PAPER

Inclusive Education from the Contributions in the Virtual Forums of the Students of the Degree of Pedagogy at the University of Malaga

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ABSTRACT

The study of inclusive education (IE) today has a large body of international research that provides insights into the changes and strategies needed to make it a reality. However, we are witnessing the fact that educational and social changes are happening very slowly. We must continue to engage and delve into the judgments and opinions of the individuals who will make it achievable. We conducted a descriptive, analytical, and qualitative study to analyze the contributions of students in the virtual forums of five subjects over three academic years (2019–2020, 2020–2021, 2021–2022) in the pedagogy degree program (1st and 4th year). The study aimed to gather evidence of students' commitment, involvement, learning, and knowledge construction in the context of IE. On the one hand, we have found evidence that students' perceptions of IE are influenced by barriers and facilitators that either enable or restrict the progress of IE. On the other hand, we also present evidence of the level of engagement, reflection, and dedication of the students who have taken part in the online forums of the courses, as well as the knowledge they have gained through their participation. We recognize virtual forums as a space for students to meet, reflect, and collaboratively construct knowledge. It is a valuable tool for gaining insight into how students develop their perceptions, opinions, and learning.

KEYWORDS

student participation, pedagogy, computer-aided learning, university studies, education technology

1 INTRODUCTION

Over the last decade, inclusive education (IE) has emerged as a prominent topic of research and discussion in the field of education [1]. According to [2], faculty attitudes toward inclusive pedagogy affect the quality of student learning. However, despite

the interest it arouses in the research field, and as some research indicates [3], the changes are insignificant in practice because practices that contradict the principles of IE continue to be developed in educational centers.

Inclusive education is a complex, systemic, and multifactorial process that involves the entire educational community, with a particular emphasis on teachers. Among all the dimensions studied, teacher training and attitude are positioned as critical factors in the promotion and development of IE [4]. Therefore, it is crucial to consider initial teacher training as an enabling dimension of inclusive practices [5]. However, this change in initial teacher training often conflicts with established, often streamlined, programs that aim to develop professionals to educate the largest number of students. The prevailing theory of teaching practices, as stated by [6], often contradicts the pedagogy of IE because it is primarily focused on teaching the majority of students, overlooking those whose educational needs differ from the established norms.

According to [7], a significant portion of the initial training provided to future teachers is decontextualized. This highlights the need to reconsider the practice of initial teacher training being developed in faculties of education. In this scenario, we consider it crucial to create additional spaces, times, and strategies to cultivate shared and experiential knowledge within the context of ubiquitous learning [8] and expanded education [9]. In this sense, incorporating virtual mechanisms for learning, reflection, and interaction in initial teacher training involves recognizing that knowledge is constructed through processes of decentralization, delocalization/detemporalization, and dissemination [10]. These processes facilitate lifelong learning.

An example of this is the increasingly widespread use of virtual learning communities as virtual environments that have allowed us to rethink and transform educational contexts [11]. In a specific manner, the utilization of learning environments in university education, such as virtual media-discussion forums, virtual meetings, and digital platforms, enhances blended learning in student training [12]. Additionally, it encourages the adoption of virtual learning environments that deviate from the traditional structure of the university classroom [13]. Furthermore, these learning environments make it possible to evaluate and develop skills and competencies such as students' abilities in expression, argumentation, reflection, and analysis. This helps students move away from the limited forms in which they had previously approached knowledge [10]. Put simply, inclusive education facilitates greater success in achieving learning outcomes for all students because it increases accessibility for every learner.

2 THEORETICAL BASIS AND LITERATURE REVIEW

2.1 Virtual platforms and university students' perceptions of EI

Virtual and asynchronous platforms offer the possibility of fostering a slow and reflective discourse [14] and reducing social pressure on participating students. These platforms allow students to engage in a calm, reflective, and critical manner [15–16]. Virtual forums can be defined as a virtual community (VC) [17], in which, in a self-managed way [18], students exchange positions, opinions, and ideas [19], shared knowledge is collectively built [20], and decisions about the learning process are made [21]. Collaborating, understanding, and considering these virtual discussion forums allows students to self-question, inquire, and construct their learning without the urgency required by face-to-face contexts [22].

Let us explore another national research study that examines the perspectives and stances of practicing teachers and teacher trainees regarding inclusive

education. There is consistency in the results. The study by [7] shows that teachers (80 practicing teachers) have a dichotomous position on inclusion. On the one hand, 48.8% of the teaching staff assumes that the concept of inclusive education is limited exclusively to students with special educational needs. However, on the other hand, another group (56.2%) understands that it should represent all students and considers that any person can experience difficulties at some point in their life. In the same way, it shows that the majority of teachers (87.2%) state that they lack sufficient training to meet the realities of the classroom. They question the fact that their training has been "too theoretical" and "unrealistic." This finding aligns with the results presented by [23] in a study with 418 students at the University of Malaga. The students also question the lack of tools for the socialization of students with special needs, as well as the deficiencies in university teacher training and training in competencies, as the most significant elements in inclusion processes.

In another study presented by [24], university students in their first year of the Primary Education Degree (124 students of the General Didactics subject) at the University of Malaga demonstrated limitations and uncertainties in promoting inclusive practices. In the study presented by [25], which involved 315 students with degrees in psych pedagogy, primary, and early childhood from the Faculty of Education Sciences, it was found that the students generally consider IE as the best approach to working with all students. However, the students who showed positive attitudes towards inclusion had no contact with students with special educational needs. At the same time, this finding aligns with the research conducted by [26], which also found no relationship between training time and positive attitudes towards inclusion. In other words, spending more time on training does not necessarily result in improved skills or perceptions regarding inclusion.

A study [27] examined 124 university students from the Faculty of Education Sciences at the National University of Chimborazo. The study found that the students believed the training they received in the area of attention to diversity and inclusion was well-suited to the needs of the professional context. Additionally, they expressed a positive evaluation of the materials and practical methodologies used. On the other hand, we found a national-international study presented by [28], which involved a total of 652 university students from the Faculties of Education of the University of Northern Arizona, Complutense University of Madrid, and the Autonomous University of Madrid. The results show that 72.3% of the student body encounters barriers to inclusion in materials, methodology, student participation, and faculty roles.

In a study [29] conducted in Australia with 40 university students, it was found that the training environment was inclusive, which contributed to their understanding of the principles of IE. The students stated that an excessive presentation of resources somewhat creates dependency among the students, which limits their ability to seek and adapt resources. The use of resources is a time-consuming but necessary element in the development of IE pedagogy and classroom practices.

3 METHODOLOGY

3.1 Research design

We present a descriptive, analytical, and qualitative study [30] to explore the positionings, skills, arguments, competencies, learning, reflections, and focuses of interest expressed by students regarding inclusive education. This exploration is based on their contributions to the virtual discussion forums on various subjects.

According to [31], the frequency, types, and structure of communication are fundamental elements when discussing engagement in communicative processes. Therefore, in line with the phases of engagement developed by [31–33], our second objective is to analyze the knowledge, reflections, implications, and commitments that inclusion students acquire through their interventions in forums as a means of metacognitive learning about inclusive education (see Table 1).

Table 1. Phases of student involvement and engagement

Phase 1. Clarification and organization of the task: Students review the teacher's guidelines, discuss and reach agreements.
Phase 2. Exchange of information and initial ideas: Students make a first approach to the topic of study, share personal experiences, relevant information, and suggest sources for further information.
Phase 3. Elaboration of psycho-pedagogical intervention proposals: The students elaborate on intervention proposals and solve doubts on the subject.
Phase 4. Synthesis and final agreements: The student body establishes agreements on the content and revises it.

It is essential to clarify that the research has been developed considering a series of ethical issues, such as 1) informing the students of the focus and how the research was going to be carried out; 2) informing them them about the anonymity of the participants; 3) informing about the possibility of eliminating the information and opinions provided at any time during the research; and 4) presenting the possibility of reviewing the publication before it is sent.

3.2 Participants

The participants were students enrolled in the subjects Methodological Bases of Educational Research (BMIE) and Quality Control and Management of Organizations (CGCO) in the Pedagogy degree program at the University of Malaga during the academic years 2019–2020, 2020–2021, and 2021–2022. The population sample consisted of 225 students enrolled in the subjects. The final sample consisted of 132 students, including 93 women (70.4%) and 39 men (29.5%) (Table 2).

Table 2. Subjects and student participants

Courses	Subject	
19–20	*Methodological Bases of Educational Research (MBER)* *Management and quality control of organizations (MQCO)*	60 / 35 (58.3%) 35 / 20 (57.1%)
20–21	*Methodological Bases of Educational Research (MBER)* *Management and quality control of organizations (MQCO)*	60 / 35 (58.3%) 35 / 15 (42.8%)
21–22	*Management and quality control of organizations (MQCO)*	35 / 27 (77.1%)
Total	*Average total participation in the subjects*	132 (58.6%)

The sample was obtained from participants in the virtual discussion forums mentioned earlier. The selection criteria included voluntary participation of students, convenience of the sample, and accessibility to it [34]. At the same time, once each class group was informed of the procedure, we utilized the snowball methodology [35]. This involved students who were present in class informing their absent classmates or students from other groups and contacting the researchers. The aim was to include as diverse a sample as possible.

3.3 Procedure

Based on the model proposed by [36] (see Table 3), we decided to implement the following approach with the students: 1) asking them to write on the platform; 2) encouraging them to find solutions and reflect individually on the topics discussed in the forums, even though these would later be presented collectively; and 3) requiring them to review the written document before sending it.

Table 3. Stages of the cooperative learning process of inclusion

Stages
Stage 1. Explanation of the task
Stage 2. Action protocols (participation review times, conversations, mutual respect, etc.)
Stage 3. Virtual collaborative work protocol
Stage 4. Problem-solving [36]

Nine thematic forums have emerged from this process: school dropout during COVID, return to in-person education, inclusive education, gender equality, education for inclusion, conduct disorder and technology, attention deficit hyperactivity disorder (ADHD), and vocation and education. These topics were previously addressed in our previous work [22]. In this study, we specifically focus on the categories of inclusive education and education for inclusion.

The information analysis was conducted using the technique of inductive coding [34] on the content of the forums. In a specific manner, they were organized into meaningful units, a technique employed for analyzing virtual forums [36]. The information was collected in thematic blocks created as entries by the students. It was subsequently analyzed inductively using the qualitative analysis program Atlas.ti. V.9. (see Figure 1), and finally, the categories were named.
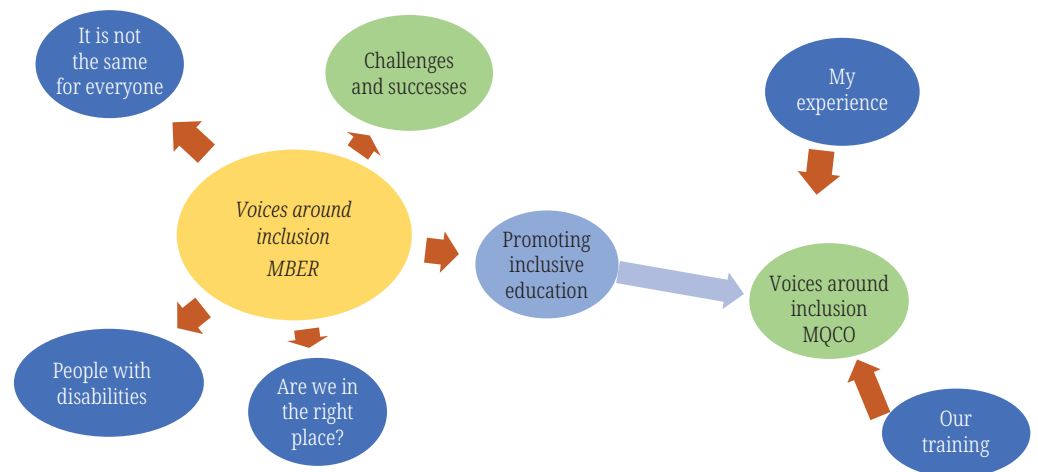
Fig. 1. Thematic blocks proposed by students

As shown in Table 4, the forums received 423 entries, and the two threads with the highest participation were titled "Challenges and Successes" (22.6%) and "Promoting Inclusive Education" (22.2%). In this sense, the number of students enrolled in each subject was higher in BMIE than in GCCO because BMIE is a core subject, while GCCO is an optional subject in the degree program at the University of Malaga.

Table 4. Thematic blocks and participation

Subject	Thematic Forum	Total Number of Messages (%)	Number of Words	Participating Students by Subject and Topic
MQCO (19–20) 35 students	Challenges and successes (in other categories)	96 (22.6%)	5634	20 (100%)
	My experience	23 (5.4%)	2034	18 (90%)
MBER (19–20) 60 students	Characteristics of persons with disabilities (in other categories)	26 (6.1%)	1237	27 (77.1%)
	People with disabilities	32 (7.5%)	1256	15 (42.8%)
	It is not the same for everyone	43 (10.1%)	4234	19 (54.2%)
MBER (20–21) 60 students	Promoting inclusive education	94 (22.2%)	2619	32 (91.4%)
	Are we in the right place?	25 (5.91%)	987	24 (68.5%)
MQCO (20–21) 35 students	What do you think we achieved? (missing from the chart)	50 (11.8%)	3421	15 (100%)
MQCO (21–22) 35 students	Our training	34 (8%)	2532	27 (100%)
	Total	423 (100%)	23.954	197 (100%)

In this section, we demonstrate the alignment between the topics selected by the students (inductive categories) and the four axes utilized for the analysis (deductive categories), along with their respective subtopics (Table 5).

Table 5. Categorical inductive-deductive convergence and subtopics

Inductive Categories	Deductive Categories	Subtopics
Challenges and successes My experience	C1. Limits of educational inclusion	C1.1. Clinical Rehabilitation Model C1.2. Individualization
Characteristics of persons with disabilities People with disabilities It is not the same for everyone	C2. Inclusion from the wrong place	C2.1. Compassion C2.2. Slogan C2.3. Instrumentality
Promoting inclusive education Are we in the right place?	C3. Inclusive education as a necessity	C3.1. Social Imperative C3.2. Commitment
What do you think we achieved?	C4. Moving slowly	C4.1 Recognition and Cooperation C4.2. Fears and uncertainties
Our training	C1. Limits of educational inclusion	

4   RESULTS

In the following, we present the results of this study. First of all, we will respond to the first objective by conceptualizing each deductive category as barriers (B) that hinder the development of IE and facilitators (F) that promote it. Next, we will address the second objective, which is to present evidence of the students' commitments and their collaborative construction of knowledge.

4.1   Limits of educational inclusion

A small group of students (15%) expressed concerns about the way students with educational needs are supported under the principles of IE. In this regard,

these students refer to the personal and behavioral traits of their classmates as factors that impact their academic performance.

> *Inclusive education is indeed good, but I have seen children who sometimes make a big mess in class because they make a lot of noise and shout, which certainly harms their classmates (MBER, 19–20).*
> *For consistency, it is essential to recognize that this type of student body limits the class's work a little, and this is not right (MQCO, 20–21).*

This group of students believes that the processes associated with inclusion in educational institutions, or at least the ones they have observed during their internships, are not effective.

> *The issue of inclusion is still not within everyone's reach (MQCO, 19–20).*
> *The truth is that it is very difficult to work in class with these students, and I do not see it very clearly, although as professionals we must keep trying (MQCO, 21–22).*
> *We have to look for other ways since inclusion is not working, we have been doing it for a long time, and we are still thinking about it (MBER, 20–21).*

Students explicitly perceive some of their peers as viewing their individual characteristics from a pathological perspective. This perception of pedagogy students is worrying because expressions such as "not everyone can be together" (MBER, 19–20) justify the idea of performance as something individualized and personal. Alternatively, we must understand that, yes, we must all fight for inclusion. However, we are all different. Therefore, we must improve the performance of each one, even if this means doing it separately (MBER, 20–21), contributing, consolidating, and segregating discourses and practices [37–38].

Likewise, as seen in Figure 2, the use of terms such as "limiting," "noise," or "bother" perpetuates and reinforces discourses that support rehabilitative and segregating practices. However, some students' responses to these forum entries suggest cooperative strategies, peer learning, or teacher training as possible solutions for peers who see limitations in inclusive education.
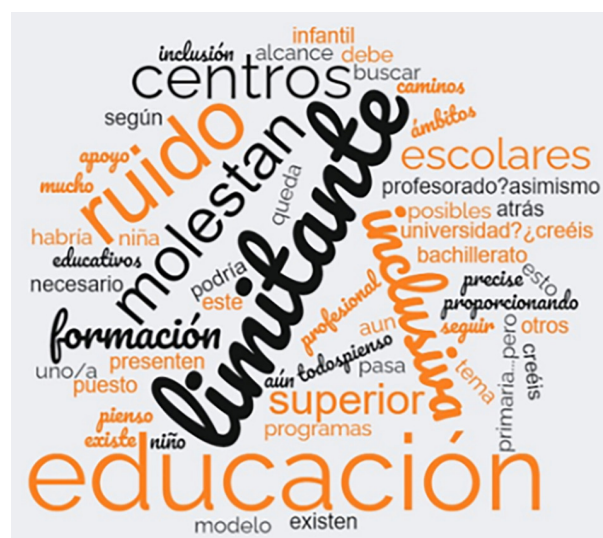

Fig. 2. Word cloud category constraints around inclusion (presented in the original language of the participants)

4.2 Inclusion from the wrong place

At the same time, another more numerous part of the student body (35%), expressed opinions based on a) a paternalistic and compassionate perspective: each disability is unique, and we must understand the needs of the poor (MBER, 19–20); we should know their needs and offer assistance, as I wouldn't want to be in their position (MBER, 19–20); b) an objectifying perspective: I wouldn't know what to do or what tools to use (MQCO, 19–20); and c) an instrumentalized perspective: what scares me the most is the possibility of having a student with ADHD or ASD in my class (MQCO, 19–20); and c) an instrumentalized perspective: I wouldn't know what to do or what tools to use (BMIE, 20–21). To be honest, I wouldn't know how to work with a person with a disability or what techniques to use (MQCO, 21–22). My biggest limitation lies in the techniques I can employ with them (MQCO, 21–22).

Figure 3 shows how students explicitly use words such as disability, characteristics, strategies, ADHD, "I don't know," or "far away" that reinforce this paternalistic, objectifying, and instrumentalized discourse. This discourse has also been replicated in the forums through the use of terms such as diversity, active methodologies, equity, or inclusion.

Fig. 3. Word cloud category "inclusion from the wrong place" (presented in the original language of the participants)

The analyses also show a group of students who perceive IE from an idealistic and dreamy perspective. The students use slogan phrases such as "inclusion is the way for us all to respect each other equally" (MBER, 19–20), "we must accept

everyone equally" (MQCO, 21–22), and "of everyone for everyone" (MBER, 20–21). However, these phrases actually impede the development of IE because they present a superficial and socially acceptable view of inclusion.

4.3   Inclusive education as a necessity

As facilitators, we believe that it is essential and socially imperative for students (20%) to recognize the importance of embracing IE. This signifies a significant and essential shift in current education, as it indicates that we are progressing as a society and that individual differences are becoming more accepted (MBER, 19–20). For this group, concepts such as disabilities, influencing factors, abilities, challenges, etc., which are part of a dominant discourse, should be challenged. This implies that all children in a particular community should learn together, regardless of their individual circumstances, disabilities, abilities, or challenges. It suggests that this should be a common and normal practice, and we should not focus on whether they are more or less capable or whether they meet certain standards or not (MBER, 20–21).

At the same time, they also consider that IE should involve the whole of society to make it possible (see Figure 4).

I believe that inclusive education is necessary in this complex and globalized society in which we live. I believe that the educational system needs inclusive education and not only the educational system but also the whole educational community that integrates it: teachers, students, families (MBER20–21).
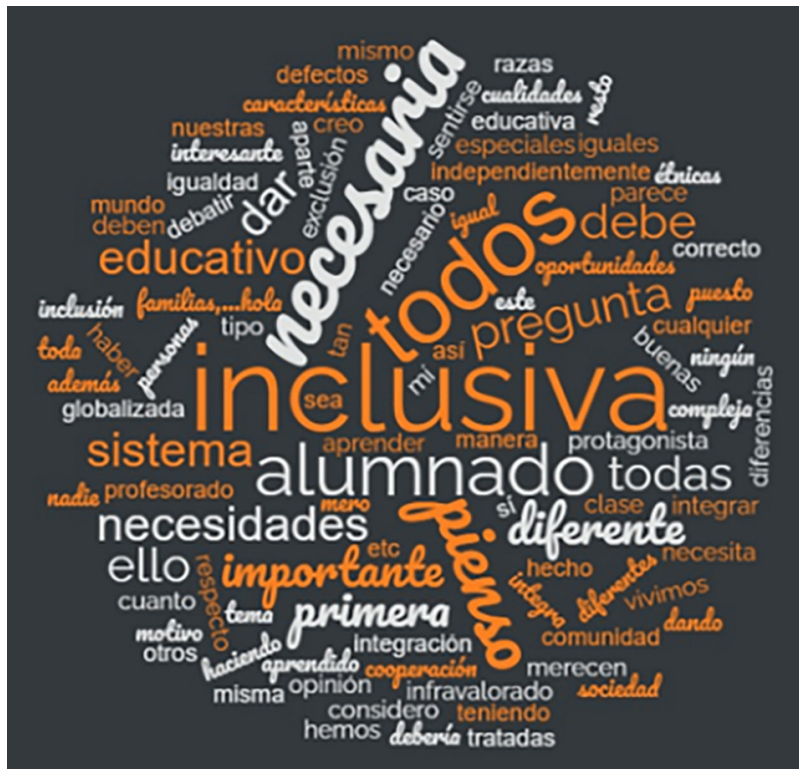

Fig. 4. Word cloud category inclusive education as a necessity (presented in the original language of the participants)

4.4   Moving slowly

Finally, we find a small group of students (13%) who are convinced that we are on the right track. They base their belief on the public's recognition of the progress made in recent decades regarding educational inclusion, specifically in terms of terminology, organization, and regulation.

> I don't know if we are doing the right thing or if another path could be better, but little by little it is being addressed more in legislation and in the activities and group projects that are done in class, always with the intention of improving and with the goal of ending school exclusion (MQCO, 21–22).

They are also supported and comforted by what they refer to as "small victories" to reassure themselves that they are heading in the right direction.

> At least we have made progress in the terminology used in the educational approach; it no longer speaks of children with disabilities, disorders, or problems, but of children with functional diversity, based on the idea that this diversity is part of human diversity (MQCO, 21–22).

Students consider small changes at the school level and believe that university training can contribute to building a more inclusive school. However, they perceive that, throughout their initial training, they have yet to acquire competencies and strategies for this. But won't they have to teach and train us for this? Because I lack practical knowledge in terms of training (MQCO, 21–22), I have not received specific training to work in inclusion, and I have not experienced that reality yet. Until we actually do it, we cannot know if we will be able to do it (MBER, 19–20). Tomorrow, when we have to put it into practice, it will be different, and I believe we will need to continue our training (MBER, 20–21). In this sense, the term "training" repeatedly appears in most of the students' interventions in the forums (Figure 5). Additionally, concepts related to inclusion, such as change, teamwork, and coordination, are mentioned to a lesser extent.

Fig. 5. Word cloud category slowly advancing (presented in the original language of the participants)

With the aim of assessing students' participation, attitude, reflection, and commitment in the collaborative construction of knowledge in the forums, we address the second objective. For this purpose, and considering the studies of [31–33], we analyze the dimensions of involvement, reflection, and engagement (see Table 6).

Table 6. Evidence of involvement, reflection, and shared construction of knowledge in the students

Phase I	(CII-MBER-20–21) But if we know how to do all this as an inclusive school, why isn't it being done, what barriers prevent us from doing it?
	(RJM-MBER 19–20) I think it is an interesting topic that we can talk about, how about giving us a couple of days to look for information on that?
	(SEC-MBER-20–21) These questions seem good to me and it is true that not in all schools, this inclusive education does not exist, or it lags behind. Why do you think this is due to a lack of teacher training?
	Likewise, there is a lot of blame for inclusive education in the schools of Pre-school and Primary but What about higher education such as high school, vocational training or university?
	Do you think that there are programs that present inclusive education in this higher education, we can talk about all this?
Phase II	(CAI-MQCO-21–22) To achieve an inclusive education it is necessary to change the concept of traditional education, so just by changing the traditional method of education we are already making a big change in a positive way because in this concept the master class should be transformed into an active and interesting learning space and forget about the methods that year after year we are dragging without getting new answers.
	(BBP-MBER-19–20) Answering your questions, I think that inclusive education is very important, since it implies that all children in a given community learn together regardless of their personal conditions, handicaps, origin or problems. It is true that not all schools use the inclusive school model and that currently the model in our country is the integrative model, but little by little there are more inclusive schools.
	(SEC-MBER-20–21) I believe that inclusive education is necessary in this complex and globalized society in which we live. I believe that the educational system needs inclusive education, and not only the educational system, but the entire educational community that integrates it: teachers, students, an families.
	(DAE-MBER-20–21) we will ask ourselves what a classroom with inclusive education should be like, and I think that it should: – Have pedagogical proposals to include all students. – Contain different ways of organizing the space, time, and pace of learning. – Eliminate learning barriers. – Promote the participation of all students. – Work jointly and cooperatively with students. – Tutoring in an egalitarian way. – Encourage dialogue in the classroom.
Phase III	(BBP- MBER-19–20) I think that we could look for other ways, since this model is not yet available in all possible areas and in all educational centers, so we should continue to provide the necessary support to each child according to what each one needs.
	(KBA-MQCO-21–22) The most correct thing would be for all of us to participate in the same class, the same social space, and the same schedules (with alternatives depending on the subject). According to what the Celaa Law proposes, it seems that this is going to be modified and apparently the specific classrooms are going to be reorganized for the best inclusion of the people who need it most.
	(MRC-MQCO-19–20) All this seems great and very interesting to me, besides, I think we are doing a good job. In case you are interested I leave here the link to a recent article on the subject, published in the newspaper of Almeria.
	(GAR-MBER-20–21) Good Ana, for me, inclusive education seems very important… I also think that what I would do would be to focus more on this education, too, in cultural diversity not only in disability, this would allow us not to focus so much on the same and to know different origins, cultures, and traits of other societies.
Phase IV	(MIR-MBER-19–20) I think in the end we are getting a good job done and we are reflecting well and deeply on the issue at hand.
	(LLO-MQCO-20–21) So I think we have reached what we can consider as common ground. This issue of inclusion has to do, in a very summarized way, with attending to diversity, respecting differences, that we all have the same rights and that there is still a need for social and educational change.

5   DISCUSSION, CONCLUSIONS, AND APPROACHES

As stated above, the objectives of this study are to assess: (1) the learning, knowledge, reflections, perceptions, and opinions regarding inclusion; and (2) the level of engagement and participation in discussions among students enrolled in the subjects [MBER and MQCO] of the Pedagogy degree program at the University of Malaga, based on their participation in virtual forums during the academic years 2019–20, 2020–21, and 2021–22. Considering the proposed objectives and the analyses carried out, we highlight three aspects: students' perceptions of inclusive education, the level of involvement, reflection, and commitment of the students who have participated in the subject forum, and the learning acquired as a result of participation in the forums.

5.1   Students' perceptions of inclusive education

Although all students support the principles of IE, their interventions in the forums reveal three different perspectives regarding: (1) perceiving diversity as a limiting factor; (2) adopting paternalistic, reifying, and instrumentalized attitudes and discourses; and (3) recognizing the need for normative, terminological, and pedagogical advancements in initial teacher training while also acknowledging its limitations. In this sense, and as shown in the study by [25], the results indicate that the participating students support inclusive education. However, many of their discourses contradict this stance, as they express uncertainties and contradictions. In other words, they support inclusion due to the positive educational, social, and axiological implications associated with inclusive education.

In this regard, we find students who perceive inclusion from an individualizing perspective. They always consider the personal characteristics of the diagnosed student in terms of deficit or need. This perception of IE by students in training, which appears in numerous studies [39–40], focuses on individual differences, institutional barriers, and personalized attention [39]. It prevents the development of a comprehensive project that is the responsibility of the entire educational community, especially of the teaching staff, and involves providing educational support to all students in general [7].

Similarly, students believe that IE is feasible as long as it does not impede the overall functioning of the classroom. As in the studies by [39] and [5], in particular, the results contradict those presented by García-Fernández et al. (2013) when they associate more positive attitudes towards inclusive education with students in higher education [4th year of pedagogy].

Another concerning aspect, in which we concur with other studies [40–41], is the perceived inability reported by students to develop and advocate for inclusive practices. In this regard, they consider that they have limited competencies, skills, and methodological and organizational strategies to promote IE strategies, which aligns with [41]. In addition, they do not perceive that the training they receive at the university is practical for implementing inclusive principles in their work [7]. All these perceptions lead us to believe that it is necessary to reconsider and transform higher education, particularly in terms of inclusion. This is because students feel uncertain about applying the knowledge they have gained in their university education to real-life situations [23–24].

5.2 The degree of involvement, reflection, and commitment of the students who have participated in the subject forum

Considering the phases proposed by [32] and [31], which include initiation and clarification of the task, exploration and exchange of information and ideas, negotiation and elaboration of meanings, and co-construction and synthesis of final agreements, we can observe that throughout the entire process, students have engaged in questioning their peers, establishing priorities and timelines (Phase 1), sharing experiences and perspectives, reviewing and reflecting on previous entries (Phase 2), making well-argued contributions and seeking nuanced solutions (Phase 3), and synthesizing the information provided in the forums as requested by the teacher (Phase 4). Considering that the proposed objective is to assess the level of engagement, reflection, and commitment of the students using the proposed models, we can conclude that the students' participation in the virtual forums aligns positively with the four phases of collaborative knowledge construction.

However, the analyses show that although participation in the forums has been an evaluated task, accounting for 100% of the final grade, it has been optional. The interest of the students, on average, has been moderate (n = 58.6%). In other words, we observed an average overall participation rate among students but a high level of engagement from those who did participate [31]. In this regard, we believe that in order to promote more equitable and enriching participation, students should be provided with guidelines to increase their engagement [37–38]. Additionally, criteria of both quantitative nature (number of interventions) and qualitative (e.g., knowledge construction, feedback capacity, relevance, pertinence, expression, use of terminology, ethics) should be established for their evaluation.

5.3 Learning acquired as a result of participation in the forums

It is challenging to assess the range and amount of learning (such as conceptual, procedural, competencies, social, and attitudinal) that students acquire through their participation in the course forums. However, the replies, reflections, arguments, discussions, and exchange of information that have occurred in the forums, as well as the evidence presented, demonstrate a process of reading, understanding, analysis, information search, and synthesis. This process is reflected in the various interventions and also indicates the students' awareness and control over their learning [19].

In this regard, it is important to consider that the use of forums as a learning tool enhances students' digital and information literacy. It also improves their ability to present and defend ideas, search for information, and evaluate their value. Explaining and debating ideas in forums contributes to the creation of new knowledge [42] and promotes collaborative, reflective, and constructive learning. Additionally, it facilitates the processes of negotiation and the joint construction of meaning.

The limitations of the present study are related to the fact that the participating students are exclusively from a single degree program (pedagogy) and a single university. For this reason, it is wise to replicate this type of research with a more representative sample. Likewise, student participation is a significant element. In this respect, the research conducted in this field should analyze the external and internal factors that both restrict and encourage participation. Likewise, we agree with the author [21] that one of the challenges we must address is identifying the social and cognitive processes involved in the collaborative construction of knowledge in

virtual forums. We cannot ignore that we are immersed in contexts of ubiquitous learning [8] and expanded education [9], which necessitate considering alternative methods of building teaching and learning processes.

In short, and in line with what we have been indicating, we must recognize that university students are active agents and catalysts of change. This implies that, as teachers, we must understand their thoughts, emotions, and perceptions of the school and educational environment [42]. In this regard, it is important to acknowledge that university students play an active role in driving change. The use of forums provides us with an opportunity to create a platform for reflection where all students can participate and collectively build knowledge. Forums are an excellent tool for sharing experiences and knowledge among students and teachers. By utilizing other strategies, teachers can effectively support students' learning in online teaching and learning environments, as [10] suggests. IE is a necessary, albeit laborious, element of pedagogical education and classroom implementation.

6   REFERENCES

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