridge, 2019; Wojcik & Hughes, 2019).
5. Informal learning source: the spaces provide opportunities for learning and improving on a personal and professional level (Carpenter & Krutka, 2014; Gende, 2023; Marcelo-Martínez & Marcelo, 2022).

As mentioned above, within these spaces, not all people have the same roles. Authors such as Daly et al. (2019), Prestridge (2019) or Antelmi et al. (2019) have analysed the different profiles that can be found, considering their degree of involvement and interaction in networks. Thus, 90% of the profiles in a network, a community or an affinity space have a more passive and less creative role, being transmitters, senders or distributors of the information or simply gathering content and learning for their use outside of the network. The number of participants needs to be narrowed down to 9% in order to find profiles that function as active contributors or disseminators of information. Only 1% of the profiles can be considered content creators, intermediaries or vocational connectors, or what the academic literature calls influencers, informal leaders or digital artisans, among other options (Gende, 2023; Marcelo & Marcelo, 2021; Miller et al., 2022). All the roles are necessary for an affinity space to function and be considered as such.

On Twitter, hashtags are often highlighted for their potential to constitute affinity spaces, and there is much research on their potential for informal learning and teacher professional development (Carpenter & Krutka, 2014; Gao & Li, 2017; Gee, 2017; Rosenberg et al., 2016). Studies can be found related to specific hashtags, such as #EdChat (Greenhow et al., 2021), or those analysing the differences between various hashtags for teacher professional development (Carpenter et al., 2023; Greenhalgh, 2021). In Spain, there are various examples of studies on teaching affinity spaces on Twitter, highlighting their role in informal learning and in the professional development of their users. Such is the case of the hashtag #claustrovirtual (Marcelo-Martínez & Marcelo, 2022) and the hashtag #CharlasEducativas (Gende, 2023; Marcelo & Marcelo, 2021).

However, it should not be overlooked that social networks also have negative aspects. Specifically, Twitter is considered to be a very controversial platform, a fast-track route for the proliferation of fake news, harassment and hateful behaviour (Burnap & Williams, 2015; Díez Gutiérrez et al., 2022; Konikoff, 2021). However, as mentioned above, this social network is, at the same time, one of the most studied in the field of teacher professional development (Carpenter & Krutka, 2014; Greenhalgh et al., 2018; Greenhow & Lewin, 2016; Singh, 2020) and one of the platforms most preferred by teachers for their informal learning (Fischer et al., 2019; Gomez & Journell, 2017).

This present study focuses on analysing the hashtag #CharlasEducativas as a possible affinity space. This hashtag belongs to a project, in existence since January 2020, which involves holding weekly educational talks via the YouTube platform. Teachers of all education stages, experts and families share their experiences and knowledge with the attendees, who can comment and ask questions in real time. It originated on Twitter, and it is on this platform that most of the communication exchanges take place. Over the years, the project has expanded to other networks such as Spotify and Telegram, becoming a

multi-platform space that has received several awards in Spain (Gende, 2023). This is a hashtag that has been previously highlighted in literature for its relevance to teacher professional development through Twitter (Marcelo & Marcelo, 2021), being one of the most relevant educational hashtags at national level.

Based on this initial approach, the following research questions are proposed:

- Does the hashtag *#CharlasEducativas* comply with the specific characteristics of an affinity space?
- Does the hashtag *#CharlasEducativas* comply with the rule of 90-9-1 for participation on social networks?
- What is the tone of the discourse generated in the communication exchanges around the hashtag *#CharlasEducativas*?

2. Methodology

The methodology used in this research is of a mixed nature, combining qualitative analysis and the analysis of social networks, following the line of research marked out by previous studies, such as that of Díez Gutiérrez et al. (2022), in qualitative analysis, or that of Fischer et al. (2019), in social network analysis.

Using the social network analysis software Graphext (García, 2022), the tweets of 761 users who included the hashtag *#CharlasEducativas* in their messages from January 2020 to July 2022 were analysed. A total of 6073 tweets have been considered, of which 4116 are original messages, 1284 are replies to those messages and 552 are retweets. To collect these messages, we used the social network analysis software Tractor (Marcelo-Martínez & Marcelo, 2022), which makes use of version 2.0 of the Twitter API, extracting a database in excel format of all the messages sent. This database includes relevant variables such as the textual information of each tweet, links, emoticons, gifs, hashtags complementary to *#CharlasEducativas* or the user who sent it, including the number of followers that they have. In addition, it was possible to determine the number of messages that a person has sent to this hashtag and the interactions received (sum of retweets and favourites received for each tweet). All this information has allowed for the analysis of the interactions and activity of the most active users (Fischer et al., 2019), continuing with the 90-9-1 theory of participation on social networks (Antelmi et al., 2019).

In addition to this, using this corpus, it was possible to carry out an analysis of the tweets using categorisation (Flick, 2004; Maxwell, 2012), grouping them by topic and subtopic. Since data analysis in qualitative research does not form a watertight space with respect to data collection (Fernández Navas et al., 2022; Stake, 2010), data analysis begins as data is collected. In this case, the MAXQDA Software has been used. Following an inductive-deductive process (Braun & Clarke, 2021; Maxwell, 2012), a category tree was constructed in three stages: 1) the first researcher created a basic preliminary structure; 2) a second researcher reworked the tree by analysing three blocks of 100 tweets each, from the beginning, middle and end of the study period; 3) the appropriateness of the categorisation and the rigour of the analysis was checked by a third researcher.

At this point, it is necessary to clarify that this categorisation process was not intended to make this category tree immovable and limit the analyses. As can be seen in the description of its elaboration and through all the triangulation processes that have been included in order to add to its rigour and validity (Tracy, 2021), from its inception, the possible appearance of emerging categories has been contemplated: questions on topics that, a priori, did not seem likely to appear given the nature and subject matter of the tweets, but which have emerged during the analysis process.

Finally, 4407 coded segments were analysed, divided into a total of 13 categories with 50 subcategories, organised unevenly according to the information analysed. These categories are related to educational topics (debates, learning and lockdown), information (announcements and advertisements), community building (day-to-day issues, suggestions, recommendations and gratitude) and hashtags related to the project (*#debatedominguero*, *#elvideotutorialdelfinde*, *#enabierto*, *#Space*).

3. Results and Discussion

The following is an analysis of the data related to the hashtag *#CharlasEducativas*. Among other questions, an attempt will be made to check whether it complies with the five points highlighted in the introductory part of this study as characteristic of an affinity space (sense of community, interaction and collaboration, horizontal character, source of informal learning and presence of hierarchy) (Antelmi et al., 2019; Carpenter & Krutka, 2014; Daly et al., 2019; Gee, 2017; Prestridge, 2019; Rosenberg et al., 2016; Wojcik & Hughes, 2019). These points have been compacted into the following three sub-sections.

3.1. Sense of Community, Interaction and Collaboration: a Horizontal Space

Two of the most prominent aspects in the literature on affinity spaces refer to the interaction and communication that takes place within them and which, in some way, facilitate the creation of the feeling of belonging and community that characterises them (Gee, 2017; Rosenberg et al., 2016). The users who participate in the *#CharlasEducativas* highly value the information shared, as well as the interaction and mutual recognition. The construction of the community is based on reciprocity and on the recognition of the achievements and contributions of other users.

In terms of data coding, relevant categories can be identified in the construction of the affinity space, directly related to the idea of community, interaction and collaboration. As can be seen in Figure 1, the most noteworthy of these categories is "gratitude" (1485 tweets), which is addressed to the precursor of the *#CharlasEducativas* as the creator of this space, to the speakers and to the community of users who participate in the affinity space. This responds to another of the characteristics of these spaces: their horizontal and democratic nature (Daly et al., 2019; Prestridge, 2019), as can be seen in encoded tweet number 30 (Cod.30): "Yesterday's #CharlasEducativas with @imgende was unforgettable. ▨▨▨▨▨ ▨ Thank you @imgende for being tireless and untiring. Thanks to @marisabeles @empiezaporlaA @ garrilengua and @erubioperea for being you and for all you do for me. ❤️".

Figure 1: Categories Related to the Idea of Community, Interaction and Collaboration.
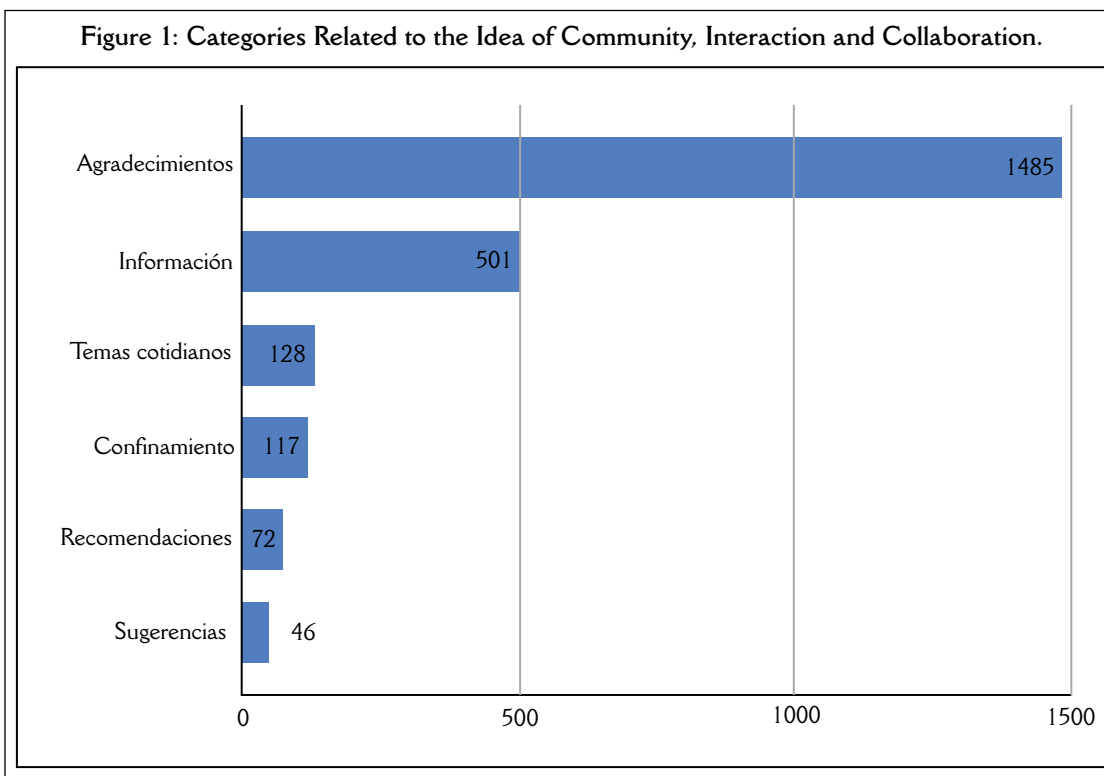
Other relevant categories include "suggestions", "recommendations", "information" or "lockdown", all of which are fundamental aspects for the construction and consolidation of an affinity space on Twitter (Gee, 2017; Rosenberg et al., 2016): "@imgende How have I been able to live without the #CharlasEducativas? I've just watched the latest #SummerEdition with @Carlosnegrin81 and I'm mesmerised. Speechless ☺ I thought that during this lockdown I had triumphed with my self-taught work..." (Cod.4579). Similarly, the categories grouped under the term "information" ("announcements" and "advertising") refer to tweets offering more information about the talks or other educational events, always with an implicit collaborative component.

Another of the keys that could be related to the construction of this space for exchange, learning and gratitude can be found in the category "day-to-day issues", which is one of the emerging categories in this study. These

are contributions, not specifically educational, that refer to saying good morning, commenting on personal incidents or jokes between users, with tweets that stand out for their relaxed and casual tone: "On Wednesdays I can't do anything else. @imgende it's getting harder and harder to miss these #CharlasEducativas, the last one I was listening to while making dinner hahahaha. Full-service training!!!! 🤣🤣🤣🤣" (Cod.5826).

Social theories of discourse show that the way language and speech are manifested in social networks are directly linked to the relationships that are established within a community (Wagner & González-Howard, 2018). Analysing elements of discourse, such as the predominant tone or the use of gifs or emoticons, provides insight into how social relations develop within this space (Carolan, 2013; Heller, 2005; Kadushin, 2012). It should be added that, although a specific subcategory has been created in reference to the tone of humour or a friendly tone, it has been found that the general tone of the tweets analysed is constructive, collaborative, positive and relaxed, highlighting the use of friendly, informal language typical of networks, accompanied by a constant use of emoticons, GIFs or other visual materials (see example in Figure 2).

Figure 2: Screenshot of a Tweet with a Relaxed and Humorous Tone (Cod.5430).

Note. Translation: It's raining in #Zamora. I had no excuse to miss the great @imgende's #CharlasEducativas.
Today with @mariabarcelo @jblasgarcia @AMarquezOrdonez @kikeguerrerot @coralelizondo and @Profe_RamonRG. I've written more notes than when I was in uni! I've dislocated my wrist! Thank you!
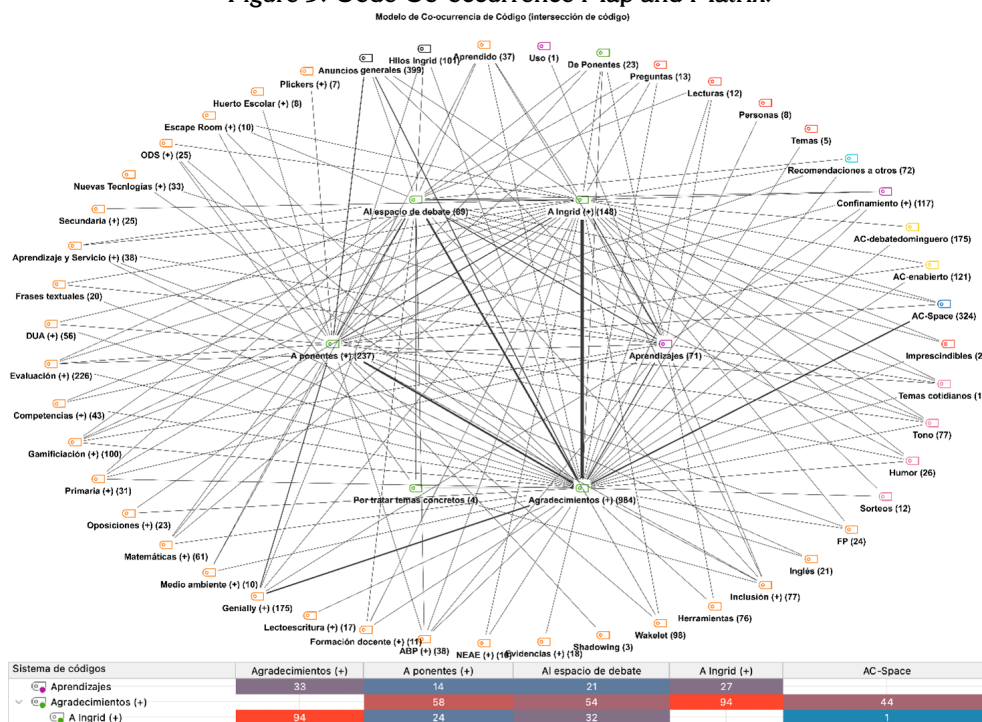
Based on the knowledge that social network analysis has contributed to the sentiment analysis of messages in social networks, understood as polarity or valence analysis, it was possible to establish the characteristics of the discourse present in the hashtag *#CharlasEducativas* in terms of the expressions, words and resources used in these conversations (Çeliktuğ, 2018; Li & Liu, 2014). This has allowed us to classify the content of the interactions that the users share in this digital environment into three categories: positive, neutral and negative. It is noteworthy that 48% of the messages are positive, understood as those in which words in a friendly tone

prevail (grateful, thank you, wonderful, great, etc.). A total of 46.3% of the messages take on a neutral tone, that is, phrases or words that don't carry any personal opinion (Wagh & Punde, 2018), merely informative. Lastly, only 5.7% of the messages contain negative sentiments. In short, an environment of support, learning and gratitude has been created, demonstrating the community's ability to establish a safe and constructive space, far removed from the hateful, negative and destructive discourse that is often associated with this social network (Burnap & Williams, 2015; Díez Gutiérrez et al., 2022; Konikoff, 2021).

Looking further into the relationship between gratitude and the positive tone surrounding the hashtag *#CharlasEducativas*, further connections are found between the analysis categories created. The qualitative analysis software MAXQDA has tools that are very useful for this purpose. This is the case of the Code Relationship Matrix and Network Structure Maps based on the Code Co-occurrence Model. The Network Structure Map serves to visualise the reactions and interactions between codes as a network structure (see Figure 3). In this case, the code with the most significant weighting is that of "gratitude" (f=984), which is most frequently connected with "to speakers" (f=237), "to Ingrid" (f=148), the precursor of the #CharlasEducativas, and "to the discussion space" (f=89). What this intersection of codes represents is the positive social valuation that the community has towards the *#CharlasEducativas* on an emotional level of gratitude and appreciation. This confirms that there is a high level of appreciation among participants for the discussion space generated, for the speakers in the *#CharlasEducativas* and for the precursor. There is a sense of community and belonging that is characteristic of affinity spaces, as discussed above (Gee, 2017). In addition, another element that stands out in the map is "learning" (f=71), which participants highlight in their messages. This is learning that is also interrelated with the previous codes, underlining the value of this space as a source of informal learning, another of the key points of affinity spaces that will be discussed in more detail in the following section (Carpenter & Krutka, 2014).

Figure 3 also includes the other tool mentioned above, the MAXQDA Code Relationship Matrix, which allows for the visualisation of the connections between codes. The number of segments in which two specific codes ("learning" and "gratitude") appear can be observed. The little squares show the number of times that the codes appear together. The symbols located at the individual nodes indicate how many segments have been labelled with the code corresponding to the row and column. Again, the examples of "gratitude" are very prominent.

Figure 3: Code Co-occurrence Map and Matrix.

Sistema de códigos		Agradecimientos (+)	A ponentes (+)	Al espacio de debate	A Ingrid (+)	AC-Space
	Aprendizajes	33	14	21	27	
⌄	Agradecimientos (+)		58	54	94	44
	A Ingrid (+)	94	24	32		1

3.2. The Hashtag *#CharlasEducativas* as a Source of Informal Learning

One of the main indicators that demonstrates if a hashtag can be considered an affinity space is if it can be a source of learning (Carpenter & Krutka, 2014; Marcelo-Martínez & Marcelo, 2022). In addition to what has been mentioned in previous sections, if we count the categories with the highest number of coded segments in the analyses, they respond to the different educational topics covered in the *#CharlasEducativas* (see Figure 4):

Figure 4: Categories of the Main Topics Covered in the *#CharlasEducativas.*
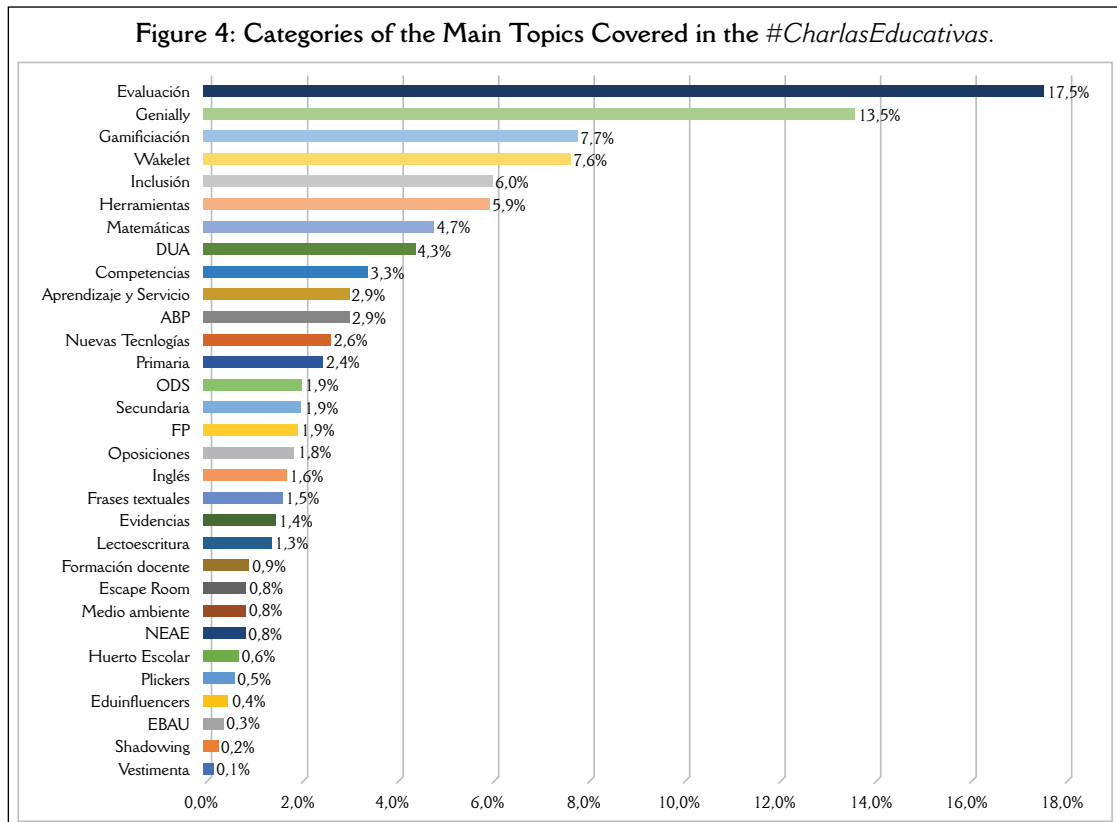
One category that stands out above the rest in terms of the number of coded segments is "evaluation" (17.5%), a cross-cutting theme in education, as it affects all stages and all educational proposals: "Essential to watch and learn with the GREAT @SanmartiNeus talking about #evaluation in the third edition of the #charlaseducativas with @imgende ༼ つ ◕_◕ ༽つ" (Cod.3054). The same occurs with the topics of "inclusion" (6.0%) and the "UDL" (universal design for learning) (4.3%), directly related to inclusion (Carmona, 2020): "#CharlasEducativas with @AMarquezOrdonez UDL in the classroom🎓➡️Reflecting and using resources that make learning more accessible✔ #claustrovirtual #inclusión Thank you @imgende ♟" (Cod.4378). Likewise, the relevance of certain methodologies, such as "gamification" (7.7%), should also be noted, with an extensive representation in the *#CharlasEducativas*: "It was amazing to learn about @fernando_marti7's great work on #gamification in the #charlaseducativas coordinated by @imgende Thank you very much for sharing your very useful ideas and advice with us" (Cod.5885); or certain areas, such as "mathematics" (4.7%), which also plays a prominent role in the talks (Gende, 2023):

I didn't know @ClaraGrima and I loved listening to her. I wish they had explained maths to me with such enthusiasm! I found the graph theory fascinating. Thanks @ClaraGrima and @imgende for this final talk #CharlasEducativas. (Cod.70)

In addition to the above, the relevance of certain profiles of some guests (Marcelo & Marcelo, 2021), either in social networks or outside of them, can also influence the number of comments found on certain topics. This is the case, for example, in "mathematics", with the profiles of disseminators such as @maths4everthink

(13,000 followers on Twitter and author of a website with numerous resources), @AnaBayes (15,000 followers on Twitter, writer and author of a nationally recognised blog in Spain) or @ClaraGrima (74,000 followers on Twitter, writer, TV presenter and winner of several awards for her research work).

Two other very prominent categories are "Genially" (13.5%) and "Wakelet" (7.6%), two digital tools used in the *#CharlasEducativas* to present the schedule of the *#CharlasEducativas*, so they are an intrinsic part of the content (Gende, 2023). In the case of "Genially", many speakers choose it for their presentations and then share the material with the rest of the community. Furthermore, many talks also make direct reference to this digital resource. Overall, the "tools" category (5.9%) includes talks on topics related to digital competence, educational technology and specific tools that can be useful in the classroom. This category was further enhanced in 2020, during lockdown (another important category), in a period when there were talks specifically dedicated to improving the emergency education that occurred, with a necessary link to technology (Adedoyin & Soykan, 2023; Greenhow et al., 2021; Moreno-Fernández & Gómez-Camacho, 2023):

One of the good things about this lockdown is that my daughter has helped me to create my first @ genially_es. ☺ To help my kids learn a bit more about the "culprit" of this lockdown. Thanks to @imgende and to #claustrovirtual #charlaseducativas for the push ☺#profesBioGeo. (Cod.5610)

All these categories respond to themes of educational content that generate informal learning among the participants in the communicative exchanges. Although informal learning is considered to be difficult to regulate and measure, as well as complex in terms of presenting evidence (Sangrà Morer & Wheeler, 2013), the number of explicit mentions that have been found and categorised in the research should not be overlooked, implying that much of the community feels that the talks are a space for learning and teacher professional development (Carpenter & Krutka, 2014; Fischer et al., 2019; Gomez & Journell, 2017; Greenhalgh et al., 2018; Greenhow & Lewin, 2016; Singh, 2020), as can be seen in the following example:

After a full day, you eat, go to physio, do evaluations, dinner, tidy up quickly and watch a talk THAT IS TRAINING on games and you're like it's 10am and freaking out. Thank you @pablofcayqca and @ imgende. I'm watching it again because it's honestly such a good one. #CharlasEducativas. (Cod.30)

3.3. Hierarchy Within the Space

The *#CharlasEducativas* have previously been referred to as a space of horizontal, democratic affinity, built by all and open to dialogue, interaction and collaboration. However, this is a space of affinity led by the disseminator who created the talks (Ingrid Mosquera, @imgende on Twitter), a person of reference, as will be reflected in the data presented below. She is a figure who excels as an intermediary, vocational connector or creator (Antelmi et al., 2019; Daly et al., 2019; Prestridge, 2019), standing out as an informal educational leader in social networks (Marcelo & Marcelo, 2021). Around her profile there are many more users who have been gaining relevance within this affinity space.

By means of a simple word frequency analysis of the sample of tweets, collecting those terms that are repeated at least 150 times and eliminating prepositions and other secondary elements ("stop-words"), we can observe the central role of the precursor of the talks and the appearance of other profiles that surround and accompany her, forming the affinity space of the *#CharlasEducativas*. The most frequently repeated term is "imgende" (f=3038), followed by "thank you" (f=200) and by direct mentions to other members of the community, such as @kikeguerrerot (f=200), @mr_rookes (f=196) or @llume38 (f=173).

It is at this point that the relevance of analysing patterns of participation in this space arises. One of the characteristics of affinity spaces is the presence of a certain degree of hierarchy. This enables the generation of leadership within the community, which is nurtured and nourished by the actions that these roles exercise with respect to the flow of information. Not all users have the same role, the same level of participation or the same functions in these spaces (Antelmi et al., 2019; Daly et al., 2019; Prestridge, 2019; Wojcik & Hughes, 2019).

Considering that the total number of users who participated in the hashtag was 761, it was possible to identify the most active profiles considering the 90-9-1 rule (Antelmi et al., 2019). The research has shown that only 1% of the profiles that participate in a conversation on social networks are the ones that lead and make it possible for the conversation to continue. However, all roles are essential for information to be transferred and distributed to the rest of the network (Daly et al., 2019; Fischer et al., 2019). To determine whether this rule applies here, the number of original messages sent by each person was taken as the criterion for analysis. For the total number of original messages sent, 699 users sent ten messages or

fewer, 54 sent between 11 and 50 and only eight sent more than 50 messages. Thus, only eight participants represent the 1% of this community, the 9% is represented by 69 users and the 90% is made up of 684 users.

Once the eight profiles that had the most active participation in this hashtag were identified, we analysed some variables that allow us to understand their importance within the hashtag (Table 1). As previously mentioned, the #CharlasEducativas project has been created by @imgende, from whose profile the most original messages have been sent (1599). She is followed by @llume38 with 158 messages sent, @ladeidiomas with 128, @lcpastor with 75, @RocioqnR with 67, @mr_rookes with 62 and @kikeguerrerot with 50. The number of messages sent is not always related to a high presence and activity within the hashtag, as other variables such as mentions, retweets, favourites and replies to these messages must be observed in order to obtain these values.

Table 1: Analysis of the Eight Most Active Profiles in the Hashtag #CharlasEducativas.							
User	No. of original tweets	Mentions	Interactions (sum of retweets and favourites received)	No. of replies to original messages received	Incoming connections	Outgoing connections	Degree of centrality	Betweenness centrality
@imgende	1599	3042	63385	7445	798	550	1348	10003835
@llume38	158	173	2458	217	47	214	261	243147
@ladeidiomas	128	48	1233	146	20	101	121	49880
@lc_pastor	80	19	659	98	3	98	101	22060
@paquiflors	75	3	523	93	7	40	47	20402
@RocioqnR	67	34	832	96	14	41	55	14843
@mr_rookes	62	197	2670	212	58	56	114	15300
@kikeguerrerot	50	200	1116	37	59	63	122	24410

In order to delve deeper into the role of these eight users within #CharlasEducativas, it is necessary to analyse variables related to social network analysis, such as the degree of centrality of each user, the number of interactions they generate in the community, their in-degree connections, their out-degree connections and their level of betweenness centrality (Table 1). The above five benchmarks will be used to analyse the connection and informal leaderships that emerge among these profiles (Shea et al., 2020). The "in-degree" represents the connections that a user receives with respect to the rest of their community; that is, the mentions received by a profile in each of the tweets in which it uses the hashtag #CharlasEducativas. The "out-degree" indicates the opposite value: the number of outgoing connections mentioned by a particular subject. In addition, the "degree of centrality" indicates the conjunction of in-degree and out-degree, helping to determine the degree of influence of a profile on both its incoming and outgoing connections. These data contribute to identifying the profiles with influence within the affinity space. Finally, the "betweenness centrality" of these users is analysed, which indicates the degree of influence that each exerts on his or her community. It is a value through which we obtain the number of occasions in which the subject is positioned among the conversations of other people who are not part of his or her network. It serves to measure and demonstrate the influence and leadership of profiles participating in the same social network (Wu et al., 2013).

If we analyse the degree of centrality of the eight most active users in this network, we can see that, after the precursor of the #CharlasEducativas, the second most active user was @llume38, a teacher with the highest degree in this variable and the highest out-degree. This places him as a user who, in addition to participating very frequently, is able to establish connections with other users and to broadcast them. In other words, he creates a community. However, @llume38 is not the profile with the highest level in the five elements analysed. Considering the number of interactions and connections received, which implies a relevant social rating by the community, it is another user, @mr_rookes, who leads in this position. Although he has not participated very often, he is one of the profiles most valued by the community. Something similar happens with @kikeguerrerot, who, although not a user who stands out for a high level of participation, he is one with the highest in-degree and degree of centrality. This places him as a user who is highly valued by the community. These data are also confirmed when analysing the betweenness centrality of these subjects. On the one hand, the precursor of the #CharlasEducativas stands out, presenting a maximum level of betweenness centrality. On the other hand, we can observe that @llume38 is the most influential user within this community. Likewise, @kikeguerrerot stands out as a leader, as does @ladeidiomas, one of the users who has sent the most original tweets. Thanks to this data, it can be affirmed that this network is led by a specific number of profiles that actively participate and allow

information to reach other people both inside and outside their community. Consequently, from this analysis it can be inferred that the degree of influence exerted by a profile on social networks is not only determined by the number of followers they have, but also by other variables such as the in-degree and out-degree of a subject in the network, as well as their betweenness degree (Daly et al., 2019).

4. Conclusions

In line with the analyses carried out and the existing literature on affinity spaces on Twitter, and in response to the first research question, it can be concluded that the hashtag studied meets the key characteristics that define a community as an affinity space. It has been concluded that the *#CharlasEducativas* promote (1) collaboration, interaction, exchange of knowledge and experiences, in an environment focused on appreciation and positive and constructive feedback. In this way, the development of (2) a sense of group and community and (3) a horizontal character is encouraged, which surpasses (4) the leading role of the creator of the *#CharlasEducativas* project, @imgende, who becomes an intermediary or connector of the continuous exchange of information and knowledge that passes through her. The study demonstrates that the environment analysed is an affinity space in which sharing knowledge, experiences and gratitude is common practice; an enabling environment where (5) informal learning and teacher professional development can take place, addressing complex issues within education such as evaluation or inclusion, among others.

In reference to the second research question, according to the analysis of social networks, and considering the variables of degree, number of interactions, in-degree, out-degree and betweenness centrality of the users, it can be concluded that the 90-9-1 rule in networks (Antelmi et al., 2019) is fulfilled in the affinity space of the *#CharlasEducativas*. This helps to understand how synergies are generated in online communities and enables leadership roles to be established that facilitate the distribution of information to others. Thus, the acknowledgements and gratitude are not only focused towards a specific profile, but also towards the space itself and the participants, who each have their own identity and are fundamental in the construction of the community.

Thus, in response to the third research question, all users contribute to a safe environment for sharing on Twitter, in a positive, collaborative, assertive, humorous and appreciative tone. A tone which is far from the hate discourse that is usually associated with the network.

It is hoped that the present study could serve as a reference guide for the basic aspects to consider when defining and analysing possible affinity spaces, through the characteristics detected and analysed. In addition, the affinity space built around the hashtag *#CharlasEducativas* can serve as an example for other communities seeking to foster collaboration, respect and personal and collective growth through the exchange of knowledge and experiences.

Regarding the limitations and prospective of the study, it is important to mention that the evolution of the project over the three years of its existence has not been taken into consideration. The talks are a dynamic element whose purpose, intention, subject matter, etc. have varied from the beginning to the present day, so it is likely that the nature of the tweets has changed and increased in content and quality as the project has progressed. This is a dimension that has not been addressed in the analysis but could be relevant to understanding the dynamics of this affinity space. It should also be noted that the categorisation process has been conditioned by the character limitations of the tweets. In interviews, document analysis, open-ended questions, etc., the process of categorisation is more in-depth than that allowed by the analysis of 280-character tweets. It might be interesting and necessary to analyse in parallel the interactions on YouTube during the live talks or to take into consideration the publications in blogs, newspapers or magazines that have been shared over the years. It would also be relevant to complement the network analysis and the qualitative analysis of the tweets with questionnaires, some of which already exist (Marcelo-Martínez & Marcelo, 2022), or with interviews with the participants and attendees of the *#CharlasEducativas*.

All these aspects could be considered in future research to deepen in the analysis and understanding of how these factors contribute to the consolidation of affinity spaces and, ultimately, how they contribute to improving teacher training through informal learning, in a relaxed, friendly and collaborative way.

Funding Agency

References

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 Pandemic and Online Learning: the Challenges and Opportunities. *Interactive Learning Environments*, *31*(2), 863-875. https://doi.org/10.1080/10494820.2020.1813180

Antelmi, A., Malandrino, D., & Scarano, V. (2019). Characterizing the Behavioral Evolution of Twitter Users and the Truth Behind the 90-9-1 Rule. In *Companion Proceedings of the 2019 World Wide Web Conference* (pp. 1035-1038). ACM. https://doi.org/10.1145/3308560.3316705

Braun, V., & Clarke, V. (2021). To Saturate or Not to Saturate? Questioning Data Saturation as a Useful Concept for Thematic Analysis and Sample-size Rationales. *Qualitative Research in Sport, Exercise and Health*, *13*(2), 201-216. https://doi.org/10.1080/2159676X.2019.1704846

Burnap, P., & Williams, M. L. (2015). Cyber Hate Speech on Twitter: an Application of Machine Classification and Statistical Modeling for Policy and Decision Making. *Policy & Internet*, *7*(2), 223-242. https://doi.org/10.1002/poi3.85

Carmona, C. E. (2020). *Hacia La Inclusión Educativa en La Universidad: Diseño Universal Para El Aprendizaje Y La Educación De Calidad*. Ediciones Octaedro. https://go.revistacomunicar.com/NIPmPh

Carolan, B. V. (Ed.). (2013). *Social Network Analysis and Education: Theory, Methods & Applications*. Sage Publications. https://doi.org/10.4135/9781452270104

Carpenter, J. P., & Krutka, D. G. (2014). How and Why Educators Use Twitter: a Survey of the Field. *Journal of Research on Technology in Education*, *46*(4), 414-434. https://doi.org/10.1080/15391523.2014.925701

Carpenter, J. P., Morrison, S. A., Rosenberg, J. M., & Hawthorne, K. A. (2023). Using Social Media in Pre-service Teacher Education: the Case of a Program-wide Twitter Hashtag. *Teaching and Teacher Education*, *124*, 104036. https://doi.org/10.1016/j.tate.2023.104036

Çeliktuğ, M. F. (2018). Twitter Sentiment Analysis, 3-way Classification: Positive, Negative or Neutral? In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 2098-2103). IEEE. https://doi.org/10.1109/BigData.2018.8621970

Daly, A. J., Liou, Y.-H., Fresno, M. D., Rehm, M., & Bjorklund Jr, P. (2019). Educational Leadership in the Twitterverse: Social Media, Social Networks, and the New Social Continuum. *Teachers College Record*, *121*(14), 1-20. https://doi.org/10.1177/016146811912101404

Díez Gutiérrez, E. J., Verdeja Muñiz, M., Sarrión Andaluz, J., Buendía, L., & Macías Tovar, J. (2022). Discurso Político De Odio De La Ultraderecha Desde Twitter en Iberoamérica. *Comunicar: Revista Científica Iberoamericana De Comunicación Y Educación*, *30*(72), 101-113. https://doi.org/10.3916/C72-2022-08

Fernández Navas, M., Postigo Fuentes, A. Y., Pérez Granados, L., & Alcaraz Salarirche, N. (2022). Cómo Hacer Investigación Cualitativa en El Área De Tecnología Educativa. *RiiTE Revista Interuniversitaria de Investigación en Tecnología Educativa*, 93-116. https://doi.org/10.6018/riite.547251

Fischer, C., Fishman, B., & Schoenebeck, S. Y. (2019). New Contexts for Professional Learning: Analyzing High School Science Teachers' Engagement on Twitter. *Aera Open*, *5*(4), 1–20. https://doi.org/10.1177/2332858419894252

Flick, U. (2004). *Introducción a La Investigación Cualitativa*. Morata. https://go.revistacomunicar.com/aYt61o

Gao, F., & Li, L. (2017). Examining a One-hour Synchronous Chat in a Microblogging-based Professional Development Community. *British Journal of Educational Technology*, *48*(2), 332-347. https://doi.org/10.1111/bjet.12384

García, P. G. (2022). Las Redes Sociales en La Investigación Social. *Miscelánea Comillas. Revista de Ciencias Humanas y Sociales*, *80*(157), 407-428. https://doi.org/10.14422/mis.v80.i157.y2022.009

Gee, J. P. (Ed.). (2004). *Situated Language and Learning: a Critique of Traditional Schooling*. Psychology Press. https://doi.org/10.4324/9780203594216

Gee, J. P. (2017). Affinity Spaces and 21st Century Learning. *Educational Technology*, *57*(2), 27-31. https://go.revistacomunicar.com/U71Ehb

Gende, I. M. (2023). *Aprendizaje informal en redes: Twitter y las #CharlasEducativas*. Ediciones Octaedro. https://doi.org/10.36006/16414

Gomez, M., & Journell, W. (2017). Professionality, Preservice Teachers, and Twitter. *Journal of Technology and Teacher Education*, *25*(4), 377-412. https://go.revistacomunicar.com/BsCx0K

Greenhalgh, S. P. (2021). Differences Between Teacher-focused Twitter Hashtags and Implications for Professional Development. *Italian Journal of Educational Technology*, *29*(1), 26-45. https://doi.org/10.17471/2499-4324/1161

Greenhalgh, S. P., Staudt Willet, K. B., Rosenberg, J. M., & Koehler, M. J. (2018). Tweet, and We Shall Find: Using Digital Methods to Locate Participants in Educational Hashtags. *TechTrends*, *62*(5), 501-508. https://doi.org/10.1007/s11528-018-0313-6

Greenhow, C., & Lewin, C. (2016). Social Media and Education: Reconceptualizing the Boundaries of Formal and Informal Learning. *Learning, Media and Technology*, *41*(1), 6-30. https://doi.org/10.1080/17439884.2015.1064954

Greenhow, C., Staudt Willet, K. B., & Galvin, S. (2021). Inquiring Tweets Want to Know:# Edchat Supports for# Remoteteaching During Covid-19. *British Journal of Educational Technology*, *52*(4), 1434-1454. https://doi.org/10.1111/bjet.13097

Heller, M. (2005). Discourse and Interaction. In *The Handbook of Discourse Analysis* (pp. 250-264). Wiley. https://doi.org/10.1002/9780470753460

Kadushin, C. (2012). *Understanding Social Networks*. Oxford University Press. https://bit.ly/473Q8w5

Konikoff, D. (2021). Gatekeepers of Toxicity: Reconceptualizing Twitter's Abuse and Hate Speech Policies. *Policy & Internet*, *13*(4), 502-521. https://doi.org/10.1002/poi3.265

Li, G., & Liu, F. (2014). Sentiment Analysis Based on Clustering: a Framework in Improving Accuracy and Recognizing Neutral Opinions. *Applied Intelligence*, *40*(3), 441-452. https://doi.org/10.1007/s10489-013-0463-3

Luo, T., Freeman, C., & Stefaniak, J. (2020). "Like, comment, and share"—professional development through social media in higher education: A systematic review. *Educational Technology Research and Development*, *68*(4), 1659-1683. https://doi.org/10.1007/s11423-020-09790-5

Marcelo-Martínez, P., & Marcelo, C. (2022). Espacios de afinidad docente en Twitter: El caso del hashtag #Claustrovirtual. *Revista de Educación a Distancia (RED)*, *22*(70), 1-30. https://doi.org/10.6018/red.510951

Marcelo, C., & Marcelo, P. (2021). Educational Influencers on Twitter. Analysis of Hashtags and Relationship Structure. *Comunicar*, *29*(69), 73-83. https://doi.org/10.3916/C68-2021-06

Maxwell, J. A. (2012). *Qualitative Research Design: An Interactive Approach*. Sage Publications. https://go.revistacomunicar.com/NUpyhu

Miller, E. M., Jolly, J. L., Latz, J. N., & Listman, K. (2022). Influencers and Major Themes in a Gifted Education Community of Practice on Twitter. *Journal of Advanced Academics*, *33*(3), 469-504. https://doi.org/10.1177/1932202X221099590

Moreno-Fernández, O., & Gómez-Camacho, A. (2023). Impact of the Covid-19 Pandemic on Teacher Tweeting in Spain: Needs, Interests, and Emotional Implications. *Educación XXI*, *26*(2), 185-208. https://doi.org/10.5944/educxx1.34597

Prestridge, S. (2019). Categorising Teachers' Use of Social Media for Their Professional Learning: a Self-generating Professional Learning Paradigm. *Computers & Education*, *129*, 143-158. https://doi.org/10.1016/j.compedu.2018.11.003

Rosenberg, J. M., Greenhalgh, S. P., Koehler, M. J., Hamilton, E. R., & Akcaoglu, M. (2016). An Investigation of State Educational Twitter Hashtags (Seths) as Affinity Spaces. *E-learning and Digital Media*, *13*(1-2), 24-44. https://doi.org/10.1177/2042753016672351

Sangrà Morer, A., & Wheeler, S. (2013). Nuevas formas de aprendizaje informales: ¿o estamos formalizando lo informal? *RUSC, Universities & Knowledge Society*, *10*(1), 286-293. https://doi.org/10.7238/rusc.v10i1.1689

Shea, D., Alemu, D. S., & Visser, M. J. (2020). A Social Network Study of Transformational Teacher Influence. *Teacher Development*, *24*(5), 603-625. https://doi.org/10.1080/13664530.2020.1818614

Singh, L. (2020). A Systematic Review of Higher Education Academics' Use of Microblogging for Professional Development: Case of Twitter. *Open Education Studies*, *2*(1), 66-81. https://doi.org/10.1515/edu-2020-0102

Stake, R. F. (2010). *Investigación De Estudios De Casos*. Morata. https://bit.ly/3ObAHco

Tracy, S. (2021). Calidad Cualitativa: Ocho Pilares Para Una Investigación Cualitativa De Calidad. *Márgenes Revista De Educación De La Universidad De Málaga*, *2*(2), 173-201. https://doi.org/10.24310/mgnmar.v2i2.12937

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The Implications of Twitter as a Self-Directed Professional Development Tool for K–12 Teachers. *Journal of Research on Technology in Education*, *46*(4), 396-413. https://doi.org/10.1080/15391523.2014.925694

Wagh, R., & Punde, P. (2018). Survey on Sentiment Analysis Using Twitter Dataset. In *2018 Second International Conference on Electronics, Communication and Aerospace Technology (ICECA)* (pp. 208-211). IEEE. https://doi.org/10.1109/ICECA.2018.8474783

Wagner, C. J., & González-Howard, M. (2018). Studying Discourse as Social Interaction: the Potential of Social Network Analysis for Discourse Studies. *Educational Researcher*, *47*(6), 375-383. https://doi.org/10.3102/0013189X18777741

Wojcik, S., & Hughes, A. (2019). *Sizing Up Twitter Users*. Pew Research Center. https://go.revistacomunicar.com/HL0roj

Wu, Q., Qi, X., Fuller, E., & Zhang, C.-Q. (2013). "Follow the Leader": a Centrality Guided Clustering and Its Application to Social Network Analysis. *The Scientific World Journal*, *2013*, 368568 https://doi.org/10.1155/2013/368568