Communities of Inquiry and the Case of the "Distance Education" Group during the COVID-19 Pandemic

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Abstract — **According to the Community of Inquiry (CoI) Framework, successful learning experiences are supported by the presence and interaction of cognitive, social, and teaching elements. Since the CoI Framework has been widely used to examine the quality of educational interactions, its applicability to non-formal education has not been adequately explored. This research is a case study of the "Distance Education" group on Facebook. It was mainly carried out during a period of restrictions due to COVID-19, when most schools in Greece remained closed.**

This study explores the process by which shared understanding and learning were fostered in a Peer-to-Peer setting of teachers. Through group exploration and interaction team members were able to provide solutions and answers while focused discussion and smooth functioning were controlled by administrators who were also educators.

The results of this research show the presence of social, cognitive, and teaching elements during the discussions. Similarly, the findings of the analysis of the discussions show that they contained content directly related to the learning activities, thus indicating the presence of the cognitive component. Off-topic discussions helped develop social relationships. Overall, when interpreted within the framework of CoI, the results reveal that all three components of an effective online learning experience were present in the context of Peer-to-Peer conversations between teachers.

The most important finding is that during the pandemic, teachers had to develop reciprocal relationships and create common plans and projects that helped them overcome difficulties and, finally, reflect dialectically on the extraordinary conditions created by the pandemic. The results of the research can be used by professionals who wish to apply the framework in a non-formal educational setting.

Key words — **Adult education, Community of Inquiry (CoI), Covid-19, Distance education.**

I. INTRODUCTION

The rapid development of information and communication technologies (ICT), and the way they have affected our daily lives, make it necessary to integrate them into the educational process [1]. Many educational institutions have used the new tools, offering distance learning programs long before the COVID-19 crisis. However, in Greece the COVID-19 pandemic has led many schools to a sharp shift from conventional classroom learning to a form of synchronized distance education. In this context, teachers faced the challenge of modifying their teaching [2].

However, the evolution of ICT now enables people with common interests/goals to form communities through interaction [3], critical thinking, and quest to maximize

learning outcomes. Siemens [4] argued that the social network is the basis of learning processes and introduced the theory of connectivity. The knowledge society forces individuals to constantly update their knowledge. This cannot be achieved by accumulating knowledge, but by maintaining the connections of individuals in the social network.

Facebook is a platform that offers opportunities for the creation of such communities. The tools it provides facilitate the development of self-organized learning environments and the creation of groups of people who want to interact and learn collaboratively about a specific topic, without the need for the participation of a teacher-specialist [5]. They interact through discussions and live chats for questions and answers and can post videos or exchange files without space and time constraints. These groups can function as a mechanism of empowerment [5], mutual support, and interaction. Members can be students, educators, researchers, professionals, trainees, and experts with a common interest in a particular field of knowledge. In this way, these digital communities can support learning.

In addition to the advantages that these new tools offer, there are also a few disadvantages. To participate in digital learning communities, technological equipment, and the knowledge of how to use it are necessary. As much as technology has spread in everyday life, it cannot be taken for granted that everyone has the same access. In distance education, in addition to distance, a psychological and communication gap is created between students and educators [6].

The CoI Framework [7] which is a theoretical framework for digital and blended learning, tends to close this gap by creating a sense of community, collaboration, and interaction while promoting critical thinking in digital environments. In Communities of Inquiry, learning arises through the interaction of the three basic elements: cognitive, social, and teaching presence.

Many studies have been conducted to check the validity of this framework [8]–[11]. Studies have also been conducted on its application in digital learning environments [12], [13].

Within the theoretical framework of the CoI [8], a successful educational experience is considered to involve the interaction of the elements of cognitive, social, and teaching presence. This paper investigates how a group of teachers, through discussions, sought solutions to the problems that arose when schools were forced to provide distance education due to the COVID-19 pandemic.

Both quantitative and qualitative content analyzes were used for this research. Through qualitative analysis, the indicators were found that showed the three presences. This process served to answer the research question: How did the

CoI elements manifest in a self-organized learning community without an instructor? Using quantitative analysis, the frequency of occurrence of the three appearances was recorded. The results show that although statistically social and cognitive presences dominated, teaching presence was also strong, but provided differently.

II. Theoretical Framework

The CoI Framework is dynamic and adapted to modern learning requirements. It was designed to be able to define, describe and evaluate data related to digital learning communities [14]. Through this model, the processes are identified, but also the behaviors required for the construction of knowledge in digital environments, through the three forms of presence [7]. The members of a CoI, through dynamic interactions develop the community's critical thinking and achieve cognitive and learning goals [8]. Through collaboration and interaction, new knowledge is built [13]. The interactions are achieved through the interweaving of the three elements of the model which, through the mediation of technological means, create the educational experience [8].

This framework is influenced and based on the theory of constructivism as expressed by Vygotsky [15]. It combines the social dimension that already existed within the concept of community with the creation of a digital or blended learning environment [16]. Shea and Bidjerano [15] note that the CoI Framework has a dialogic pedagogical approach in which text-based interaction is the means for the construction of new knowledge through collaboration.

Presence is a concept used to shed light on how interactions take place in digital learning environments [17]. In the CoI Framework, each presence can be seen as a circle, which overlaps in part with the other presences and the center of all circles represents the overall learning experience.

Social presence refers to the promotion of the personal characteristics of the participants in the community [7]. Social presence is inextricably linked to emotional expression, open communication, and group cohesion [18]. In digital environments it allows participants to build relationships based on mutual trust, and to seek knowledge [19]. Defining an appropriate learning environment improves the experience as well as the level of learning [7], [18]. In other words, students' cooperation for a common goal, as well as open communication, increases the feeling of camaraderie, as well as students' satisfaction levels, and contributes to a learning experience of a higher quality. Social presence is mainly found in three types of behavior [18]. The first type is the expression of emotions. This includes members' trust in the group and their ability to express feelings about their experience of participating in the community. Indicators for recognizing this type are the use of humor, emoticons, and an eagerness for personal discussions. The second type is open communication, that is, mutual and respectful communication in the team. Indicators are mutual support, but also the strengthening of effort and the recognition of the contribution of others. The third type, group cohesion, is achieved through common purpose, a sense of belonging, but also empathy among the members.

Social presence creates the conditions for qualitative and substantial interaction and in-depth exploration while creating the basis for a meaningful collaborative framework. Social presence helps participants form trusting relationships and this has a positive effect on learning [20], [21]. The absence of social presence can lead to a high level of frustration, an unreasonably critical attitude towards the teacher's effectiveness, as well as a low level of emotional learning [22].

Cognitive presence is the ability of participants to create and construct meaning through constant communication or individual thinking [8], [23]. The construction of knowledge is achieved through a cyclical process, where after a triggering event, the learner starts to explore. Students focus on specific issues or problems and through interaction and critical thinking, construct meanings and find solutions and answers. The active participation of students, both individually and in groups, is what will bring higher levels of cognitive presence [18], but also a better learning experience. The role of the "expert", whether he is a teacher or not, is very important, because he is the one who lays the foundations [18] for the development and support of cognitive presence through the definition of the goal of the community, through organizing the content and facilitating the interaction of the participants.

Teaching presence has to do with the organization, planning, guidance, and facilitation of dialogue during the learning process [8]. Teaching presence seeks not only to facilitate the process, but also to create metacognitive skills through the guidance of the learning process [18]. It requires planning, management, knowledge of the subject and the development of a positive social climate to enable active and successful learning [24]. According to Garrison and Arbaugh [16], teaching presence is crucial for the group because it determines the content, but also coordinates, creating a sense of community. For this reason, community members should always be aware of the goals [16], but also the rules of the community.

III. Literature Review

Whether social media and Facebook in particular, can be used to support educational activities has been questioned several times [33], [34]. A study by Keles [35] on Facebook, states that teaching presence and certainly social presence can be found within these groups. Moreover, online discussions are short and to the point, so participants feel comfortable speaking in online chats [36].

Research on informal learning using social media shows that participation in social media involves many elements of social learning [37]. Schroeder *et al*. [38] mention potential issues that may arise when using social media in higher education. These include concerns about the workload for faculty and students, the lack of trust in peer feedback, ownership issues regarding public and collaborative spaces, difficulty in customizing publicly available tools, and difficulty in protecting anonymity. Öztürk [39], notes the important relationship between cognitive, social, and teaching presence. The appearance of the three presences [39] indicates that Facebook is not only a medium oriented towards social relations, but is suitable for learning,

discussion, collaboration, and critical thinking. Many studies also show that Facebook is an effective environment for learning as well [40], [41] that creates a strong social presence, fostering a sense of community and student satisfaction and is also discussion-oriented [37].

Manousou *et al.* [42] studied a CoI created by members of staff of the Hellenic Open University. The purpose of their research was to critically reflect on concepts of distance education and the collaboration of a group of staff members to correlate the group with the concept of guidance and the models of Community of Practice and CoI. The benefits observed from the development of the group can be categorized into two levels. The group became a common framework of reference for a large portion of students, but at the same time provided fertile ground for the professional development of the tutors through collaboration, interaction, mutual support, and the exchange of information and views. The group can be considered a CoI and was created to solve specific technical problems. Also, although the development of knowledge was not the main goal of the group, the members developed new knowledge through interaction, reflection, exchange of ideas, application of new knowledge, and joint projects. Social presence was high, as there was a pleasant atmosphere, encouragement, solidarity, and freedom of expression. Their study examined the group from the context of Communities of Practice and Inquiry and pointed out that "attempts to theorize real-life actions, acts, and phenomena often stumble upon the problem of defining a phenomenon." The same difficulty was encountered in the present study where, while the parameters were met, no professor was present.

In research conducted by Küçük and Şahin [43] there were two groups of undergraduate students in the Computer and Instructional Technology Education Program. The main purpose of the study was to compare the motivation, satisfaction, and academic success of students, as well as the three presences, in a group that attended class exclusively in person and in a group that participated in a blended learning class. The control group only participated in person, while the experimental group also participated in a closed Facebook group, where they exchanged resources, had discussions, and carried out group activities. The two groups had no significant difference in academic success, while the control group excelled in learning effectiveness. Nevertheless, the cohesion of the experimental group was significantly higher than in the control group, as well as the levels of exploration of the students. The study confirmed that in Communities of Inquiry group cohesion increases, but also higher levels of exploration are achieved. Group cohesion is a category of social presence, while exploration is a category of cognitive presence.

Morueta *et al.* [44] carried out research with students of different fields, from different universities, who attended classes through an LMS (Learning Management System) environment and participated in discussion forums. The research aimed to examine the link between cognitive and social presence of groups and how they relate to tasks of different levels. A strong correlation was found between cognitive and social presence, which might have been due to the interaction, the positive atmosphere, and the exchange of views between the members. Participants' social participation and expression increased as the requirements of the program increased. The correlation between social and cognitive presence coincided with the results of other studies on synchronous distance education [45], but also asynchronous [14].

The selection, planning, and facilitation of activities are key components of the teaching presence and critical to the appearance of all three presences [45]. Morueta *et al.* [44], suggest that it is the responsibility of educators to design and integrate both cognitive and social presence through coaching (30:124). Their study is very important because it reveals the importance of teaching presence and the connection of the three presences for the functioning of a community.

Rousaki and Costas [46] attempted to outline the perceptions and intentions of current teachers about social software, but also to capture current reality. The research sample consisted of four practicing teachers of different ages, familiar with the use of social software. They concluded that for a successful Community of Practice there must be a defined purpose, knowledge, and familiarity with the technology used, the team must have members from different backgrounds, there must be strong leadership, the team must have long-term goals, participation in the community must be supported, learning must be authentic, thinking and reflection cultivated, appropriate assistance provided to members, while distance and isolation must be reduced. The researchers note that social software could be used in Greek universities to create a dynamic community. The participating teachers had a positive attitude towards the CoI Framework although they expressed concern about whether it can be adopted by the Greek system of education. The willingness of teachers, but also the processes of familiarization and facilitation of knowledge were important for the optimal functioning of the CoI. The fact that teachers, although concerned, adopted a positive attitude towards the framework should be taken seriously since several studies have shown that most students are familiar with and participate in social networking platforms [47],[48], while these platforms are an integral part of student life [49].

Scott *et al.* [48] conducted a study to identify how much, but also what kind of participation was developed in a CoI with postgraduate students in a social network, in the context of informal learning. The results of their research show that although the CoI Framework is based on the interconnectedness of the cognitive, social, and teaching presence, in informal learning Communities teaching presence may not be necessary to be provided by a teacher. According to their research, Enterprise social networks can support informal learning, even when the location of the community is unclear. However, teaching presence can be provided by group administrators who offer support, encouragement, and help to members, while at the same time coordinating and managing the community. A CoI can facilitate the exchange of ideas, interaction. It can also help members to become familiar with the tools and features of Web 2.0. In addition, through such networks, learning happens in a social context and is more autonomous, based on the needs of members [49], [50]. Chunngam *et al.* [51] note that "while informal learning has a centuries-old

tradition, it has only recently been able to benefit from the use of ICT", while informal professional learning communities could be a good area for research on practices, that can be applied to adult education.

Haythornthwaite *et al*. [53] researched Reddit, to investigate the patterns, practices, and differences that exist in different digital informal learning environments. The communities surveyed were AskScience, Ask_Politics, AskAcademia , and AskHistorians . The researchers used the CoI Framework. For teaching presence, they looked at the role of the moderators, because they were the ones responsible for setting the group rules, but also the codes of conduct. These elements contributed to shaping the wider learning climate of the online community while playing an important role, both for the content being developed (the role of the expert) and for the cohesion of the team (through coordination). Through Reddit, members asked questions and raised issues where, through interaction and guidance from members who have more experience in specific issues, new knowledge was constructed. The most experienced members took on the role of the teacher. Cognitive presence could be seen with continuous contributions and explanations under posts. In this way, a topic was developed more extensively, and members were actively involved in learning. Social presence was seen through members' willingness to socialize. Greenhow and Robelia, [54] agree that social media and online discussion sites such as Reddit play a critical role in lifelong informal learning, while Rosé and Ferschke [55] point out that open online courses and discussion forums provide a way for students to get in touch with peers from around the world. Despite the technological differences of digital media, in the above cases, the main purpose was to facilitate social interactions and informal learning, while teaching presence could be seen by the way the group was moderated.

Kumar *et al*. [56] conducted a study from 2007 to 2010 at the University of Florida, where an effort was made to strengthen the education doctorate (EdD). The program created as part of the research combined the vision of professional practice with a CoI that provided online courses, promoted conferences, and encouraged interactions. To encourage the students to communicate with each other outside of the courses, a group was set up, which served as a repository for resources, a discussion forum, and a virtual space where members could interact. Members of the staff were present and active in the group. Questionnaires were answered by 16 doctoral candidates. They expressed their satisfaction with social presence, while they expressed high satisfaction with the asynchronous communication in the courses, but also with the synchronous communication during the sessions. The CoI Framework can be applied to similar programs. The application of the framework develops critical thinking, metacognition, creativity, clarity of expression in both written and oral speech, a positive attitude towards lifelong learning, and professionalism, if the members are actively involved. Studies show that high levels of social presence are related to student satisfaction [12], [57]. While higher social presence is not directly related to increased levels of knowledge or academic achievement, it nevertheless influences them indirectly, through greater student interaction [57], [58]. Thus, social presence is very important for both cognitive goals and the overall functioning of the team.

IV. PURPOSE – OBJECTIVES – RESEARCH QUESTIONS

For the present research, the CoI Framework was examined through a bibliographic review, while an attempt was made to examine through this framework the case of the Greek Distance Education Facebook Group that was created to offer support to teachers in e-learning and ICT at a time when Greek schools were operating remotely due to the COVID-19 pandemic.

Scott *et al*. [48] suggest that teaching presence can be provided by community administrators, who offer support, encouragement, and assistance to members, while also coordinating and managing the community. Also, in this community teaching presence was provided by users who, through their experience, responded as "experts" on various discussion topics [53]. The research of this group was carried out with the aim of better understanding the CoI Framework in peer Facebook groups with educational goals. Also, this research checked how the teaching presence was provided.

The research question was: How did the CoI elements manifest in a self-organized learning community without an instructor?

This group was selected as a case study as it includes the elements of the CoI Framework, but also because it is a digital group, with a clear cognitive goal.

V. METHODOLOGICAL FRAMEWORK

In the first part of the present study, a literature review was conducted on the CoI Framework as proposed by Garrison, Anderson, and Archer [7].

In the second part, a case study was conducted on the Greek Facebook "Distance Education" Group. This method was chosen because it provides the possibility of an in-depth review of a case [59] and allows a better understanding of complex phenomena as well as an in-depth observation of cases in authentic conditions.

The activity of the group was saved, organized, and analyzed with the help of Microsoft Office Excel. Major challenges in the process of collecting and saving the data were the fact that the order of the posts and reactions on the Facebook group was constantly changing and that new reactions and comments were added to the posts after the period studied, making the checking of the data extremely difficult. The posts were many each day and a discussion began under most posts. The 2265 posts from 9 March 2021 to 7 May 2021 were saved. All the posts and comments that existed below the original posts were also saved and studied so the three presences could be identified through the categories and indicators proposed by Garrison and Arbaugh [19]. The posts and comments were registered and studied with code. No names and personal data were registered, to protect the privacy of the members. Both quantitative and qualitative content analyzes were performed. Through qualitative analysis, indicators of the three presences were recorded. This process served to answer the research

questions. Using quantitative analysis, the frequency of occurrence of the three appearances was recorded.

The data were first organized into three main categories: activity, posts, and conversations. The activity was then organized into the subcategories: like, love, haha, wow, sad, angry, care, posts, and comments. Subcategories of the posts and conversations were the indicators of the three presences: "Emotions", "Encouragement of collaboration", "Risk-free expression", "Sense of puzzlement", "Exchange of information", "Connecting ideas", "Applying new ideas", "Setting curriculum and methods", "Sharing personal meaning", "Focusing on the discussion". Through these, social, cognitive, and teaching presences were identified.

VI. DATA ANALYSIS AND PRESENTATION OF RESULTS

A. Quantitative Analysis of the Posts of the "Distance Education" Group

A brief analysis of the group statistics during the study period showed that in March 2021 the group consisted of 44,310 members, while each week about 350 new members were added. The group posted approximately 42 posts a day and many comments under most posts, while there were 1,544 posts in the month of April by either team members or administrators. Most posts were made by members rather than administrators.

TABLE I: ACTIVITY OF THE "DISTANCE EDUCATION" GROUP

Participants	Posts	Posts%	Comments	comments%
Administrators	157	7%	2 985	9.1%
Members	2108	93%	2 9828	90.90%
Total	2265	100%	32786	100%

Fig. 1 shows the activity of the group studied. Under most of the posts, a dialogue developed in which several members participated. The frequent use of emojis shows that social presence in the group developed strongly. The use of the emoji " haha " was 7% of all group activities. This shows that group members expressed themselves without fear and confirms the existence of social presence.
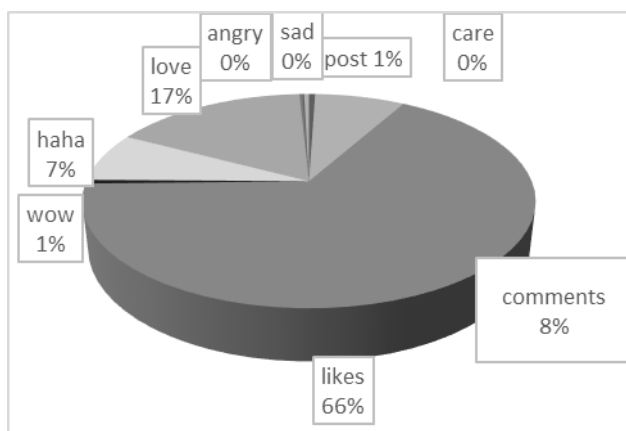

Fig. 1. Activity of the "Distance education" group.

Social presence, teaching presence, and cognitive presence were identified in the form of interactions through discussions in the Distance Education group.

Most of the posts were questions related to technical issues and problems that teachers faced. These posts indicated cognitive presence. A fairly large percentage of the posts were resources created by members, who shared them to either be used by other teachers or to be used as an inspiration for additional resources. These posts indicated both social presence , as they aimed to encourage collaboration, as well as cognitive presence since, through the creation and exchange of resources, ideas were connected and new ideas were applied.
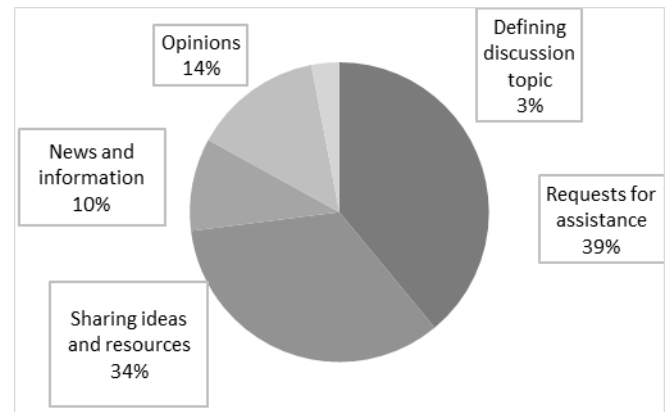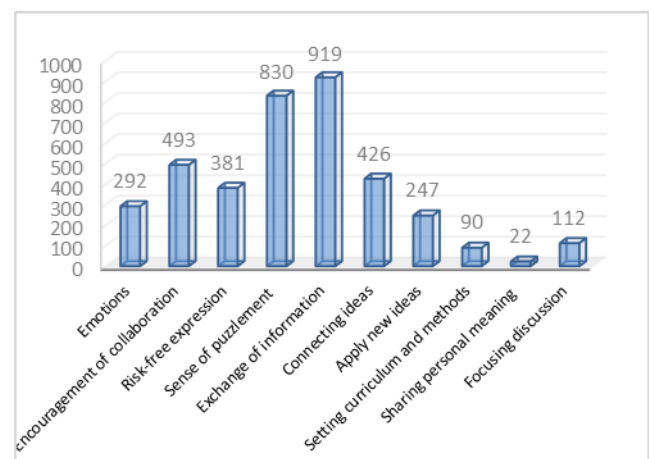

Fig. 2. Types of posts.

Fig. 3. Frequency of occurrence of the indicators of the three presences.

TABLE II: NUMBERS OF OCCURRENCES OF THE THREE PRESENCES IN THE POSTS OF THE "DISTANCE EDUCATION" GROUP

Presences	Categories	Indicators	Posts
Social presence	Affective Expression	Emotions	292
Social presence	Open communication	Encouragement of collaboration	493
Social presence	Group cohesion	Risk-free expression	381
Cognitive presence	Triggering Event	Sense of puzzlement	830
Cognitive presence	Exploration	Exchange of information	919
Cognitive presence	Integration	Connecting ideas	426
Cognitive presence	Resolution	Applying new ideas	247
Teaching presence	Design and Organization	Setting curriculum and methods	90
Teaching presence	Facilitating Discourse	Sharing personal meaning	22
Teaching presence	Direct instruction	Focusing discussion	112

Most of the posts were related to the "Exchange of information" or were questions related to problems that teachers faced. In these two types of posts the indicators "Exchange of information" (Table II) and "Sense of puzzlement" showed Cognitive presence. Social presence also appeared very often, mainly through the indicators "Encouragement of collaboration" and "Risk-free Expression". The members worked together and expressed their views and disagreements with respect, but freely. Teaching presence appeared mainly through the indicator "Focusing discussion", as a specific topic of discussion was defined by the administrators.

TABLE III: NUMBERS OF OCCURRENCES OF THE THREE PRESENCES IN THE CONVERSATIONS OF THE "DISTANCE EDUCATION" GROUP

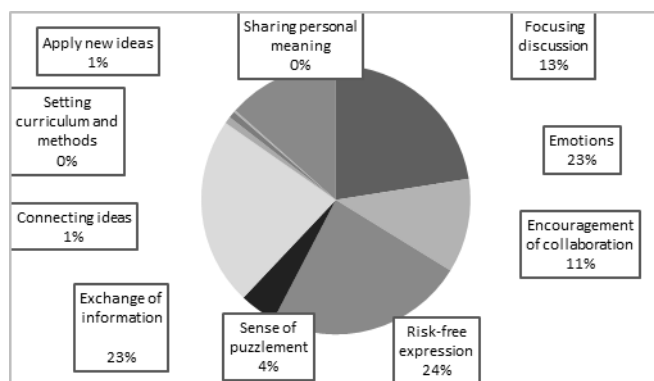| Presences	Categories	Indicators	Posts
Social presence	Affective Expression	Emotions	13836
Social presence	Open communication	Encouragement of collaboration	6952
Social presence	Group cohesion	Risk-free expression	14666
Cognitive presence	Triggering Event	Sense of puzzlement	2713
Cognitive presence	Exploration	Exchange of information	13926
Cognitive presence	Integration	Connecting ideas	516
Cognitive presence	Resolution	Applying new ideas	493
Teaching presence	Design and Organization	Setting curriculum and methods	22
Teaching presence	Facilitating Discourse	Sharing personal meaning	135
Teaching presence	Direct instruction	Focusing discussion	8253

Fig. 4. Percentage of occurrence of the indicators of the three presences in the discussions of the "Distance Education" group.

In most of the posts, indicators could be found in the categories of Social presence: Group cohesion (especially risk-free expression and emotions) and Affective expression. Cognitive presence also appeared very often in the group's posts, mainly through "Information exchange". The members collaborated and exchanged information regarding questions and concerns raised in the group. Teaching presence appeared mainly through "Focusing discussion" of the category "Direct instructions", where members answered questions "as experts", through their own experience. In most discussions, all three presences coexisted and were expressed with different indicators.

B. Qualitative Analysis of the Posts and Comments of the "Distance Education" Group

Several members seem to have developed a personal relationship with one another. Social presence was present in many of the posts and was expressed in various ways, either with a reward of some kind or with images and emojis that express emotions. In their answers, the members were supportive and promoted cooperation. In response AP110, a member praised the resources shared by a teacher. A nice atmosphere could be seen and cooperation between members, where in general, a culture of mutual aid had been created. For example, answer AP965, written for a question about attending a seminar, states: "Save my name ------ ----- and contact me in June if you cannot, so we will look into the matter." The member offered to help personally in case the other member failed to complete his/her registration. Disagreements were sometimes expressed, but always with respect. This showed that the members had developed respect but were not afraid to express themselves. This could be seen in answer AP1409, where a member, disappointed and annoyed by the training that the ministry offered, expressed frustration.

The group had not only managed to create a good atmosphere based on cooperation and solidarity among senior members, but even new members showed respect and adapted to the rules, while within the team there was a feeling that everyone belonged and could ask anything without the fear of malicious commentary. This was a central goal in the design of the group:

"We all participate in this group creating a friendly environment...disagreements are acceptable, but courtesy is essential...There are no questions more important than others to be highlighted...All the questions attract the attention of the other members in the same way." The seniority of the members that posted did not seem to affect whether a question would be answered or not.

Cognitive presence was also very strong. Members asked questions, replied to the questions of their colleagues based on their experience, and exchanged resources and information. In reply AP23, a member asked about the chat settings on Webex. It is characteristic that this question was expressed in the form of a comment and not an initial post. Most of the discussions that took place, consisted of many answers from different members. In this context, additional questions were asked and quite often the questions were answered in detail, several suggested solutions were given, and many times new ideas came up. In post 10, a topic was created with ideas for carnival creations in the classroom. Several answers had new ideas based on the resources available. Team members exchanged course materials and information daily. In answer AP56 a member stated: "I bought notability (on iPad), and it meets my needs (I am a mathematician)". This member suggested specific equipment to colleagues, based on his experience and professional needs. In response AP142 the member went one step further and connected equipment with specific applications that the team members could use.

Cognitive presence was displayed in the group in all discussions. As stated in the group's information: "We post exclusively for distance education and ICT. Understandable concerns related to the current situation, however, make it

difficult to seek/offer support. Also, no polls are shared."

Teaching presence was strong in the group, although this did not appear so much in the statistical processing of the posts. This is because the group is self-organized and outside the scope of formal training. In post 50, a member of the moderating team posted how the team had worked so far. Although it could not be seen at first sight that he was facilitating and promoting dialogue, at some point he stated "The team was helped a lot by colleagues-mentors, who from the first days supported the group with their participation, but also with the invitation, they addressed to their colleagues. Also, all the members who actively participated in the group, generously shared resources, and gave answers to their colleagues' questions or submitted their concerns, but also the members who asked questions gave meaning and reason for being in the group. Of course, the group survived and continues, thanks to the tens of thousands of members who respected its rules of procedure. ". He emphasized that respect and mutual assistance were central to the smooth running of the team and thus encouraged members to continue to do so. In post 39, a member of the moderating team wrote: "Please, for today, Friday 12/3/2021, write any problems accessing the e-learning platforms here, so there will be immediate information for colleagues that may face similar problems". These types of posts created a focused discussion and managed to offer a good picture of the problems that existed nationwide.

The following can be found in the group information:

"Posts are not approved regarding issues that have already been published once to the group, on the same day (conferences, speeches, articles, etc.). Excluding, of course, cases where the group is directly involved. "

"We do not post 'news' that has not been checked, nor anonymous or unsubstantiated articles. We preserve the credibility of the page; we respect the members." "We do not make entries in CAPITAL LETTERS, underlined, denunciatory expressions, or articles with provocative content that test the good atmosphere among our team members."

"Paid training programs related to distance learning or ICT are posted free of charge in the group once and under the condition that they will have some remuneration to the members. The promotion of paid books is prohibited."

In this way, the moderating team clearly defined the content and the rules of conduct. The achievement of these goals can be seen from the proper functioning of the team. According to the literature review, teaching presence can be provided by group moderators, who offer support, encouragement, and assistance to members, while at the same time coordinating and managing the group [48]. Also, in this group teaching presence was provided by users who through their experience responded as "experts" on various topics of discussion [53].

VII. Discussion/Analysis

A. Teaching Presence

Group members' posts and comments on those posts led to a particularly high level of interaction. The Facebook group has had a positive impact on solving teachers' issues related to distance education and to their work in general. Therefore, one of the group's goals was achieved. The posts contained texts, images, videos, animations, etc. and this contributes to a richer content [60].

According to the CoI Framework, the instructor's primary responsibility has to do with "teaching presence," but students should share some of the instructor's tasks and roles [61], [7]. The members of this group shared responsibility for the teaching process with the administrators.

The questions asked facilitated the distance education process for many teachers. This is consistent with the nature of the CoI Framework. Feedback contributed to a healthy learning process [62]. The types and contents of the resources are also very important. They should encourage exploration and enable the construction of knowledge. The way, place and context of communication have changed a lot. Education now has many tools at its disposal, and such groups could show us a lot about blended learning.

In the context of the present study, the role of administrators in facilitating topic-specific discussions played a role in the functioning of the group.

This study, however, found that the substantial interest of the participants was due not so much to the functioning of the group but to other factors as well. Deng and Tavares [63] relate online engagement to elements that are technological, individual, and based on the nature of the communities. In this group the topic was decisive in the commitment of the members, as it directly related to their work.

Therefore, this study considered the willingness of members to disseminate and share both material and solutions to the problems encountered and feedback provided by peers. Feedback provided to students is also among the elements that contribute to teaching presence [18].

B. Cognitive Presence

In this study, members' posts and comments contributed to the generation of new knowledge as Hou et al. [64] note that Facebook in particular, given its social capabilities, is an ideal environment for building knowledge through social interaction and information sharing [65].

The present study found that the number of comments under posts indicated that the group was quite active. Too many posts, irrelevant posts [66] and long discussions sometimes lead to member dissatisfaction [67]. In this group it seems that it didn't happen, the administrators were immediately deleting irrelevant posts and checking for offensive posts. This group showed great user involvement and a sense of belonging. Its operating rules were followed and adhered to by most members. However, it took a lot of work by the moderating team to prevent "inflammatory" comments and heated discussions. The group with the vigilance of the coordinating group and the cooperation of the members managed to function harmoniously and feelings of solidarity developed among its members. A sense of belonging, solidarity, member support, and participation were sought in many researchers' attempts to implement the CoI. Framework.

Information overload can quickly become a problem for

participants. The literature states that the difficulty of members to be informed on the posts is an obstacle for the development of a high-quality discussion and leads to a negative impact on cognitive presence [68]. Perhaps this can be traced to some themes being repeated.

Using Facebook for educational purposes contributes to a deeper understanding and the development of critical thinking [69]. Discussions on asynchronous posting help team members consider specific issues from different perspectives. In the present group, the discussions had a range of responses covering different perspectives.

C. Social Presence

Facebook makes communication easy. As a dynamic and active social platform, Facebook is used by many users daily [70].

The freedom felt by individuals within the Facebook group affected the risk-free expression of social presence. Facebook is by its nature a means of communication where people express their thoughts and feelings. By providing the ability to communicate with other people without time and geographical limitations [71], it strengthens the culture of virtual communication. Facebook's communication and socialization features directly contribute to the enhancement of social presence in groups that are created. Often these tools are used as a supplement to the educational process. However, there is a tendency to convert to a hybrid form where the digital coexists with and does not complement the physical world. Social media can provide a more intense social dimension, which is very important in discovery learning.

This group achieved this while all three presences coexisted, thus optimizing the overall learning experience. Although social and cognitive presence appeared to predominate, posts contained indicators of more than one presence, and all presences coexisted. As also noted by other researchers, [17], in this research each presence partially overlapped with the others and the center of all circles represented the overall learning experience.

According to the principles of educational neuroscience, quality and the effectiveness of distance education is influenced by the involvement of the students and in this case by the involvement of the members of the group. The active involvement of members and the multiple opportunities for participation strengthen the process of learning [2]. Social presence enhances member engagement and improves the overall learning experience.

The CoI Framework has not been sufficiently researched in self-organized communities and this is one of the reasons for this work. There is a need for more research on self-organized communities when applying the CoI Framework, where members operate in more spontaneous contexts, yet all three presences can be found. Examining learning processes through such groups can broaden our understanding of how learning and discussions take place outside of formal education and may ultimately enable us to transfer successful models and examples to adult distance education.

VIII. CONCLUSION

Many posts had a great response of comments and reactions from the members. This shows that the group was quite active? members were following the posts and were involved in a lively way. In the group, a sense of belonging was cultivated and so the members were not passive observers, but co-creators. Most of the posts (39%) were questions related to technical issues and problems faced by teachers. These posts indicated cognitive presence. The second most common type of posts (34%) were ideas and resources created by team members, who shared them to be used by other teachers, or as an inspiration for additional resources. These posts were part of both social presence as they aimed to encourage collaboration, as well as cognitive presence since, through the creation and exchange of resources, ideas were connected. In these two types of posts the indicators of Cognitive presence "Information exchange" and "Sense of puzzlement" could be found. Social presence also appeared very often in the group's posts, mainly through the indicators "Encouragement of collaboration" and "Risk-free Expression".

Teaching presence appeared mainly through the indicator "Focusing discussion" from posts made by the group administrators through which a specific topic of discussion was defined, but although made daily, they constituted only 3% of all posts, due to the many posts made by team members daily.

It seems that several members had developed personal relationships with others. Social presence had indicators in most of the posts and was expressed in various ways either with some reward or with images and emoji that expressed emotions. In their answers, the members were supportive and promoted cooperation. Disagreements were sometimes expressed, but always with respect. This showed that in the group there was respect, but also that the members were not afraid to express themselves.

Cognitive presence was also very strong. Members asked and answered questions based on their experience. They also exchanged resources and information. Most of the discussions that took place consisted of many answers from different members. In this context, additional questions were asked and quite often the questions were answered in detail, several suggested solutions were given, and many times new ideas came up.

Teaching presence was strong, although it did not appear so much in the statistical processing of the posts. This is because the team was self-organized and outside the scope of formal training. Teaching presence was expressed through the moderating team that had clearly defined the content, but also the rules of conduct. The achievement of these goals could be seen from the proper functioning of the team. Scott et al. [48] observed that teaching presence could be provided by the moderator who offered support, encouragement, and assistance to members, while at the same time coordinating and managing the community. In this group, teaching presence was also provided by users, who through their experience, responded as "experts" in various topics [53].

Elements of cognition, instruction, and social presence were evident in the discussions. Therefore, it could be concluded that the online learning environment, presented in

this case, includes all three elements that are considered prerequisites for a successful training experience [18].

These findings could lead to more experimentation to expand the scope of online interactions in blended adult education.

The types and contents of the resources are also very important. They should encourage exploration and enable the construction of knowledge. The way, place, and context of communication have changed a great deal. Education now has many tools at its disposal, and such groups could show us a lot about blended learning.

This group showed great involvement of users and a sense of belonging. Its operating rules were followed and respected by most members? however, it took a lot of work from the moderating team to prevent 'inflammatory' comments and heated conversations. The group, with the vigilance of the moderating team and the cooperation of the members, managed to function harmoniously, and feelings of solidarity developed among its members. The sense of belonging, solidarity, support of the members, and participation, was sought in many attempts of researchers to apply the CoI Framework. This group achieved them, while at the same time all three presences coexisted, thus optimizing the overall learning experience. Although it seemed that social and cognitive presence dominated, the posts contained indicators for more than one presence and all the presences coexisted. As also noted by other researchers, [17], in this research each presence overlapped in part with the others, and the center of all circles represented the overall learning experience.

The CoI Framework has not been sufficiently researched in self-organized communities and this is one of the reasons for the present paper There is a need for more research on self-organized communities when the CoI Framework is applied, where members operate in more spontaneous contexts, however, all three presences can be found. Examining learning processes through such groups can broaden our understanding of how learning and discussions take place outside of formal education and ultimately can enable us to transfer successful patterns and examples in adult distance education.

IX. LIMITATIONS

Although the current study hopefully provides some insight, there are a few limitations that should be considered. First, the sample size was small. Second, the research was carried out during the lockdowns due to the COVID-19 pandemic, when many teachers were looking for ways to solve the problems that arose due to the extraordinary use of distance learning. A similar study with more groups over a longer period may suggest different results. Nevertheless, this study was conducted in Greece and concerned the construction of knowledge in peer groups and can be taken as evidence that suggests the need for more research on learning within specific groups.

CONFLICT OF INTEREST

Author declares that she does not have any conflict of interest.

REFERENCES

[1] Tondeur J, van Braak J, Valcke M. Curricula and the use of ICT in education: Two worlds apart? *Br J Educ Technol* [Internet]. 2007;38(6):962–76. Available from: http://dx.doi.org/10.1111/j.1467-8535.2006.00680.x.

[2] Doukakis S, Sfyris P, Niari M, Alexopoulos E. Exploring educational practices in emergency remote teaching. The role of educational neuroscience. In: *2021 IEEE Global Engineering Education Conference* (EDUCON). IEEE; 2021. p. 1026–34.

[3] Kavoura T, The use of facebook by museums in greece before after and during the coronavirus pandemic. 2022 volume 1-A [Internet]. Sdct-journal.com. [cited 2022 Oct 5]. Available from: http://sdct-journal.com/index.php/2015-10-18-22-23-19/2021-volume-1-ab-2.

[4] Siemens G. Connectivism: A learning theory for the digital age [Internet]. Typepad.com. 2005 [cited 2022 Jul 13]. Available from: https://jotamac.typepad.com/jotamacs_weblog/files/Connectivism.pdf

[5] Mathiasen H. Students ' use of social software in self-organized learning environments [Internet]. Elte.hu. [cited 2022 Jul 13]. Available from: http://matchsz.inf.elte.hu/tt/docs/MathiasenHelleChristianDalsgaard.pdf.

[6] Moore MG. The theory of transactional distance. In: *Handbook of Distance Education*. Fourth edition. | New York: Routledge, 2019. | Previous edition: 2013.: Routledge; 2018. p. 32–46.

[7] Garrison DR, Anderson T, Archer W. Critical inquiry in a text- based environment: *Computer conferencing in higher education* 1 [Internet]. Athabascau.ca. [cited 2022 Jul 13]. Available from: https://auspace.athabascau.ca/bitstream/handle/2149/739/?sequence=1

[8] Garrison DR, Anderson T, Archer W. Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education* [Internet]. 2001;15(1):7–23. Available from: http://dx.doi.org/10.1080/08923640109527071.

[9] Rourke L, Anderson T. Validity in quantitative content analysis. Educ Technol Res Dev [Internet]. 2004 [cited 2022 Jul 13];52(1):5–18. Available from: https://www.semanticscholar.org/paper/50240c32420328e877a81d0e9d9ac32527248966.

[10] Arbaugh JB, Cleveland - Innes M, Diaz SR, Garrison DR, Ice P, Richardson JC, *et al.* Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi -institutional sample. *Internet High Educ* [Internet]. 2008 [cited 2022 Jul 13];11(3–4):133–6. Available from: https://www.learntechlib.org/p/102586/.

[11] Factorial Validity and reliability of the sense of community in online courses scale. *Journal of interactive online learning* [Internet]. Ncolr.org. [cited 2022 Jul 13]. Available from: https://www.ncolr.org/issues/jiol/v12/n2/2.html.

[12] Akyol Z, Garrison DR. The development of a Community of Inquiry over time in an online course: Understanding the progression and integration of social, cognitive and teaching presence. *Online learn*

[Internet]. 2008 [cited 2022 Jul 13];12(3):3–22. Available from: http://files.eric.ed.gov/fulltext/EJ837483.pdf.

[13] Lambert JL, Fisher JL. Community of Inquiry framework: Establishing community in an online course [Internet]. Ncolr.org. [cited 2022 Jul 14]. Available from: http://www.ncolr.org/jiol/issues/pdf/12.1.1.pdf.

[14] Swan K, Garrison DR, Richardson JC. A constructivist approach to online learning: The Community of Inquiry framework. In: *Information Technology and Constructivism in Higher Education. IGI Global*? 2009. p. 43–57.

[15] Shea P, Bidjerano T. Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of a communities of inquiry in online and blended learning environments. *Comput Educ* [Internet]. 2010;55(4):1721–31. Available from: https://www.sciencedirect.com/science/article/pii/S0360131510002095.

[16] Tolu AT. Creating effective communities of inquiry in online courses. *Procedia Soc Behav Sci* [Internet]. 2013;70: 1049–55. Available from: https://www.sciencedirect.com/science/article/pii/S1877042813001584.

[17] Saadatmand M. Examining learners ' interaction in an open online course through the community of inquiry framework. Mohsen Saadatmand *et al* [Internet]. Eric.ed.gov. [cited 2022 Jul 14]. Available from: https://files.eric.ed.gov/fulltext/EJ1187832.pdf.

[18] Garrison DR, Arbaugh JB. Researching the community of inquiry framework: Review, issues, and future directions. *Internet High Educ* [Internet]. 2007;10(3):157–72. Available from: http://reinventnet.org/moodle/pluginfile.php/1196/mod_resource/content/3/COIreview.pdf.

[19] Lin V, Kang YC, Liu GZ, Lin W. Participants ' experiences and interactions on Facebook group in an EFL course in Taiwan. *Asia-Pac educ res* [Internet]. 2016;25(1):99–109. Available from: http://dx.doi.org/10.1007/s40299-015-0239-0.

[20] Lin, V., Kang, Y.-C., Liu, G.-Z., & Lin, W. (2016). Participants ' experiences and interactions on Facebook group in an EFL course in Taiwan. *The Asia-Pacific Education Researcher*, 25(1), 99–109. https://doi.org/10.1007/s40299-015-0239-0.

[21] Sung E, Mayer RE. Five facets of social presence in online distance education. *Comput Human Behav* [Internet]. 2012;28(5):1738–47. Available from: https://www.sciencedirect.com/science/article/pii/S0747563212001185.

[22] Wei CW, Chen NS, Kinshuk. A model for social presence in online classrooms. *Educ Technol Res Dev* [Internet]. 2012;60(3):529–45. Available from: http://dx.doi.org/10.1007/s11423-012-9234-9.

[23] Capra T. Online education from the perspective of community college students within the community of inquiry paradigm. *Community coll j res practice* [Internet]. 2014;38(2–3):108–21. Available from: http://dx.doi.org/10.1080/10668926.2014.851949.

[24] Anderson T, Rourke L, Garrison R, Archer W. Assessing teaching presence in a computer conferencing context. Online learn [Internet]. 2019 [cited 2022 Jul 14];5(2). Available from: https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1875.

[25] Garrison DR, Anderson T, Archer W. The first decade of the community of inquiry framework: A retrospective. *Internet High Educ* [Internet]. 2010;13(1–2):5–9. Available from: https://www.sciencedirect.com/science/article/pii/S1096751609000608.

[26] Murphy KL, Collins MP. Communication Conventions in Instructional Electronic Chats. *First Monday* [Internet]. 1997 [cited 2022 Jul 13];2(11). Available from: https://firstmonday.org/ojs/index.php/fm/article/view/558.

[27] Palloff RM, Pratt K. *The virtual student: A profile and guide that working with online learners*. London, England: Jossey -Bass; 2003.

[28] Lapadat JC. Written interaction: A key component in online learning. *J Comput Mediat Commun* [Internet]. 2006 [cited 2022 Jul 13];7(4):0–0. Available from: https://academic.oup.com/jcmc/article/7/4/JCMC742/4584264?login=true.

[29] Dykes ME, Schwier RA. Content and community redux: Instructor and student interpretations of online communication in a graduate seminar. *Can J Learn Technol* [Internet]. 2003 [cited 2022 Jul 13];29(2). Available from: https://www.learntechlib.org/p/43047/.

[30] Warschauer M. Comparing face- to -face and electronic discussion in the second language classroom. CALICO j [Internet]. 2013 [cited 2022 Jul 14];13(2–3):7–26. Available from: https://education.uci.edu/uploads/7/2/7/6/72769947/comparing_face-to-face_and_electronic_discussion.pdf.

[31] Chou CC. A comparative content analysis of student interaction in synchronous and asynchronous learning networks. In: Proceedings of the 35th Annual Hawaii International Conference on System Sciences. *IEEE Comput. Soc*; 2003. p. 1795–803.

[32] Duemer L, Fontenot D, Gumfory K, Kallus M, Larsen J, Schafer S, *et al*. The use of online synchronous discussion groups that enhance community formation and professional identity development [Internet]. Ncolr.org. [cited 2022 Jul 13]. Available from: https://www.ncolr.org/jiol/issues/pdf/1.2.4.pdf.

[33] Donlan L. Exploring the views of students on the use of Facebook in university teaching and learning. *J Furth High Educ* [Internet]. 2014;38(4):572–88. Available from: http://dx.doi.org/10.1080/0309877x.2012.726973

[34] Roblyer, MD, McDaniel, M., Webb, M., Herman, J., & Witty, JV (2010). Findings on Facebook in higher education: A comparison of college faculty and students uses and perceptions of social networking sites. *Internet and Higher Education*, 13, 134e140.

[35] Keles E. Use of Facebook for the Community Services Practices course: Community of inquiry as a theoretical framework. *Comput Educ* [Internet]. 2018;116: 203–24. Available from: https://www.sciencedirect.com/science/article/pii/S0360131517302075.

[36] Warner AG. Developing a community of inquiry in a face- to -face class: How an online learning framework can enrich traditional classroom practice. *J Manag Educ* [Internet]. 2016;40(4):432–52. Available from: http://dx.doi.org/10.1177/1052562916629515.

[37] Greenhow C, Robelia B, Hughes JE. Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educ Res* [Internet]. 2009;38(4):246–59. Available from: http://dx.doi.org/10.3102/0013189x09336671.

[38] Schroeder A, Minocha S, Schneider C. The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning: Implications of social software use. *J Comput Assist Learn* [Internet]. 2010;26(3):159–74. Available from: http://dx.doi.org/10.1111/j.1365-2729.2010.00347.x

[39] Öztürk E. Facebook as a new Community of inquiry environment: An investigation in terms of academic achievement and motivation. *J Balt Sci Educ* [Internet]. 2015;14(1):20–33. Available from: https://www.proquest.com/docview/2344376227?pq-origsite=gscholar&fromopenview=true.

[40] Mazer JP, Murphy RE, Simonds CJ. I'll see you on "Facebook": The effects of computer -mediated teacher self-disclosure on students motivation, affective learning, and classroom climate. *Commun Educ* [Internet]. 2007;56(1):1–17. Available from: http://dx.doi.org/10.1080/03634520601009710.

[41] English R, Howell J. Facebook goes to College: Using social networking tools to support students undertaking teaching practicum. *Journal of Online Learning and Teaching* [Internet]. 2008 [cited 2022 Oct 5];4(4):596–601. Available from: https://acuresearchbank.acu.edu.au/item/8v31x/facebook-goes-to-college-using-social-networking-tools-to-support-students-undertaking-teaching-practicum.

[42] Manousou A, Giosos, Mavroidis and Koutsoumba M. Utilization of mentoring processes, communities of practice and communities of inquiry in distance education. Case studies among members of tutors-counselors of HOU. *7th International Conference in Open & Distance Learning – November* 2013, Athens, Greece – PROCEEDINGS [Internet]. 2016 [cited 2022 Jul 14];7(1A). Available from: https://eproceedings.epublishing.ekt.gr/index.php/openedu/article/view/530.

[43] Kucuk S, Sahin I. From the perspective of Community of Inquiry Framework: An examination of Facebook uses by pre-service teachers as a learning environment. 2013 [cited 2022 Jul 14]; Available from: https://www.semanticscholar.org/paper/42f780200fa1c5f932e5fbd2c16c5863a2878009.

[44] Tirado Morueta R, Maraver López P, Hernando Gómez Á, Harris VW. Exploring social and cognitive presences in communities of inquiry to perform higher cognitive tasks. *Internet High Educ* [Internet]. 2016;31: 122–31. Available from: http://www.uhu.es/angel.hernando/documentos/2016_Internet_and_higuer_education.pdf.

[45] Wanstreet CE, Stein DS. Presence over time in synchronous communities of inquiry. *Am J Distance Educ* [Internet]. 2011;25(3):162–77. Available from: http://dx.doi.org/10.1080/08923647.2011.590062.

[46] Rousaki F and Costas F (2016) The communities of practice as a supportive tool in the basic teachers' education. An exploratory approach that Social Software. *6th International Conference in Open*

& Distance Learning, November 2011, Loutraki, Greece – Proceedings [Internet]. 2016 [cited 2022 Jul 14];6(1A). Available from: https://eproceedings.epublishing.ekt.gr/index.php/openedu/article/view/758.

[47] Paliktzoglou V, Suhonen J. Facebook as an assisted learning tool in problem- based learning: the Bahrain case. Int j soc media interact learn environment [Internet]. 2014 [cited 2022 Jul 14];2(1):85. Available from: https://www.semanticscholar.org/paper/8bd3f27a5b9bc1522a9c8a63bef00f978b4cb575.

[48] Scott KS, Sorokti KH, Merrell JD. Learning "beyond the classroom" within an enterprise social network system. *Internet High Educ* [Internet]. 2016 [cited 2022 Jul 14];29:75–90. Available from: https://www.scholars.northwestern.edu/en/publications/learning-beyond-the-classroom-within-an-enterprise-social-network.

[49] Osgerby J, Rush D. An exploratory case study examining undergraduate accounting students ' perceptions of using Twitter as a learning support tool. *Int J Manag Educ* [Internet]. 2015;13(3):337–48. Available from: https://daneshyari.com/article/preview/357341.pdf.

[50] Dabbagh N, Kitsantas A. Personal learning environments, social media, and self-regulation learning: a natural formula for connecting formal and informal learning. Internet High Educ [Internet]. 2012;15(1):3–8. Available from: https://www.sciencedirect.com/science/article/pii/S1096751611000467.

[51] Ellison NB, Gibbs JL, Weber MS. The use of enterprise social network sites for knowledge sharing in distributed organizations: The role of organizational affordances. *Am Behav Sci* [Internet]. 2015;59(1):103–23. Available from: http://dx.doi.org/10.1177/0002764214540510.

[52] Chunngam B, Chanchalor S, Murphy E. Membership, participation and knowledge building in virtual communities for informal learning: Virtual communities for informal learning. *Br J Educ Technol* [Internet]. 2014;45(5):863–79. Available from: http://dx.doi.org/10.1111/bjet.12114.

[53] Haythornthwaite C, Kumar P, Gruzd A, Gilbert S, Esteve del Valle M, Paulin D. Learning in the wild: coding for learning and practice on Reddit. *Learn Media Technol* [Internet]. 2018 [cited 2022 Jul 14];43(3):219–35. Available from: https://surface.syr.edu/istpub/186/.

[54] Greenhow C, Robelia B. Old communication, new literacies: Social network sites as social learning resources. *J Comput Mediat Commun* [Internet]. 2009 [cited 2022 Jul 14];14(4):1130–61. Available from: https://academic.oup.com/jcmc/article/14/4/1130/4583570.

[55] Rosé CP, Ferschke O. Technology support for discussion based learning: From computer supported collaborative learning that the future of massive open online courses. *Int J Artif Intel Educ* [Internet]. 2016;26(2):660–78. Available from: http://dx.doi.org/10.1007/s40593-016-0107-y.

[56] Kumar S, Dawson K, Black EW, Cavanaugh C, Sessums CD. Applying the community of inquiry framework to an online professional practice doctoral program. *Int Rev Res Open Distrib Learn* [Internet]. 2011 [cited 2022 Jul 14];12(6):126. Available from: https://www.irrodl.org/index.php/irrodl/article/view/978.

[57] Richardson JC, Swan K. Examining social presence in online courses about students 'perceived learning and satisfaction. Online learn [Internet]. 2019 [cited 2022 Jul 14];7(1). Available from: https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1864.

[58] Caspi A, Blau I. Social presence in online discussion groups: testing three conceptions and their relations that perceived learning. *Soc Psychol Educ* [Internet]. 2008;11(3):323–46. Available from: https://psycnet.apa.org/fulltext/2008-08886-008.pdf.

[59] Creswell JW, Poth CN. Qualitative inquiry and research design [Internet]. SAGE Publications Inc. 2022 [cited 2022 Jul 14]. Available from: https://us.sagepub.com/en-us/nam/qualitative-inquiry-and-research-design/book246896.

[60] Pimmer C, Linxen S, Gröhbiel U. Facebook as a learning tools? A case study on the appropriation of social network sites from mobile phones in developing countries: Facebook as a learning tools? *Br J Educ Technol* [Internet]. 2012;43(5):726–38. Available from: http://dx.doi.org/10.1111/j.1467-8535.2012.01351.x.

[61] Akyol Z, Garrison DR, Ozden MY. Online and blended communities of inquiry: Exploring the developmental and perceptional differences. *Int Rev Res Open Distrib Learn* [Internet]. 2009 [cited 2022 Oct 5];10(6):65. Available from: https://www.irrodl.org/index.php/irrodl/article/view/765.

[62] Hosler KA, Arend BD. The importance of course design, feedback, and facilitation: student perceptions of the relationship between teaching presence and cognitive presence. *EMI Educ Media Int* [Internet]. 2012;49(3):217–29. Available from: http://dx.doi.org/10.1080/09523987.2012.738014

[63] Deng L, Tavares NJ. From Moodle to Facebook: Exploring students ' motivation and experiences in online communities. *Comput Educ* [Internet]. 2013;68: 167–76. Available from: https://www.sciencedirect.com/science/article/pii/S036013151300122X.

[64] Hou HT, Wang SM, Lin PC, Chang KE. Exploring the learner's knowledge construction and cognitive patterns of different asynchronous platforms: comparison of an online discussion forum and Facebook. *Innov Educ Teach Int* [Internet]. 2015;52(6):610–20. Available from: http://dx.doi.org/10.1080/14703297.2013.847381.

[65] Wang CM. Using Facebook for cross-cultural collaboration: the experience of students from Taiwan. *EMI Educ Media Int* [Internet]. 2012;49(1):63–76. Available from: http://dx.doi.org/10.1080/09523987.2012.662625.

[66] Çoklar AN. Evaluations of students on Facebook as an educational environment. *Turkish Online Journal of Qualitative Inquiry* [Internet]. 2012 [cited 2022 Oct 5];3(2):42–53. Available from: https://dergipark.org.tr/en/pub/tojqi/issue/21395/229370.

[67] O'Bannon BW, Beard JL, Britt VG. Using a Facebook group as an educational tool: Effects on students achievements. *Comput Sch* [Internet]. 2013;30(3):229–47. Available from: http://dx.doi.org/10.1080/07380569.2013.805972.

[68] Kirschner PA. Facebook as learning platform: Argumentation superhighway or dead -end street? Comput Human Behav [Internet]. 2015;53:621–5. Available from: https://www.sciencedirect.com/science/article/pii/S0747563215001971.

[69] Manca S, Ranieri M. Is it a tool suitable for learning – a critical review of the literature on Facebook as a technology-enhanced learning environment: Is Facebook a tool suitable for learning. *J Comput Assist Learn* [Internet]. 2013;29(6):487–504. Available from: http://dx.doi.org/10.1111/jcal.12007.

[70] Rap S, Blonder R. Let's face (book) it: Analyzing interactions in social network groups for chemistry learning. *J Sci Educ Technol* [Internet]. 2016;25(1):62–76. Available from: http://dx.doi.org/10.1007/s10956-015-9577-1.

[71] Pempek TA, Yermolayeva YA, Calvert SL. College students ' social networking experiences on Facebook. *J Appl Dev Psychol* [Internet]. 2009;30(3):227–38. Available from: https://www.sciencedirect.com/science/article/pii/S0193397308001408.

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