


# Is collaborative learning inclusive? Case study on its application in a fully online university

## ¿Es inclusivo el aprendizaje colaborativo? Estudio de caso sobre su implementación en una universidad en línea



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### ABSTRACT

Online collaborative learning offers several advantages for the development of learners' competencies, including cognitive, metacognitive, and affective aspects. However, its implementation in teaching is challenging, especially regarding the participation of learners with disabilities. Professors play a crucial role in promoting the equitable participation of all students. In this investigation, we conducted a case study focused on exploring the perspectives of 12 professors from an online university with experience in supporting learners with disabilities in collaborative activities. We carried out semi-structured interviews, which were analysed using thematic analysis. According to our participants, there are limitations in terms of accessibility, flexibility, and socio-emotional aspects that hinder the full participation of some students in online collaborative learning. The role of professors as mediators, facilitators, guides, and learning managers often empower learners with disabilities to engage in interactive spaces, discussions, and teamwork activities. Collaborative learning requires strengthening the affective skills of all those involved, as well as making collaborative practices more flexible and providing a variety of media to enable everyone to participate. This poses a dilemma for professors, who have to balance the use of accessible and flexible practices with the promotion of emotional connections. Institutional efforts are therefore needed to make online collaborative practices suitable for all, and to provide professors with access to the appropriate knowledge, information, and resources that enable them to adopt an inclusive approach.

**Keywords:** distance education; higher education; group learning; online interaction; equal opportunities.

### RESUMEN

El aprendizaje colaborativo en línea ofrece numerosas ventajas para el desarrollo de las competencias del estudiantado, abarcando aspectos cognitivos, metacognitivos y afectivos. No obstante, su aplicación en la práctica docente enfrenta algunos desafíos, especialmente respecto a la participación de los estudiantes con discapacidad. El profesorado desempeña un papel fundamental para promover la participación equitativa de todo el estudiantado. Esta investigación se basa en un estudio de caso centrado en explorar las perspectivas de 12 profesores de una universidad en línea con experiencia en el acompañamiento de estudiantes con discapacidad en actividades colaborativas. Realizamos entrevistas semiestructuradas, analizadas a través del análisis temático. Según nuestros participantes, existen limitaciones respecto a la accesibilidad, flexibilidad, así como referente a aspectos socioemocionales que dificultan la plena participación de algunos estudiantes en el aprendizaje colaborativo. Su rol de mediadores permite que los estudiantes con discapacidad a menudo se involucren en los espacios de interacción, los debates y el trabajo en equipos. El aprendizaje colaborativo requiere el fortalecimiento de las competencias afectivas entre todos los involucrados, así como la flexibilización de las dinámicas de colaboración y la diversificación de los medios de trabajo para favorecer la participación de todo el estudiantado. Lograr esto representa un dilema para el profesorado, quienes deben buscar un balance entre la accesibilidad de las prácticas y el fomento de las relaciones afectivas. Consecuentemente, es necesario un esfuerzo institucional para convertir en inclusivas las actividades colaborativas y que el profesorado tenga acceso a los conocimientos, información y recursos adecuados para un enfoque inclusivo.

**Palabras clave:** educación a distancia; estudios universitarios; trabajo en equipo; interacción; igualdad de oportunidades.

## INTRODUCTION

Online collaborative learning or computer-supported collaborative learning (CSCL) is a constructivist approach in which learning is achieved through social interaction and the exchange of ideas, information, and opinions (Badia et al., 2017; Cress et al., 2015). Academic literature has highlighted the benefits and advantages of collaboration in online learning environments for learners' cognitive, metacognitive, social, and emotional development (Järvelä et al., 2016; Kumi-Yeboah, 2019). Research has also emphasised the effectiveness of collaborative learning in fully online or blended learning environments, citing an increase in professor-learner and learner-learner interactions (Castellanos Ramírez & Niño Carrasco, 2020; Wengrowicz et al., 2018). The literature also highlights the enhancement of learners' motivation to learn (Strauß & Rummel, 2021; Thomas & Thorpe, 2019), as well as their key role in knowledge building, the acquisition of meaningful learning, and the development of critical thinking and problem-solving skills (Saritama et al., 2022; Zhang et al., 2022). However, the discussion also focuses on the difficulties of implementing collaborative learning in online learning environments (Chen et al., 2021; Reyes et al., 2023), the exclusive use of cognitive and procedural approaches (Jeong et al., 2019; Lock & Redmond, 2021), the imbalance in learners' contributions (Capdeferro & Romero, 2012; Zapatero et al., 2022) and lack of innovation (Ruys et al., 2014).

Several types of students, including those living with disabilities, chronic illnesses, or mental health conditions, choose online higher education because of the advantages it offers in terms of flexibility (Fichten et al., 2020; Reyes et al., 2023). Thus, there is an urgent need for in-depth research into the strategies that online professors should use to facilitate the equitable participation of all learners in collaborative knowledge building. Supporting the diversity of learners entails considering aspects such as the accessibility of learning resources and materials, technical and emotional support, and, of course, pedagogical monitoring (Kocdar & Bozkurt, 2022; Reyes & Meneses, 2022). Ensuring that all learners have access to these conditions is crucial for the effectiveness and equity of collaborative learning (Kalir, 2018; Kumi-Yeboah, 2019). However, putting this vision into practice is extremely complex due to the diversity of learners' needs, requiring training, support, and resources for professors.

Some learners with disabilities may find it difficult to access resources and online learning environments (Reyes et al., 2022). For instance, students with hearing impairments struggle to communicate through audiovisual formats without textual support (Rao et al., 2021). Those with visual impairments tend to have difficulty accessing graphic and text-based resources that cannot be processed by text or screen readers (Rodrigo & Tabuenca, 2020). Furthermore, less visible groups such as those with learning difficulties, developmental disorders, and mental health conditions often face challenges in social interaction and collaboration, which can lead to socio-emotional problems (Gehret et al., 2017; Murphy et al., 2019). Previous research suggests that a considerable number of learners choose to study online to avoid the inconveniences of in-person social contact, such as stigma and discrimination (Melián & Meneses, 2022). Hence, their participation in certain activities, such as teamwork, could be challenging for them.

Online collaborative learning demands a high degree of autonomy and co-regulation (Badia et al., 2010). These demands may conflict with the needs of some learners, depending on their individual condition. For instance, students with neurodevelopmental and emotional regulation disorders often have difficulties with

self-regulation, organisation, and planning (Dahlstrom-Hakki et al., 2020; Moon & Park, 2021). The needs of these learners clash with the competencies required for collaborative learning, as executive functions play an important role in collaborative knowledge building (Järvelä et al., 2016). Despite their importance in online collaborative learning, there is a lack of research on crucial topics such as self-regulated and co-regulated learning among learners with disabilities.

Online collaborative learning can facilitate learning and academic success, but focusing it on a non-inclusive approach can be an important cause for learners to drop out of university (Strauß & Rummel, 2021). Therefore, it is now a priority to take measures to promote equitable collaboration and supportive environments (Sánchez-Rojas, 2019). In this context, the role of professors as learning facilitators and guides in both organisational and personal aspects is crucial to ensure the full participation of all learners in social interaction and collaboration processes (Hernández-Sellés et al., 2023; Thomas & Thorpe, 2019). Professors need to adapt not only to the context of the learning environment, but also to the diversity of learners who opt for online higher education. Therefore, their responsibilities are wide-ranging and include designing and applying innovative learning strategies; creating suitable learning materials; managing, organising, and assessing learning; supporting learners; promoting motivation and self-regulation; and demonstrating a willingness to continuously improve their practice (Hernández-Sellés et al., 2023; Kalir, 2018).

## Research context

This research was carried out in a Spanish online university, which currently has the second highest number of learners with disabilities in Spain. The university's educational model puts the learner at the centre and is based on four pillars: flexibility, collaboration, interaction, and personalised learning. To implement this model, the university offers a wide range of digital resources in multiple formats, a fully online learning environment, communication tools to promote asynchronous interaction and collaboration, and student support from professors, academic advisors, and student services. In terms of teaching staff, the university has two distinct figures. Full-time professors are responsible for designing curricula, managing, and preparing learning resources and materials, and leading teaching and assessment. Part-time professors then teach the courses in the virtual classrooms. This research focuses on the latter group of professors who supervise, assess and support learners' activities.

## Research aim and questions

Learners with disabilities are often invisible in online universities, so research on their inclusion in collaborative knowledge-building processes is virtually non-existent. Therefore, the aim of this study is to analyse professors' perceptions of their role in promoting the involvement of learners with disabilities in online collaborative practices. By focusing our research on improving collaboration and social interaction in online higher education, we can identify the conditions that can make online collaborative learning inclusive for all learners.

The following questions guided the research process:

- a) How do professors address the inclusion of learners with disabilities in interactive and collaborative activities in online higher education?

- b) How do professors perceive the involvement of learners with disabilities in online collaborative learning in a fully online learning environment?
- c) How can professors and online universities promote the equitable participation of all learners in interactive and collaborative learning activities?

## METHODOLOGY

This research is based on the case study design (Yin, 2009), as our aim was to analyse the processes and dynamics within the researched institution. Our analytical framework is centred on an essentialist approach, where exploring participants' specific perspectives serves as the primary source of knowledge. Analysing these experiences and viewpoints is important for understanding the underlying reasons for particular behaviours and decisions (Braun et al., 2015). In this regard, this type of research helps us to understand why things happen and, consequently, to suggest improvements in teaching practice.

### Participants and procedures

The research team first defined the criteria for recruiting participants: (1) at least 2 years' experience as online professors; (2) having implemented collaborative learning activities in their courses; and (3) having experience with learners with disabilities in such courses. After the university's Ethics Committee approved the study, part-time professors were invited to participate. Those interested voluntarily contacted the main researcher to express their wish to participate. Twelve of them were then selected (two from each faculty) according to the established criteria. This strategy enabled us to capture a diversity of perceptions and opinions, taking into account the differences that exist across disciplines and course content. Participants were informed of their rights and conditions of participation prior to the study through an informed consent form, which guaranteed their confidentiality and data protection.

Data were collected through semi-structured interviews conducted via videoconference. The interview protocol was designed based on international literature and then pilot-tested to ensure its clarity and consistency. The themes of the interviews were: (a) promoting interactivity and collaboration among students; (b) experiences of supporting learners with disabilities in interactive and collaborative processes; (c) professors' perceptions of the involvement of these learners in collaborative spaces; and (d) thoughts, challenges and needs around promoting the inclusion of diverse learners in collaborative learning practices. The interviews lasted between 45 and 60 minutes and were transcribed verbatim for later coding and analysis.

The information collected was analysed inductively following the procedures of thematic analysis (Braun et al., 2015; Braun & Clarke, 2006). In line with an essentialist approach, our aim was to orient the analysis towards an experiential dimension, in which we mirrored participants' opinions and viewpoints according to their own realities. Thus, after an exhaustive review and as a product of iterative interactions with the dataset, we focused on identifying participants' experiences, perceptions, and opinions in relation to the research questions, following the six phases of thematic analysis. In this process, the main researcher developed an initial proposal which was discussed, revised, and improved in collaboration with the second author, resulting in the definition of the subsequent analytical themes.

## FINDINGS

The findings are structured around three main themes within which we exhaustively analyse the experiences of our participants. Within the first theme, “Professors as facilitators of online collaborative learning”, we analyse the role of professors in managing tools, strategies, and collaborative processes in both pedagogical and technological dimensions. We also explore affective issues as latent aspects that prove crucial in promoting social interaction and collaboration in a fully online learning environment. Within the second theme, “Involvement of learners with disabilities in collaborative knowledge building”, we analyse professors’ perceptions of learners with disabilities’ participation in discussion and interaction spaces and teamwork activities as the main sources of collaboration in a fully online university. Here, we focus on some critical issues to consider when implementing online collaborative learning, such as the organisation, flexibility, and personalisation of collaborative work dynamics. Finally, within the third theme, “Adopting an inclusive approach to online collaborative learning”, we address our participants’ reflections about some future lines of work aimed at both supporting the work of professors and incorporating measures to enable the fair, equitable and effective participation of all learners in collaborative learning. In this last theme, we discuss the role of institutions in applying inclusive online collaborative learning, which is relevant not only to fully online universities, but also to those that operate on a blended learning model.

### Professors as facilitators of online collaborative learning

Interaction and collaboration tools do not always meet learners’ needs. We found that some informatic applications create accessibility barriers for some learners, depending on the type and severity of the disability they live with. According to our participants, these difficulties are usually experienced by learners with sensory (visual, hearing, and speech) disabilities, for whom certain collaborative environments and tools become disabling. There are courses that require the use of voice-based interaction tools, which create accessibility challenges for learners with hearing and speech impairments. The format in which activities are presented may be problematic for some learners, while enabling access for others. For instance, forums and discussions usually rely on textual interaction, which encourages the involvement of most students, but often hinders the participation of those with visual and learning difficulties, as well as those with physical disabilities that limit their fine motor skills. In this regard, professors have an important role to play in finding solutions, either by suggesting tools and resources to enable the participation of those learners who have previously indicated a specific need, or by offering them alternative learning activities.

Typically, professors solve accessibility problems through accommodations that they manage as needed. According to our participants, this type of action is usually very useful and, if properly handled, helps to facilitate the inclusion of learners with disabilities in collaborative learning activities. The experience of participant (P) 7 illustrates this point: “After we managed the accommodation [this learner] requested, she didn’t contact us again. She presented the assignments, was involved in the group discussions... Everything was fine”. However, there are conflicting situations that concern professors. Firstly, online learning makes it possible for some learners’ needs to go unnoticed unless they ask for support beforehand, which is not always the case. Therefore, by the time professors receive a request for accommodation – very often



from their own learners – learning or assessment activities have already been designed without considering these learners’ needs. In these cases, professors feel compelled to improvise in order to offer a partial temporary solution. Secondly, the skills to be developed can conflict with the learner’s needs, so professors have no alternative but to segregate and offer these learners another activity to do individually. P2 commented on this: “This person with hearing impairment can do the recordings, but everything is done individually; she cannot interact orally with the rest of the learners, nor can she do the listening because it would be so challenging for her”.

The role of professors in promoting online collaborative learning and interaction is closely linked to affective factors. For one, creating an environment of human warmth that fosters mutual support, empathy, respect, and harmonious coexistence is critical and a key part of the process. “When you put yourself in someone’s shoes, especially someone facing difficulties, you understand many things. In an online environment that is very impersonal, it is essential for the student to always feel supported by their professors” (P2). Secondly, fostering interpersonal relationships among learners in a fully online learning environment is quite a challenge nowadays, given people’s lack of time and the physical and emotional distance enforced by the environment, which even affects professors. Lack of interest in socialising is also a barrier. However, this study highlights some very promising experiences of collaboration and mutual support among learners. According to our participants, these synergies, although they vary across learner cohorts, are necessary to make collaborative learning a reality in online learning environments. P9 said:

This is the first time a student has written to me and said: ‘Several students have been talking’. Interacting with each other helps them, because at the end of the day, if you only have contact with professors, you don’t create those [social] bonds that are now being built in the classroom.

Our participants place a high value on both the professor and social presence. These two aspects go hand in hand in promoting interactivity and collaboration in a fully online learning environment where everyone’s involvement is sought. Professors’ mediation is crucial in motivating learners to make such connections. They use their creativity and good will to suggest strategies for promoting interactivity in the classroom. P6 said: “We’ve implemented several initiatives to liven up the forum in order to maintain active participation in the classroom and prevent students from feeling isolated. These include step-by-step exercises and a weekly mathematical challenge directly related to the current course material.” Other strategies used by professors include personalised emails and interacting with the entire classroom through the various official channels, be it text-based messages, pre-recorded videos, or even synchronous videoconferencing. “We organise a reflective discussion. We provide some videos, articles, and questions and the students share their opinions. However, participation is voluntary, so some people join and others do not” (P4).

Communication between professors and learners has to be dynamic and fluid on the one hand, and accessible and usable on the other. In this regard, professors have a transcendental role to play in providing a variety of media and formats to facilitate learner interactions in the appropriate spaces. Participants described strategies such as supplementing text-based messages with voice notes, using live captions in videoconferencing, and combining synchronous audiovisual interactions with textual clarifications. Communicating through audiovisual formats allows for more dynamic and direct interaction, which additionally encourages an emotional bond with learners.

P1 commented: “I communicate using voice notes because it saves me time and is more effective for communication because it’s more human; I can convey emotions and it helps students to better understand what I want to express.” Furthermore, this interaction helps to promote learners’ involvement in collaborative practices. “I always point out on the board that we are building knowledge with this type of activity; together we provide ideas to construct it” (P8). However, our participants are aware that bringing all these aspects together requires a significant investment of time and resources.

### **Involvement of learners with disabilities in collaborative knowledge building**

Engaging learners in interactive activities in a fully online learning environment is still challenging for everyone. Professors have yet to find the formula to recreate the synergies that are easily developed in a bricks-and-mortar university: “I think the contact is very cold online. In the end, you upload the learning material and [the learners] have to figure it out for themselves. The only interaction between professors and students is through emails” (P4). In this respect, our participants make an important effort to organise the discussion spaces carefully to facilitate their usability. It is also important to focus discussion topics as much as possible to avoid an overload of messages and to reduce frustration and overwhelm among learners. P5 described this issue as follows:

We have to be a bit careful with discussions. If a learner logs in, has very limited time, and sees a forum with 82 messages, I think it will only cause them distress. Moreover, the content of these forums is also somewhat scattered, with everyone saying whatever comes to mind.

The potential accessibility problems that these same learning environments can cause make it difficult for learners with disabilities to participate, thus creating an equity gap. Professors adopt measures such as redesigning learning activities and personalisation to promote inclusion. Among other examples, P8 explained: “We focused the debates on more conceptual discussions rather than image analysis, so that this student [with visual impairment] could participate”. In any case, it is important to emphasise that it is usually not the learners’ conditions that create barriers, but the environment. According to the participants, some learners with disabilities develop coping strategies that rely on proactivity, rigour, and persistence to overcome the obstacles they encounter. For instance, P7 commented on a learner with dyslexia: “She was fully aware of what this disability meant. So, she worked carefully on her contributions; they were perfect because she read them, reread them... She had to analyse them very well before posting.”

According to our participants, online discussions are a very effective strategy for collaborative knowledge building. There are both assessable and non-assessable ones, with the latter having a particularly low level of learner participation due to the lack of gratification. Professors highlight two specific aspects: the wealth of ideas and the spontaneity with which learners express themselves. “In the field of design and communication, things are made up of criteria, colours, sensations, and you see [the learners] discussing the topic. I think that helps them a lot” (P7). The participation of learners with disabilities in these spaces varies, although our participants feel that it is not necessarily related to their condition. The exception is students with mental health

conditions, such as neurodevelopmental, emotional, and behavioural disorders, who usually find it difficult to participate in online collaborative learning activities. In our participants' experience, the participation of these learners in discussion spaces is very limited and most of them are reluctant to participate in teamwork activities. Faced with these difficulties, professors feel caught between a rock and a hard place. On the one hand, their empathy and willingness to find a solution are paramount. On the other hand, they feel that they lack the preparation and resources to intervene.

Teamwork is the most challenging activity to promote collaborative learning with students with disabilities. According to our participants, this kind of dynamic affects learners' flexibility and pace of work. Students with disabilities tend to work more slowly than students without disabilities due to circumstances such as mobility issues, mental crises, physical discomfort, and cognitive limitations caused by medication. In this respect, our participants emphasise that the use of text-based and asynchronous tools for collaboration helps to mitigate these difficulties. The professors' experience suggests that working on shared documents tends to be quite compatible with inclusive collaborative learning, although they acknowledge that students sometimes use other media, such as video calls and instant messaging platforms, to organise their work.

However, carrying out text-based and asynchronous collaborative activities with all learners is controversial among professors. This ambivalence is rooted in the nature and characteristics of the courses. Professors from fields such as art and design are very satisfied with the way asynchronous discussions take place in their classrooms. In contrast, professors from fields related to critical thinking or with a technical approach tend to criticise the quality of asynchronous discussions or do not consider using these strategies for pedagogical purposes. P3 shared an opinion on this:

In this asynchronous discussion, each student contributes. I think it's very limited in terms of working with the content. Often students come in when they can, post their contribution, but it's difficult to create a truly interactive dynamic and debate among them, let alone with the professor.

Professors are aware of the potential difficulties of online collaborative learning for certain learners, depending on their disability. P3 reflected: "We send the learning materials to the students, who later work on them through debates and teamwork, but when it comes to internalising certain content, it is more complex. These dynamics can create barriers for learners with certain disabilities". The digital aspect of online learning, together with asynchronous interaction, sometimes limits the ability of professors to mediate and create a warmer learning environment where each learner's participation is equally encouraged. Inclusion strategies do not have to be exclusive to learners with disabilities. Our participants described some measures that can help to create a learning environment with more closeness among learners before moving on to teamwork activities, although there are also concerns that such measures are not enough. P10 described her experience as follows: "In the course forum, apart from the presentation of the course, learners have to choose some priorities, their favourite aspects, topics, interests, etc. and find other classmates with similar affinities. From here, we suggest the formation of groups."



## Adopting an inclusive approach to online collaborative learning

Creating interactive learning environments that focus on fostering collaboration is crucial in online higher education. However, in order to move towards an inclusive collaborative approach, it is necessary to go beyond the inclusion of interactive spaces in the design of virtual classrooms. In this regard, professors stress the importance of “creating an environment that inspires confidence” (P10), so as to encourage support seeking and participation among learners. P5 said: “In the case of mental illnesses, I believe that students need to share their issue with the professor, not to receive preferential treatment, but to feel heard, valued, and at ease.”

Considering the benefits of online collaborative learning for developing competencies, both professors and institutions should aim for a change in teaching practice. According to our participants, it is crucial to ensure that tools, resources, and collaborative activities are based on universal accessibility. “I think accessibility is paramount nowadays, especially for an online university. It needs to be done right now” (P2).

Given the wide range of needs, “Each of the measures implemented can be inclusive for some learners and a barrier for others” (P3), so addressing this requires careful planning that takes into account the accessibility needs of all learners. Providing flexible and diverse media and formats would promote a better experience for all learners: “For [learners with disabilities], it would be advisable to have various channels of communication with students, depending on what they feel most comfortable with or find most useful, combining the written with the visual” (P12). Our participants also believe that it is necessary to listen to students with disabilities, and that no one is better placed to express their needs than the person living with the condition.

The role of professors is key to making inclusive collaborative learning a reality, although institutional support is also important. It is essential that all professionals with responsibilities related to the design of learning activities, resources, and media used for collaborative learning work together with practitioners. It is also important to involve other stakeholders who can bring their ideas to the search for better solutions for learners. For instance, the involvement of academic authorities and learning programme directors is very helpful in both governance and decision-making processes. “We had a student with generalised anxiety disorder. There were several meetings with those involved in managing the degree programme where all parties discussed and agreed on how to ensure her participation in all activities, but it wasn’t easy” (P11).

## DISCUSSION

Professors play an essential role in promoting inclusive collaborative learning in online higher education. Their contribution to managing collaboration tools, organising groups, monitoring learning and assessment activities, and promoting social interaction is crucial. These tasks become complex when the aim is to include all types of learners. In this regard, professors should shift their role to that of a learning facilitator (Hernández-Sellés et al., 2023; Zhu & Ergulec, 2023). In addition to being experts in their field, our findings suggest that professors should focus on managing learning tools and resources to make them fully accessible, promoting learners’ self-regulation, and encouraging the equitable involvement of all learners.

Our research shows that the role of the professor in inclusive collaborative learning is more than delegating activities and assessing learners' performance; it also involves leaning into the emotional and affective aspects of teaching. It is important for learners with disabilities to have an inclusive environment to actively participate in online collaborative learning activities (Reyes et al., 2023). In line with Sánchez-Rojas (2019), professors should consider aspects such as empathy, cordiality, and the ability to connect with learners. In addition to generating learning, it is also important to promote affective relationships and camaraderie among learners in order to foster collaboration (Castellanos Ramírez & Niño Carrasco, 2020). However, fostering this connectedness is a complex and demanding task, which requires designing practices that are equity-oriented (Kalir, 2018) and seeking resources and support mechanisms that facilitate the effective and equitable participation of all learners in collaborative knowledge building.

Tensions between teamwork and the needs of learners with disabilities are evident in this study. Professors often have to mediate issues such as accessibility and social pressure in order to include these learners in group activities. We have found that professors perceive greater difficulties in involving learners with mental health conditions and neurocognitive disorders in teamwork activities and discussions. It is therefore necessary to support learners who have difficulties with participating in collaborative learning in areas such as self-regulation and emotional self-control, self-motivation, organisation, and goal-setting, and social relationship management. For this reason, it is crucial to train learners to work collaboratively in order to ensure both their engagement and the quality of their contributions (Strauß & Rummel, 2021; Wengrowicz et al., 2018). Incorporating this type of support discreetly and subtly is very important, as learners with non-apparent disabilities tend to hide their condition to avoid stigmatisation or differential treatment (Melián & Meneses, 2022). Promoting metacognition, self-regulation, and problem-solving skills is essential when implementing collaborative learning activities in online higher education (Järvelä et al., 2016; Zapatero et al., 2022). However, according to our findings, these aspects are not currently part of current classroom teaching practice.

Our findings also suggest that social interaction and efforts to engage learners in discussion forums are key to promoting inclusive collaboration. Social interaction has been shown essential to the success of online collaborative learning activities and the inclusion of all learners in the learning process (Gehret et al., 2017). Sánchez-Rojas (2019) found that social interaction in online learning environments seldom occurs spontaneously. In this regard, our participants use several measures to make the learning environment more interactive, although there are still limitations in maintaining group cohesion among learners.

Collaborative learning activities promote closer relationships among learners, which encourages the creation of small communities where learners with disabilities or mental health conditions can interact closely (Reyes et al., 2023). In this regard, both our findings and the previous literature suggest a reciprocal relationship between collaboration and social interaction (Strauß & Rummel, 2021; Zhu & Ergulec, 2023). Thus, these two aspects are complementary. However, to promote equitable participation of all learners in collaborative learning activities, professors should be very careful when choosing media, forms, and formats for interaction and collaboration. Our findings suggest that asynchronous and text-based interaction facilitate the involvement of most learners in collaborative learning. Furthermore, according to Sánchez-Rojas (2019) and Zapatero et al. (2022), asynchronous

collaboration encourages reflection and critical thinking, so its adoption is beneficial for all learners.

According to our study, an inclusive collaborative learning approach requires institutional support for professors and the provision of appropriate knowledge, resources, and tools. For instance, in terms of accessibility, the literature suggests presenting and implementing learning activities in multiple formats (Rao et al., 2021), but such a measure is seldom considered when it comes to peer partnership. Collaboration tools, group integration, and activity types also need to be flexible enough to encourage the participation of all learners (Reyes et al., 2023). In this regard, institutions should ensure that collaboration tools are functional and provide sufficient resources for professors to fulfil their responsibilities properly.

### Limitations, implications, and future lines of research

The aim of our research was to explore the perceptions of online professors with teaching responsibilities across multiple disciplines at the bachelor's degree level. As we focused on an in-depth analysis of the participants' different experiences to understand their insights, our findings are not representative. It is therefore necessary to carry out further research in this area, using a mixed-methods approach to gain a broader understanding of the phenomenon. It is also important to bear in mind that our findings are based on a particular educational model that focuses on asynchronous interaction. Although our findings are generalisable in the sense that they can be transferred to other learning environments (Braun et al., 2015), other contexts in which synchrony and asynchrony, as well as online and face-to-face interaction, are combined need to be explored to determine their prevalence.

The benefits of online learning, such as time flexibility and reduced commuting, are attractive to many learners with disabilities. Interestingly, although their presence in online higher education has increased in recent years, these groups of learners remain invisible to both institutions and professors. Hearing what they have to say about the role of collaboration in their learning and the impact of participating in this dynamic would be of great value in understanding their experiences. Such a study would shed light on their needs, expectations, and perceptions, and allow implications to be identified to guide the designers of collaborative learning environments, tools, and pedagogical practices in promoting the inclusion of these learners.

Our findings give pause for thought on the role of professors as enablers of learners with disabilities' involvement in collaborative knowledge building. Likewise, our study may serve as a basis for future research aimed at explaining the complexities of online collaborative learning based on inclusive pedagogy. In terms of practice, the results of this research suggest new lines of work applicable to diverse learning environments, whether fully online or blended. Making collaborative learning environments and tools accessible, preparing learners for collaborative work, promoting social interaction in the classroom, and supporting learners emotionally and in self-regulation are crucial aspects for inclusive collaborative learning. Finally, measures aimed at promoting the equitable participation of all learners in collaborative learning should be the result of carefully developed strategies involving the whole institutional structure.

## CONCLUSIONS

The end goal of collaborative learning is to involve all learners in collaborative knowledge building and problem solving, which is why it is so important to make it inclusive. Without inclusion, collaboration is not possible. Implementing this approach in a fully online and asynchronous learning environment involves a significant duality. Asynchronous interaction makes it easier to overcome social and accessibility barriers. However, it also tends to discourage affective relationships among learners – an essential aspect in promoting their involvement in collaborative knowledge building. Strengthening learners' affective competencies, making work dynamics flexible, and diversifying collaboration media are crucial to address this ambivalence and to enable a balance between comfort and effectiveness in online collaborative learning.

Professors' interventions to promote the equitable involvement of learners with disabilities in online collaborative learning activities are crucial. They are particularly concerned about the inclusion of learners with sensory difficulties, neurocognitive and neurodevelopmental disorders, and mental health conditions. However, they perceive a lack of appropriate knowledge and resources to adequately address these challenges. Therefore, preparing, sensitising, and supporting professors and providing them with accessible tools and resources for all learners is the first compelling step towards making online collaborative learning inclusive. Enhancing professors' ability to embrace and mediate learners' activities would allow for an effective implementation of collaborative learning in online learning environments, thus promoting the inclusion of all learners.

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