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ΓΕΩΡΓΙΑΣ ΑΡΑΠΚΟΥΛΕ

**ΑΞΙΟΛΟΓΗΣΗ ΤΗΣ ΑΜΙΓΟΥΣ ΕΞ' ΑΠΟΣΤΑΣΕΩΣ
ΕΚΠΑΙΔΕΥΣΗΣ ΕΝ ΜΕΣΩ ΤΗΣ ΠΑΝΔΗΜΙΑΣ ΤΟΥ COVID-19 ,
ΣΕ ΜΕΤΑΠΤΥΧΙΑΚΑ ΠΡΟΓΡΑΜΜΑΤΑ ΤΟΥ ΤΟΜΕΑ
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Υποβληθείσα ως μέρος των απαιτήσεων για την απόκτηση
Μεταπτυχιακού Διπλώματος (MSc) στη Διοικητική Επιστήμη και Τεχνολογία

Αθήνα, Μάρτιος 2022



Η σελίδα αυτή είναι σκόπιμα λευκή





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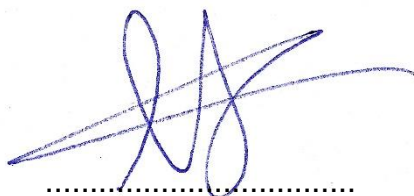
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Βεβαίωση εκπόνησης Διπλωματικής εργασίας

«Δηλώνω υπεύθυνα ότι η συγκεκριμένη μεταπτυχιακή εργασία για τη λήψη του μεταπτυχιακού τίτλου σπουδών του ΠΜΣ στη Διοικητική Επιστήμη και Τεχνολογία του Τμήματος Διοικητικής Επιστήμης και Τεχνολογίας του Οικονομικού Πανεπιστημίου Αθηνών έχει συγγραφεί από εμένα προσωπικά και δεν έχει υποβληθεί ούτε έχει εγκριθεί στο πλαίσιο κάποιου άλλου μεταπτυχιακού ή προπτυχιακού τίτλου σπουδών στην Ελλάδα ή το εξωτερικό. Η εργασία αυτή έχοντας εκπονηθεί από εμένα, αντιπροσωπεύει τις προσωπικές μου απόψεις επί του θέματος. Οι πηγές στις οποίες ανέτρεξα για την εκπόνηση της συγκεκριμένης διπλωματικής αναφέρονται στο σύνολό τους, δίνοντας πλήρεις αναφορές στους συγγραφείς, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο».

(Υπογραφή)



<ΑΡΑΠΚΟΥΛΕ ΓΕΩΡΓΙΑ>

Φοιτητής MSc στη Διοικητική Επιστήμη και Τεχνολογία



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Περίληψη

Η πανδημία Covid-19 του 2020 οδήγησε τα πανεπιστήμια σε όλο τον κόσμο σε απροσδόκητες λειτουργικές αλλαγές, καθώς αναγκάστηκαν σε πλήρως διαδικτυακό περιβάλλον μάθησης από τον Μάρτιο του 2020 έως τον Ιούνιο του 2021. Οι ερευνητές έχουν δημιουργήσει το Πλαίσιο «Κοινωνία της Γνώσης», που περιλαμβάνει τη διδακτική, την κοινωνική και τη γνωστική Παρουσία, και έχουν αντίκτυπο στην διαδικτυακή εκπαιδευτική εμπειρία και την αντιληπτή ικανοποίηση των μαθητών. Προσαρμόζοντας αυτό το πλαίσιο της Κοινωνία της Γνώσης (Community of Inquiry), η παρούσα μελέτη διερευνά την οπτική των φοιτητών για αυτούς τους τρεις παράγοντες και την ικανοποίηση που αντιλαμβάνονται οι φοιτητές κατά τη διαδικτυακή περίοδο μάθησης σε μεταπτυχιακά προγράμματα του Τμήματος Διοίκησης Επιστήμης και Τεχνολογίας του Οικονομικού Πανεπιστημίου Αθηνών. Επίσης, η μελέτη επιχειρεί να υπολογίσει τη συσχέτιση μεταξύ των παραγόντων του CoI και της ικανοποίησης των μαθητών και την πιθανή επίδραση άλλων δημογραφικών παραγόντων στη συσχέτισή τους. Τα αποτελέσματα δείχνουν ότι οι μαθητές τείνουν να είναι λιγότερο ικανοποιημένοι από τη διαδικτυακή λειτουργία σε σχέση με την προηγούμενη εμπειρία της δια ζώσης μάθησης και, επίσης, τείνουν να έχουν λιγότερο θετική αντίληψη για τη διδασκαλία και τις γνωστικές παρουσίες, σε σύγκριση με τα προηγούμενα σχολικά χρόνια. Επίσης, οι φοιτητές έχουν ουδέτερη αντίληψη για την κοινωνική παρουσία. Επιπλέον, υπολογίζεται ότι οι τρεις Παρουσίες του CoI έχουν ισχυρή συσχέτιση μεταξύ τους, ενώ η Διδακτική και η Κοινωνική παρουσία είναι σημαντικοί παράγοντες πρόβλεψης της ικανοποίησης των μαθητών. Τέλος, το φύλο και η ηλικία των μαθητών βρέθηκαν να είναι σημαντικοί παράγοντες συσχέτισης μεταξύ των Παρουσιών του CoI και της ικανοποίησης των μαθητών. Η παρούσα έρευνα υποδηλώνει ότι τα μελλοντικά διαδικτυακά προγράμματα θα πρέπει να σχεδιάζονται καλύτερα και να διευκολύνονται από τους εκπαιδευτές και οι μαθητές θα πρέπει να παροτρύνονται να συμμετέχουν και να αλληλεπιδρούν με τους άλλους συμμετέχοντες. Έτσι, το αίσθημα «ανήκειν στην τάξη» των μαθητών θα είναι πιο δυνατό και θα είναι πιο ικανοποιημένοι. Φυσικά, υπάρχουν πολλές μελλοντικές ευκαιρίες έρευνας, καθώς η ιδέα των πλήρως διαδικτυακών μεταπτυχιακών προγραμμάτων είναι υπό ανάπτυξη για την Ελλάδα. Προτείνονται σχετικές μελέτες για μεγαλύτερα δείγματα φοιτητών, αλλά και εξέταση του αντίκτυπου περισσότερων παραγόντων, όπως για παράδειγμα το είδος των μαθημάτων, οι βαθμοί των φοιτητών και άλλα αναμενόμενα αποτελέσματα των μαθημάτων. Τέλος, μια μελλοντική ερευνητική πρόταση είναι ο επανασχεδιασμός του ερωτηματολογίου του CoI, προκειμένου να αντιμετωπιστεί καλύτερα η έννοια ενός πλήρως διαδικτυακού προγράμματος, καθώς το αρχικό πλαίσιο CoI προτάθηκε για μοναδικά μαθήματα και όχι για συνολικά προγράμματα, όπως αυτά που εξετάζονται στην παρούσα έρευνα.

Λέξεις Κλειδιά: <<Κοινωνία της Γνώσης, Ικανοποίηση των μαθητών, εμπειρία εξ αποστάσεως εκπαίδευσης >>



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Abstract

Covid-19 pandemic of 2020 has led worldwide universities to unexpected operational changes, as they were forced to fully online learning environment from March 2020 until June 2021. Researchers have established three factors Framework, Teaching, Social and Cognitive presence, that have an impact on online education experience and student perceived satisfaction. Adapting this framework of Community of Inquiry, the present study investigates student perspective on these three factors and student perceived satisfaction during the online learning period on master programs of Management Science and Technology Department of Athens School of Economics and Business. Also, the study attempts to figure the correlation between CoI factors and student satisfaction and the possible impact of other demographic factors on their association. The initial CoI framework and student perceived satisfaction questionnaires were transformed in order to better express the program in total. Participants were invited through emails and personal messages in social media and collected data were statistically analyzed. Results indicate that students tend to be less satisfied from the online operation than the previous face-to-face learning experience and, also, they tend to have a less positive perception on teaching and cognitive presences, compared to previous school years and, also, neutral perception on Social presence. Furthermore, the three presences are highly correlated one each other, while Teaching and Social presence are significant student satisfaction predictors. The three presences predict 37.9% of variance. Finally, student gender and age found to be significant comparison factors between CoI presences and student satisfaction. The present research implies that future online programs should be better designed and facilitated by the instructors and students should be urged to participate and interact with the other participants. This way, the student “class belonging” feeling will be stronger and they will be more satisfied. Of course, there are plenty future research opportunities, as the concept of fully online master programs is under development for Greece. Relevant studies for larger samples are suggested, along with a better examination of impact factors, for example the effects of subject matter type, and more courses outcomes. Finally, a future research suggestion is redesigning of CoI framework questionnaire, in order to better address the concept of a fully online program, as the original CoI framework was suggested for unique courses and not for programs in total, as it is examined in the present study.

Keywords: <<CoI Framework, Community of Inquiry, Student perceived satisfaction, online educational experience, digital learning>>



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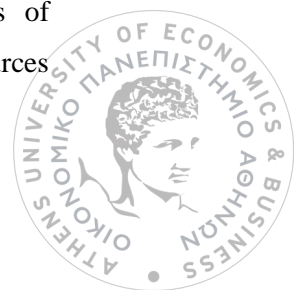
1. INTRODUCTION

The last two years, people worldwide have faced an unprecedented experience, due to the Covid-19 pandemic. Most of the countries had decided limitations to economic and academic activities, transportations and cultural events. People were practicing social distancing, even for their daily activities, like their job or education. According to UNESCO (2020) over 150 countries across the world had announced closure of educational institutions, due to the pandemic on the first quarter of 2020. As a result, universities should move to a distance learning model in a very short time, as one after the other countries were infected by Covid-19.

Worldwide, this very unexpected situation had led some employees were forced to stop providing services due to the pandemic, people to stop their hobbies, they stopped seeing their friends and family and, so, they started to feel social isolation, depression and anxiety. Referring to Greek university students, researcher from Medical School in Aristotle University of Thessaloniki (Kaparounaki, et al, 2020) found that among 1000 students the percentages of anxiety and depression were increased about 42% and 74% respectively. So, it was essential, for citizens and community's operation, people's daily activities to be continued, as much as possible. A lot of employees started working from home, doing gymnastics, see movies and theaters on websites and in general, people started communicate again each other through online platforms and communication mediums.

Despite the massive changes that were performed, the period of limitation during pandemic has to offer a unique opportunity for educational programs reconstruction, in order to fulfil the present generations' educational needs. In order for modern student needs to be addressed, authorities, universities, instructors and learners have already started to use new medium of communications and more learning appealing technics. Especially for education in Greece, universities and schools were forced to changed their operations from fully synchronous, face-to- face teaching to fully synchronous online classes. The achieved this transition in only six days and it is already applied for two academic periods, from 2020 to 2022. Additionally, the development of technology nowadays has led to the extended use of technology almost in every aspect of our lives and technological advance has changed our perspective about educational methods and affected the learning process for all the participants, as the traditional face-to-face classroom has been transformed by the use of electronic media (Prestiadi et al., 2020). Finally, as it was developed by Garrison (Garrison et al., 2000) in the Community of Inquiry Framework (CoI), inquiry environments require a community, in order to fulfill their purpose.

Considering all the above, the present research takes place among students of Management Science and Technology, Business Analytics, and Human Resources



Management Master Programs, on Athens School of Economics and Business. The purpose of the research is to investigate student perceived learning experience through the last two years fully online educational environment. Specifically, the study is focusing on the three presences, Teaching, Social and Cognitive and what are student perspectives on these presences and their perceived satisfaction. The study reports what are the effects of the unexpected transition from face-to-face to fully online educational environment on students perceived educational experience and perceived satisfaction, during the limitations due to Covid-19 pandemic. CoI framework is used to investigate the influence of teaching, social and cognitive presence on student satisfaction. Research outcomes will provide initial insights into the verification of CoI framework on a fully online educational program as total and the correlation between CoI elements and student perceived satisfaction.

The study is structured in six chapters. First Chapter is an introduction to study's matter, regarding the Covid-19 pandemic and its consequences on people daily life. Second Chapter includes relevant research in adult student digital learning theories in general and the Community on Inquiry framework, along with student perceived satisfaction. Also, in the second Chapter survey's research questions and examined hypotheses are analyzed. Chapter three consists of the followed methodology, including research context and survey's instrument development. In Chapter four, survey data analysis is presented along with relevant important tables and hypotheses examination. Survey findings, hypothesis testing and discussion are presented in fifth Chapter. In the final sixth Chapter limitations of the present survey and suggestions for further research are included, along with the conclusion of the present study. In the end of the survey there are bibliographical references and appendixes for Figures, Tables and used questionnaires.

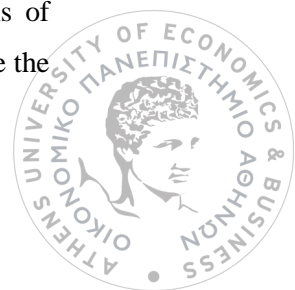


2. LITERATURE REVIEW

Nowadays, technology offers various possibilities for distance education. Synchronous and asynchronous education is a major classification for learning environments. According to Ebner and Gegenfurtner (2019), “*Synchronous learning environments enable simultaneous and direct interaction, while asynchronous learning environments afford temporally delayed and indirect interaction*”. A second classification of distance learning is the medium of delivery used in learning environments. Online environments refer to use of platforms and real-time interaction through the Internet, while the offline environments refer to traditional education with no use of digital infrastructure. (Ebner and Gegenfurtner, 2019). So, relevant to the above, education environments can be described by their synchronicity and modularity. Online classes, webinars and seminars are online and synchronous environments, with direct interaction between the participants, while using management systems for sharing educational material on platforms and servers is online, but asynchronous environment, as there is only indirect interaction between the participants.

The most common term used for online synchronous teaching is e-learning. As it is described by Aldowah *et al* (2017) “*E-learning is currently the common term used to describe the various uses of information and communications technologies to enhance learning and teaching*”. For the present research, terms of digital, online or distance learning are adopted, instead of E-Learning, in order to better explain the distance between that participants and their totally digital communication and interaction. Digital learning benefits include flexibility for students regarding participation, convenience, and customizability to students’ needs (Richardson *et al.*, 2017). As Francescucci and Rohani (2018) mentioned, lack of face-to-face (F2F) interactions between classroom participants remain a major concern of online learning. That is the reason why there are several studies regarding the effectiveness of distance learning and the learning outcomes of online classrooms. While some studies find differences in effectiveness between IT-mediated and traditional face-to-face learning environments, many studies indicate that there are no significant differences (Sarker & Nicholson, 2005).

To understand how students and faculty are affected by the distance in the learning process, it is important to understand the different learning styles and how they could be enhanced, in order to avoid distance learning’s failure. Learning styles refer to the manner in which a learner interacts, understands and processes what he is attempting to learn. There are three basic dimensions which could be use to describe the different learning styles: The first one is perceptual dimension, which explains the way that people assimilate information and it is connected with person’s biological characteristics. The second dimension is the cognitive dimension and it refers to the manner in which learners process information, in terms of remembering, problem solving and perceiving. Scientists use several categories to describe the



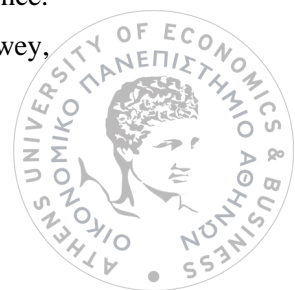
cognitive dimension, as global/analytic or left-/right-brain, but despite the categorization, it is indicated that each person has its preferred way of information process. Final dimension of learning styles is the affective dimension, which refer to personality aspects relative to valuing, attending and feeling. Conclusions regarding the affective dimension can be extracted by behavior and person's interaction with the environment (James and Gardner, 1995).

Another important factor of successful distance learning is the delivery medium, which is used for the participants to interact and communicate. Arbaugh (2002) analyses in his study the behavioral characteristics of online MBA studies. As these programs respond to graduate participants, the possibility of online communication makes these online programs more appealing to older students, because of their social obligations, like work and family. So, the medium used for the online sessions should provide to participants a satisfying level of flexibility. Furthermore, Davis (1989) introduced the technology acceptance model (TAM), which describes how students adopt the use of technology. The two aspects of TAM are: perceived ease of use and perceived usefulness. Both of them can affect user's attitude towards technology's adoption. Perceived ease of use refers to a person's attitude regarding the use of a particular system and how it could contribute to effort reduction, while perceived usefulness refers to a person's attitude regarding a system's contribution to user's performance. Conclusively, these two factors are significant for users' experience with technology and their prospective for new technologies to be adopted. In terms of online learning, TAM model can describe and predict students' intention to participate in other online courses, in the future, based on their previous experience, learning outcomes and satisfaction. (Arbaugh, 2002).

Finally, the existing of class belonging sense is also a controversial issue for online education environments. Community of Inquiry framework, introduced by Garrison et al. in 2000, consists of three core elements, Teaching, Social and Cognitive presences. It was developed in order to examine factors that affect relationships between online courses participants, instructors and learners, and how these factors could be related to online educational environments success and critical thinking development. The CoI framework was adopted by the present survey and it is analyzed below.

2.1 Community of Inquiry Framework

The Community of Inquiry framework, known as CoI, was initially introduced by Garrison et al. in 2000. The main framework purpose is to provide a tool for the use of computer-mediated communication (CMC) as the main medium used during the education experience. More specifically, the CoI framework suggests a model of community inquiry consisting of three basic elements: cognitive presence, social presence and teaching presence. In this framework, inquiry and community are the central elements supporting by John Dewey,



supporting that student individual development requires community (Swan, Garrison, & Richardson, 2009). As these elements describe the role of teachers and students during the educational process, their interaction is the key factor of a successful educational experience within the Community, as shown in Figure 1.

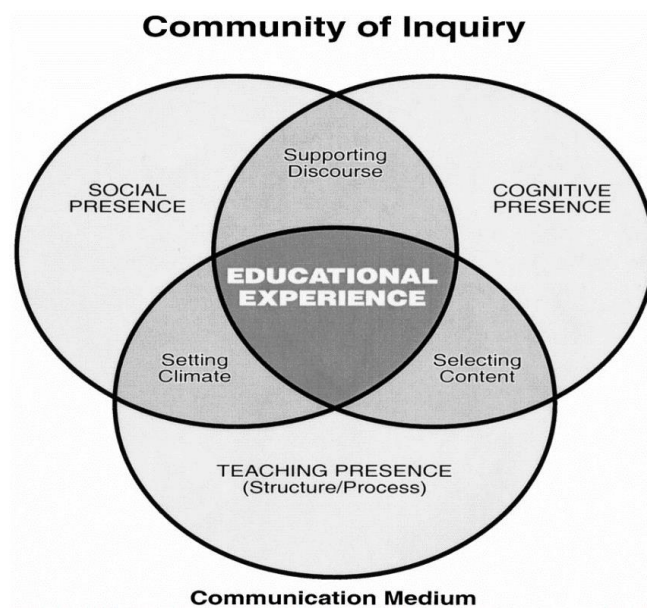


Figure 1: Elements of an educational experience (coi.athabasca.ca,2022)

Cognitive presence is the most important element of CoI, as it describes the extent to which the participants of a Community of Inquiry are able to communicate effectively during distance learning sessions and extract meaningful knowledge. Cognitive presence is vital for critical thinking development and that is the reason that makes important the analysis of this presence, for face-to-face educational environments and environments where participants communicate each other through the Internet, as in online education. (Garrison et al., 2000). According to Garrison et al. research (2001) and Practical Inquiry Model, which was developed by John Dewey, cognitive presence could be assessed through four phases: triggering event, exploration event, Integration event and resolution event.

Additionally, the second core element of the model, Social presence, describes the ability of participants to preserve their characteristics and interact with each other like in real life and their ability in the Community of Inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as "real people." Social presence element is also important for the educational experience as a support for cognitive presence, because it is indirectly facilitating the process of critical thinking development during the educational process within the community of learners. Never the less, social presence contributes directly on the success of learner education, when the interaction between the participants is vital for the success of educational process (Garrison et al., 2000).



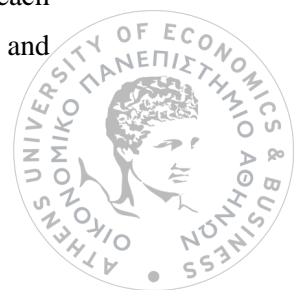
Garrison and Arbaugh (Garrison & Arbaugh, 2007) mentioned that social presence could be examined through the following three categories, affective expression, open communication and group cohesion. Also, they indicated that social presence is increased through student interaction and collaboration and that social presence is necessary for cognitive presence development.

Finally, the third element of the model, Teaching presence, refers to teacher responsibilities within any Community Inquiry. The first responsibility is the design of the educational experience, from selection and presentation of course content to development of learning activities and assessments. Teacher and instructor use to fulfil this responsibility. The second responsibility is facilitation of the experience, which could be shared among the participants, especially in the higher education. It could be conducted from the above that Teaching presence is a means for support and enhancement to social and cognitive presences, in order for the desired education purposes to be fulfilled. (Garrison et al., 2000). As it is mentioned by (Garrison & Arbaugh, 2007) that teaching presence developed based on three components, instructional design and organization, facilitating discourse and direct instruction. Also, according to several studies, indicated that teaching presence is believed as a significant factor for student satisfaction, as structure and facilitation are significant for student sense of community belonging and inquiry development.

2.2 Relevant Research

Since its introduction, CoI framework have been adopted by many researchers, in order to study student experience of online and blended educational environments (Stenbom, 2018). A lot of previous studies examined the presences of CoI framework separately: teaching presence was studied by Arbaugh & Hwang (2006), social presence by Richardson & Swan (2003), and cognitive presence by Garrison & Cleveland-Innes (2005), while other researches relied on qualitative methodologies to examine the CoI presences, like Garrison et al (2010), who conducted SEM analysis for the three presences relationships. Findings from their research indicated a significant association between teaching and social presence and teaching and cognitive presence, along with mediation effects of social presence on teaching and cognitive presences correlation. Finally, in Garrison et al. paper, it is reported that gender effect on CoI elements is a controversial issue.

According to Stenbom systematic review (Stenbom, 2018), the CoI framework was examined with two methods. The first one was via transcript messages, that had been coded and used in statistical analyses. The second method was the survey instrument, introduced by Arbaugh et al (2008). That paper proposes an instrument which consists of 34 items and each item was developed to reflect a category and an element. The instrument's reliability and



validity were tested in the establishing paper and in the follow-up study by Swan et al. (2008). Also, Shea and Bidjerano (2009) used the same CoI framework instrument. Their survey was conducted between 2159 online courses students from 30 different institutions. Shea and Bidjerano reported a high internal consistency for CoI element scales and it was hypothesized and proved that social presence mediates ratings of cognitive presence with teaching presence. Stenbom (2018) in his review regarding the CoI framework instrument mentioned the following results: From 2008 to 2018, there were more than 220 researchers that adopted CoI framework instrument. The instrument was used for both synchronous and asynchronous environments, with students in synchronous environments to have higher CoI scores. Mean of participant in previous researches were 158 students, while the instrument had been also modified to meet surveys' needs. Also, in some studies online and blended mode have been compared and it was found that blended course students had slightly higher perceptions compared to online courses students. However, the adoption of CoI framework for whole online programs seems to be rare.

2.3 Community of Inquiry framework and student satisfaction

As the delivery of distance education gains student and universities interest, a fundamental question needs to be answered: how the online programs would become more effective (Arbaugh, 2018). In some studies, the association of CoI framework and learning outcomes are examined. The majority of studies were conducted in full online settings, regarding one or more online courses, on one or more programs with different characteristics, instructors or lessons. Arbaugh (Arbaugh, 2008) investigated whether the social, cognitive, and teaching presences can predict student learning and delivery medium satisfaction in an online MBA course. The study sample was drawn from 55 online courses in one of the US Mid-Western universities, while 656 students completed the survey. The results revealed that the CoI presences were significant predictors of student learning and delivery medium satisfaction in the online MBA course, but only for the 22% of the variance in delivery medium satisfaction. Also, Cognitive presence was not a significant predictor for delivery medium satisfaction. This study concluded that the CoI is a potentially influential theoretical framework for explaining online learning effectiveness.

Another study by Joo et al. (2011) examined between 1200 learners if CoI presences and perceived technology usefulness and ease of use could predict student satisfaction, along with the relationships between these variables. Results indicated that Teaching and Cognitive presences and perceived technology usefulness and ease of use significantly predicted students' satisfaction. Social presence in this study did not predict students' satisfaction.



Another interesting study on CoI elements and their ability to predict student satisfaction is the one conducted by Giannousi and Kioumourtzoglou (2016). This research was performed among 214 undergraduate students in order to find in which extent Cognitive presence could predict student satisfaction, along with Teaching and Social presences. Arbaugh et al. (2008) CoI instrument was used for CoI elements measurements. Results indicated that CoI elements could predict 39.2% of the variance in students' satisfaction. Cognitive presence was a better predictor of students' satisfaction, compared to Teaching and Social presences.

There is a lack of research examining the relationship between the CoI framework, learning outcomes and student satisfaction, especially in fully online programs, where participants to evaluate their experience as a total. Alaulamie (2014) conducted a survey in an online program at a Saudi university, among students of 5 undergraduate programs, and he examined whether the CoI presences can predict satisfaction of 814 students. This research instrument was based on Arbaugh et al. (Arbaugh et al, 2008) CoI instrument. Student responses were used to perform the multiple regression analysis. The results indicated that social, cognitive, and teaching presences significantly predict overall student satisfaction, and that CoI presences explain 38% of the variance in student satisfaction. The results also found cognitive presence to be the larger contributor in the regression model and the better predictor of student satisfaction than social and teaching presence.

Another research that refers to a whole online program, instead of individual online courses is the survey conducted by Kumar & Ritzhaupt in 2014 (Kumar S. & Ritzhaupt A.D,2014). This survey examined 16 doctorate students of educational technology program, in the University of Florida. CoI Framework was also measured through (Arbaugh et al.,2008) instrument. Finding of Kumar & Ritzhaupt research (2014) indicated that most of the participants expressed high rates of faculty presence on a 5-Likert scale (means for every item were above 4). Similar to teaching presence, social and cognitive presences were highly rated, too. For cognitive presence, all the items had means greater than 4, on a 5-Likert scale. the majority of the students agreed that subject matter was very close to their professional goal and all the 16 students agreed that the program activities increased their interest and improved their understanding of the field of educational technology. Social presence was rated also high, with the majority of the items with means greater than 4, on a 5-Likert scale. Regarding the contribution of on-campus meetings to community sense building, only 8 students mentioned that the on-campus orientation session was valuable for building community in the cohort. Kumar and Ritzhaupt' survey implemented that CoI framework could be a useful tool for the evaluation of online programs, despite the initial scope of CoI on individual online courses.

Based on the previous studies, the present study addresses the research questions that are analyzed below.



2.4 Research Questions and Hypotheses

As mentioned before, the influence of CoI framework's three presences on student's satisfaction and relationships among these presences are analyzed in several studies. In order for the present to measure the effect of the CoI framework elements, a 34-item Community of Inquiry Framework survey instrument, developed by Arbaugh et al., (Arbaugh et al. ,2008) was used. CoI instrument had already been analyzed using factor analysis and the instrument had been tested for validity and reliability. Also, for student satisfaction measurement, Arbaugh' instrument for student perceived satisfaction was used (Arbaugh, 2018).

Furthermore, As Stefan Stenbom (2018) mentioned, over the years a lot of surveys have investigated how the presences affect each other and finally which one seems to be the most important. So, similar to previous surveys, first Research Question for the present one is formed:

RQ1. Do the presences affect student's satisfaction?

RQ2. What is the relationship among the three CoI framework presences?

Stenbom (2018) has found in his review that finally teaching presence was proved to have a positive effect on social presence and both teaching and social presences have a positive influence on cognitive presence. Specifically, as mention in the literature review, Garrison et al (2010) have found that teaching presence directly affected cognitive presence. and associated with social presence. The mediating effect of social presence on cognitive presence was also confirmed. From the above, three hypotheses are formulated:

H1a: Teaching presence has a positive influence on students' satisfaction.

H1b: Social presence has a positive influence on students' satisfaction.

H1c: Cognitive presence has a positive influence on students' satisfaction.

H1d: Teaching, social and cognitive presences have a positive influence on students' satisfaction.

H2: Teaching presence positively influences cognitive presence.

H3: Teaching presence positively influences social presence.

H4: Social presence would take on a mediating role for teaching presence to positively predict cognitive presence in an online learning environment.

Also, over the last 20 years the effect of demographic factors, communication tools and students' qualifications on student's satisfaction have been investigated, along with the three presences relationships. Gender, age, employment status, perceived ease of use for communication tools and academic disciplines have been subject of research. Marks et al. (2005) mentioned that the effect of age and gender on student satisfaction is an open issue. Further research questions, regarding learners' characteristics are being formulated:



RQ3: How do students' satisfaction and presences perceptions change by gender?

RQ4: How does learners' age affect the impact between coi presences and student perceived satisfaction?

Findings on Stenbom' review (2018) suggest that in bibliography learner's gender has a significant correlation with presences. Garrison et al. (2010) suggest a further exploration of this relationship, as they found no significant correlation. So, the fourth hypothesis for the present survey is posed:

H5a: The impact of cognitive presence on satisfaction with distance learning experience is stronger with female rather than male participants.

H5b: The impact of social presence on satisfaction with distance learning experience is stronger with female rather than male participants.

H5c: The impact of teaching presence on satisfaction with distance learning experience is stronger with female rather than male participants.

Moreover, Lee and Faulkner (2010) mention that participants' age is a controversial issue. On the one hand there are researchers who have found no significant relationship between age and online education experience, on the other hand some studies have shown that the older learners participate easier in online communication. So, the fifth hypothesis is proposed:

H6a: The impact of cognitive presence on satisfaction with distance learning experience is stronger with younger rather than older participants.

H6b: The impact of social presence on satisfaction with distance learning experience is stronger with older rather than younger participants.

H6c: The impact of teaching presence on satisfaction with distance learning experience is stronger with older rather than younger participants.

Also, in order to examine the mediation effects of each CoI element on the relationships between the rest of the items and student perceived satisfaction, 3 more hypotheses are proposed:

H7a (H3 & H1b): Social Presence mediates Teaching Presence and student satisfaction relationship.

H7b (H2 & H1c): Cognitive Presence mediates Teaching Presence and student satisfaction relationship.

H7c (H4 & H1c): Cognitive Presence mediates Social Presence and student satisfaction relationship.

Research framework is explained in Figure 2, based on the hypotheses above.



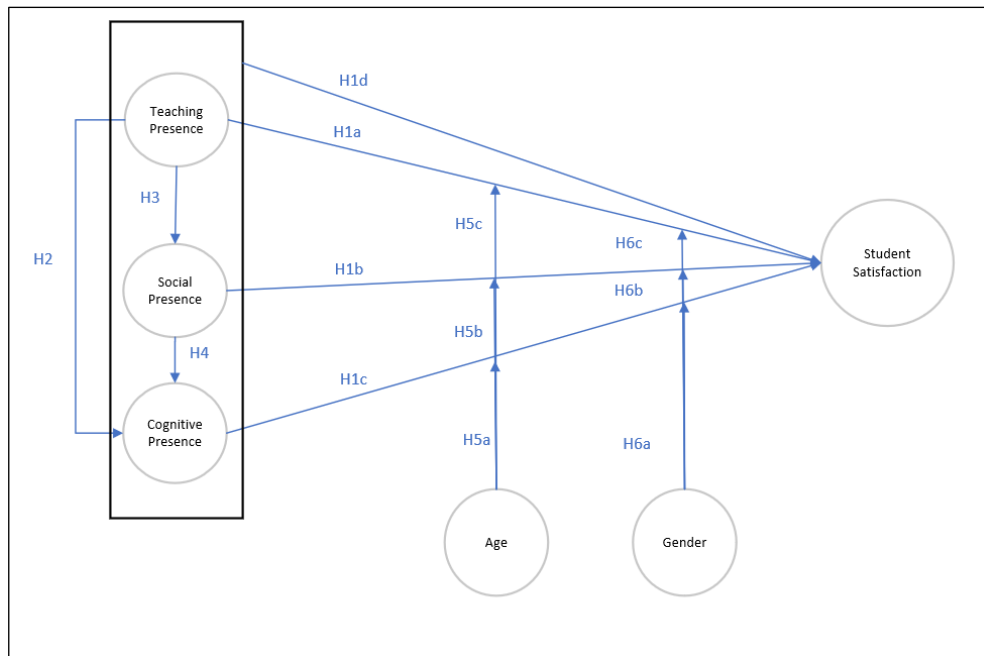


Figure 2: Research framework

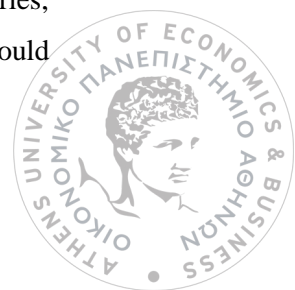
3. METHODOLOGY

3.1 Research Context

The research will be conducted at Athens University of Economics and Business among Master of Science Management Science and Technology, Master of Business Analytics and Master of Human Resources Management students of academic years 2019-2020. All the three programs are offered by the School of Management Science and Technology and they lead to a Master diploma. Students are graduates from Greek or foreign universities, divided in full or part time classes, based on whether they are employed or not.

Regarding the Department of Management Science and Technology, commonly the part-time cohorts consist of 30 to 34 students and the full-time cohorts to consist of 25-30 students. Based on Master's operation regulations, maximum student number for full-time cohorts is 50 students and for part-time cohorts are 40 students. According to the Department's data, the default studying duration is three semesters, with only a little percent of full-time students extending their studies to 4 semesters. On the contrary, the default part-time studying duration is 5 semesters, where the fifth is used only for student dissertation composition. The majority of the part-time students finished their studies after the fourth semester. For the four cohorts of Part and Full time, 2019 and 2020, total student sample was 117.

Also, MST department offers around 35 courses, belonging to three categories, Management Science, Operational Skills and Information Technology. Each student should



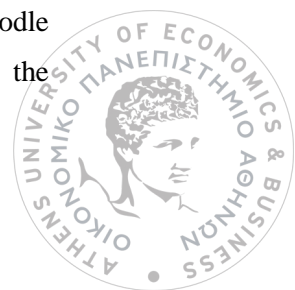
have, by the end of his studies, participated successfully in 15 elective courses and 4 mandatory courses, so each one of the participants responses in the survey for their total experience based on 19 courses in total. The Department employs about 35-55 professors and instructors. The two last students' satisfaction evaluations indicated very high ranges of satisfaction regarding total taught courses and total instructors. The evaluations are conducted as anonymous surveys, using 5-point Likert scale and for both 2019-2020 and 2020-2021 periods, responses means were about 4 for courses and about 4,2 for teachers, while student response percentage was between 43 to 50 %.

The three Master programs share the same professor and instructors, as part of the same School. Business analytics program offers course in four categories, Business Environment and Processes, Statistics, Data Management and Optimization and Knowledge Discovery. Master of Human Resources offers courses in three categories, Main Topics for HRM environments, Basic HRM functions and Strategic and developmental tasks of HRM. For Business Analytics and Human Resources departments, satisfaction level before Covid-19 was high and similar to that of MST program.

3.1.1 Programs operation during the pandemic

During the pandemic, all the courses were taught online, in both synchronous and asynchronous ways. Microsoft Team platform was used in order for synchronous, online classes where instructors and students were able to see one another, form and answer questions and at the same time, discuss and explore different ideas and solutions. The extended use of cameras from teachers was creating a real class sense, as students were able to watch their instructors during their presentations and not only to hear them reading their notes. Students could also use their cameras when they need to talk, but most of them choose to open their cameras only when they need to make a presentation themselves or to share a screen. Another helpful medium was share scene for teachers, especially when it was about programming courses. Despite the fact that they used to share their screen with students also during the previous alive classes, the class had the ability to watch software and coding environments on their screens and perform the same steps if they wanted, without facing connection problems or incompatibilities, because the instructors or the assistants were able to solve the problems directly. Finally, Microsoft Teams provided the instructors with easy to use pole tools and so, they were able to keep the students attracted and make their lessons more appealing, by motivating their students to participate in little poles based on the discussion topics.

Regarding the asynchronous medium, there were several asynchronous methods used, in order for teachers and students to share learning material, such as notes, presentations, instructions, and other helpful content. The University had already been using the Moodle platform, so this continued to be the major medium of material sharing. Moreover, the



Microsoft Teams provided new opportunities for students to send files to instructors, pose questions, receive alerts for deadlines and updates and communicate directly with their teachers and their classmates. Furthermore, Facebook Messenger was a popular medium between the cooperated classmates. Students from the same cohorts had created groups where announcements and important information regarding the classes were posted. Also, most of the learners used to use chat groups in order to communicate, cooperate for their homeworks, exchange common files and documents, or even make calls for their online meeting.

Regarding the digital learning period at Msc MST program, the CoI elements have the following applications:

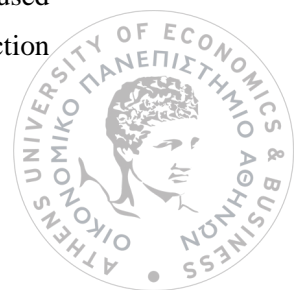
i) Cognitive presence was achieved through synchronous on-line sessions using Microsoft Teams platform. Teachers share their presentations through the platform and, as in a face-to-face class, they can present them on board. The participants discuss the subject in real time, students can ask questions directly through their microphones or through a live writing chat channel and instructors can answer directly, in order to help the community, and, so, to provide knowledge.

ii) Social presence was enhanced by the direct communication between the participants. Using cameras and talking about their concerns, students and instructors have the ability to have optical cues, understand linguistic signs, present their characters during conversations and, finally, interact with others like in a real conversation.

iii) Teaching presence was including course facilitation and student motivation to participate in course's activities, in order for the courses purpose to be completed. Instructors informed students through emails and online direct messages. Also, during the online courses, instructors were helping students to understand courses important topics through productive discussion and timely feedback on student questions.

3.2 Instrument and Measures

The instruments used in the online survey consisted of three parts: (i) 20 demographics questions (gender, age, cohort, working condition, diploma level, courses platform ease of use), (ii) Community of Inquiry (34 items), and (iii) Satisfaction (12 items). Teaching, Social and Cognitive presence are considered to be the independent variables of the present study. The three presences of Community of Inquiry were tested through the CoI framework survey instrument developed by Arbaugh et al. (2008). The instrument consists of 9 social presence items, 12 cognitive presence items, and 13 teaching presence items. No further analysis of presences categories was performed. Also, student perceived satisfaction in the presents study represents the dependent variable. For student satisfaction measurements, items were used from Arbaugh (Arbaugh, 2018). From the 12 initial items of Arbaugh' perceived satisfaction



instrument (2018), two items were excluded, because they refer to student willing of taking online lessons and they did not meet surveys' scope to explore forced transition to distance learning environments. Initial instruments and study's final instrument can be found in Appendix B.

All survey items were rephrased in order to meet the needs of the survey according to the research context. A 5-point Likert scale (1=Strongly Disagree to 5= Strongly Agree) was utilized and the instrument was translated in Greek, which is participants' native language. The final survey instrument was evaluated by experts in order to prove if translations expressed exactly the same question with the initial English phrase. Final survey instrument could be found in Appendix B.

3.3 Sample and Data Collection

The survey was taking place in Athens University of Economics and Business, among the students of Master Programs of Management Science and Technology (MST), Business Analytics (BA) and Human Resources Management (HRM). The total sample was 100 students, 80 from MST, 14 from BA and 6 from HRM, who answered a 68-items questionnaire. The questionnaire was created on Microsoft Forms platform and it was distributed through email and Facebook groups. After 20 days, there was a reminder through email for learners to response.

4. DATA ANALYSIS

4.1 Participant data

From the total sample, female are 51 of the participants and male are 49 of them. Also, 53 of the participants are between 26 and 29 years old, 22 are between 22 and 25 years old and 16 are from 30 to 35 years old. The rest 9 of them are over 35 years old. As for the academic diplomas of the participants, about 86 of the participants hold a graduate diploma and only 14 of them hold a previous Master diploma. Also, most of the participants belong to Part time cohorts of 2019 and 2020 with 29 in each cohort respectively, 18 in Full time 2019 and 24 in Full time 2020. For 48% of the students learning achievement on the time of the survey was above 8.5 on a scale from 0 to 10. Finally, as for the used medium, 99 out of 100 participants used their computer, 42 of them used only their computer, while the rest 57 used other devices, too. Only 1 respondent used only a tablet for MS Teams. Students were in general satisfied with the MS TEAMS, which they used as a platform for their online courses. Regarding the MS TEAMS ease of use, the mean was 3.8, which means that students



are tend to be satisfied with the courses medium ease of use. Also, in general, students had a high intention to transfer knowlegde to their work environment after their studies. The above demographics and statistical data are represented by diagrams, in APPENDIX A, figures 3 to 11.

4.2 Descriptive Statistics

Collected responses were statistically analyzed, using the IBM SPSS 25 software. Data are ordinal, as responses of 5-point Likert scale. Below a table with variables abbreviations can be found.

Study Variable	Abbreviation
Social Presence	SP
Teaching Presence	TP
Cognitive Presence	CP
Students Satisfaction	SST

Table 1: Variables abbreviations

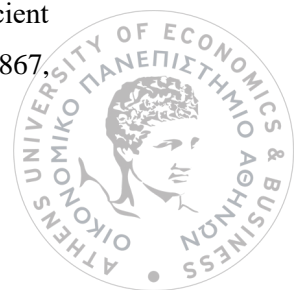
Firstly, data were inspected for missing values and outliers. As all questions were mandatory to be answered and there were no missing values, no responses were excluded. In order to exclude univariate outliers, the standardized z scores were calculated. Accepted z-scores are between -3 and +3 for every item, so there is no consideration for deleting responses. Also, normal distribution was investigated. According to Pardisa and Kadir (2017), previous studies suggest that skewness is acceptable for normal distribution for values between -3 and +3 and kurtosis between -10 and +10. For the present research, skewness per item does not exceed absolute value of 2 and kurtosis per item does not exceed an absolute value of 5. As a result, data supposed to be normally distributed.

Furthermore, the internal consistency of the instrument was examined. Cronbach's alpha coefficient validates questionnaire reliability and validity. As it is shown in the following table, the Cronbach's alpha is calculated for each one of the multi-item scales. Items SST7, SST8, SST9 were reversed, in order not to effect negative the alpha coefficient. Calculated values ranged from 0.801 to 0.929 and exceed the cut-off limit of 0.7, as it is suggested by several researchers in Peterson's metanalysis (Peterson, R.A.,1994).

	Items	Cronbach's alpha
Social Presence	9	0.867
Teaching Presence	13	0.894
Cognitive Presence	12	0.888
Students Satisfaction	10	0.929

Table 2: Cronbach' Alpha per scale

For the internal consistency of the instrument, the Cronbach' alpha if an item was excluded is also under consideration. For Teaching presence items, no item's coefficient exceeds the constraint's alpha 0.894. For Social presence, scale's Cronbach' alpha is 0.867,



when for most of the items it is lower, except for the SP3 (0.874). That means that the item could be excluded. Similar to the previous, Cognitive presence coefficient is 0.888 and there is no item to exceed this value, so the scale is consistent enough. Student satisfaction scale coefficient is 0.929 and no item's coefficient exceeds the scale's coefficient. Although, because of the initial high Cronbach' Alpha coefficient, no items were deleting from the model. Coefficients for each scale are showed in Appendix C, Table 22.

Following the consistency analysis of research variables, responses per scale item are shown in the following tables, in % percentages.

SOCIAL PRESENCE	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
SP1	5	24	34	32	5
SP2	2	21	30	37	10
SP3	10	38	30	19	3
SP4	2	19	20	49	10
SP5	5	20	24	43	8
SP6	6	23	28	40	3
SP7	4	27	32	31	6
SP8	3	10	46	37	4
SP9	7	27	36	23	7

Table 3: Social presence responses in %

TEACHING PRESENCE	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
TP1	2	9	34	48	7
TP2	0	13	27	54	6
TP3	0	13	28	47	12
TP4	4	10	24	53	9
TP5	0	13	41	42	4
TP6	1	17	41	38	3
TP7	1	23	29	41	6
TP8	3	28	39	26	4
TP9	2	18	36	36	8
TP10	2	19	39	37	3
TP11	1	15	33	47	4
TP12	7	26	29	31	7
TP13	8	23	30	36	3

Table 4: Teaching presence responses in %



COGNITIVE PRESENCE	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
CP1	5	20	34	38	3
CP2	1	22	25	47	5
CP3	4	26	24	39	7
CP4	3	12	14	58	13
CP5	0	10	26	54	10
CP6	1	21	22	49	7
CP7	0	7	26	58	9
CP8	2	14	23	56	5
CP9	0	11	36	44	9
CP10	1	12	25	55	7
CP11	2	12	24	59	3
CP12	0	6	15	64	15

Table 5: Cognitive presence responses in %

STUDENTS SATISFACTION	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
SST1	4	23	30	38	5
SST2	4	16	34	41	5
SST3	11	35	31	20	3
SST4	6	28	27	26	13
SST5	8	37	36	16	3
SST6	19	36	14	21	10
SST7	12	29	33	21	5
SST8	13	21	19	31	16
SST9	13	30	27	24	6
SST10	7	17	27	34	15

Table 6: Student Satisfaction responses in %

Descriptive statistics for the items of each constrain is shown in the following tables. Students responded positively for most of the questions, with mean values to be greater than 3, which means that students made a neutral statement or declared their agreement with most of the questions. Teaching presence (Table 7) got a positive response, with means values between 3 and 3.58 and total mean of 3.3. Skewness values are negative, but for most of the items its values are between 0 and -1, which indicates that most of the students agreed or is neutral regarding the items' statements. Additionally, considering social presence, students tended to disagree, with mean values from 2.67 to 3.46 (Table 8). The total scale mean was 3.14. Skewness values for the most of the responses are negative with values between 0 and -1, which means that students are mostly neutral regarding items statements. The last examined constrain is the cognitive presence. Students responded positively regarding their perspective



on cognitive presence. Mean values were calculated from 3.14 to 3.88 and small values of negative skewness confirmed the tense of student agreement (Table 9). Total scale mean was 3.49, the greater between the tree presences. Finally, last examined scale was student perceived satisfaction. Items mean values were between 2.67 and 3.33, while total scale mean score was 3.02. Along with skewness for most of the items is positive, which indicates mostly neutral responses regarding satisfaction for the most of the students (Table 10). For each one of the constrains, descriptive statistics are showed in Table 11. Similar to previous analysis of the questionnaire items, the data distribution could be considered as normal, because the absolute skewness for every constrain is less than 3 and the absolute kurtosis is less than 10.

		Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TEACHING PRESENCE	TP1	1	5	3.49	.835	-.606	.241	.506	.478
	TP2	2	5	3.53	.797	-.527	.241	-.328	.478
	TP3	2	5	3.58	.867	-.299	.241	-.536	.478
	TP4	1	5	3.53	.937	-.878	.241	.600	.478
	TP5	2	5	3.37	.761	-.180	.241	-.486	.478
	TP6	1	5	3.25	.809	-.256	.241	-.397	.478
	TP7	1	5	3.28	.922	-.196	.241	-.829	.478
	TP8	1	5	3.00	.910	.082	.241	-.496	.478
	TP9	1	5	3.30	.927	-.171	.241	-.427	.478
	TP10	1	5	3.20	.853	-.299	.241	-.395	.478
	TP11	1	5	3.38	.826	-.485	.241	-.289	.478
	TP12	1	5	3.05	1.067	-.101	.241	-.762	.478
	TP13	1	5	3.03	1.020	-.353	.241	-.721	.478

Table 7: Teaching Presence descriptive statistics



		Mini mum	Maxi mum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SOCIAL PRESENCE	SP1	1	5	3.08	.981	-.163	.241	-.582	.478
	SP2	1	5	3.32	.984	-.165	.241	-.689	.478
	SP3	1	5	2.67	.995	.269	.241	-.540	.478
	SP4	1	5	3.46	.979	-.512	.241	-.510	.478
	SP5	1	5	3.29	1.038	-.444	.241	-.571	.478
	SP6	1	5	3.11	.994	-.414	.241	-.704	.478
	SP7	1	5	3.08	.992	-.036	.241	-.703	.478
	SP8	1	5	3.29	.820	-.474	.241	.563	.478
	SP9	1	5	2.96	1.034	.081	.241	-.517	.478

Table 8: Social Presence descriptive statistics

		Minim um	Maxim um	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
COGNITIVE PRESENCE	CP1	1	5	3.14	.943	-.433	.241	-.442	.478
	CP2	1	5	3.33	.911	-.380	.241	-.800	.478
	CP3	1	5	3.19	1.032	-.223	.241	-.857	.478
	CP4	1	5	3.66	.956	-.966	.241	.593	.478
	CP5	2	5	3.64	.798	-.472	.241	-.133	.478
	CP6	1	5	3.40	.932	-.428	.241	-.723	.478
	CP7	2	5	3.69	.734	-.530	.241	.229	.478
	CP8	1	5	3.48	.870	-.829	.241	.180	.478
	CP9	2	5	3.51	.810	-.149	.241	-.440	.478
	CP10	1	5	3.55	.833	-.696	.241	.179	.478
	CP11	1	5	3.49	.823	-1.023	.241	.587	.478
	CP12	2	5	3.88	.729	-.770	.241	1.002	.478

Table 9: Cognitive Presence descriptive statistics



		Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
STUDENTS SATISFACTION	SST1	1	5	3.17	.975	-.283	.241	-.647	.478
	SST2	1	5	3.27	.930	-.491	.241	-.166	.478
	SST3	1	5	2.69	1.012	.182	.241	-.614	.478
	SST4	1	5	3.12	1.140	.053	.241	-.909	.478
	SST5	1	5	2.69	.940	.289	.241	-.249	.478
	SST6	1	5	2.67	1.280	.379	.241	-1.029	.478
	SST7	1	5	2.78	1.069	.099	.241	-.635	.478
	SST8	1	5	3.16	1.293	-.219	.241	-1.095	.478
	SST9	1	5	2.80	1.128	.103	.241	-.846	.478
	SST10	1	5	3.33	1.138	-.346	.241	-.636	.478

Table 10: Student Satisfaction descriptive statistics

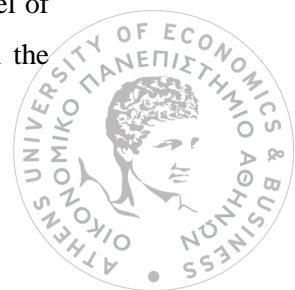
	Range	Mini mum	Maxi mum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SST	3.80	1.00	4.80	3.0200	.85647	-.040	.241	-.594	.478
TP	3.15	1.77	4.92	3.3069	.59035	-.109	.241	.494	.478
SP	3.56	1.00	4.56	3.1400	.68304	-.599	.241	.741	.478
CP	3.17	1.83	5.00	3.4967	.58218	-.536	.241	.522	.478

Table 11: Scale descriptive statistics

All variables relevant bar charts are presented in Appendix A, figures 12-15.

4.3 Variable Correlations and Multivariate Regression Analysis

As it is mentioned previously, the present study aims to predict students' satisfaction, based on students' opinion about teaching, social and cognitive perception. After descriptive statistics for the total sample of 100 students, relationships among independent and dependent variables are examined. Pearson's correlation analysis is used to measure relationships between dependent and independent variables. As it is described in the table below, all independent variables TP, SP and CP are positive correlated with students' satisfaction, with Pearson Correlation coefficient 0.521, 0.553 and 0.446 respectively, at a significance level of 0.01. So, hypotheses H1a, H1b and H1c are accepted. As for the relationships between the



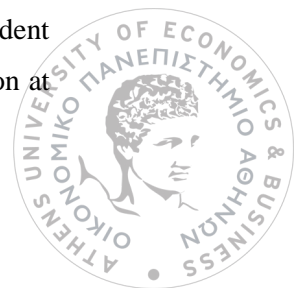
independent variables, they are positively correlated one each other with significance level Of 0.01. Stronger correlation is observed between teaching and cognitive presence with coefficient of 0.740, following by social and cognitive presences with coefficient of 0.558 and weaker correlation between teaching and social presence with correlation coefficient of 0.525. Both hypotheses H2 and H3 are accepted. Finally, for the total effect of the three presences on student satisfaction, CoI variable was calculated as the mean of each student responses. Pearson correlation between SST and CoI was 0.586 with significance level of 0.01, two-tailed, indicating that H1d is also satisfied and accepted.

		Correlations				
		SST	TP	SP	CP	Col
SST	Pearson Correlation					
	Sig. (2-tailed)					
	N					
TP	Pearson Correlation	.521**				
	Sig. (2-tailed)	.000				
	N	100				
SP	Pearson Correlation	.553**	.525**			
	Sig. (2-tailed)	.000	.000			
	N	100	100			
CP	Pearson Correlation	.446**	.740**	.558**		
	Sig. (2-tailed)	.000	.000	.000		
	N	100	100	100		
Col	Pearson Correlation	.586**	.895**	.784**	.896**	
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	100	100	100	100	

Table 12: Pearson Correlations for dependent and independent variables

After correlation analysis, a backward multiple regression analysis was performed, in order to identify the dependent variables prediction model. In the backward regression, the model starts with all independent variables and gradually predictors that are not significant for the model, are removed. The analysis required two rounds of regression. In the initial round all three independent variables, TP, SP, CP, were checked for their significance in the prediction model. In the second round CP was removed from the model. The relevant results for students' satisfaction are presented in the following tables. R square value indicates that for the 37.9 % of the cases, student satisfaction could be predicted by the values of students' perspective of social and teaching presence. Durbin-Watson statistics value of 2.17 shows no autocorrelation of residuals, as it is within the range 1 to 3 (Table 13).

Variance inflation factor proves that there is not multicollinearity between independent variables, as for both the rounds of regression, VIF is below the threshold of 2.5 (Johnston at



al., 2018). Specifically, for the second regression round, VIF is 1.38 for both TP and SP variables. Also, homoscedasticity of data was checked with scatter plots. Placing standardized residuals in Y-axis and standardized predicted values in X-axis, we observed that all points are between $[-3, +3]$ for both axes. So, the homoscedasticity assumption is satisfied. Furthermore, P – P plot proves that normality is satisfied, as all points follow the diagonal line. Both scatter plot and P -P plot can be found in Appendix A, figures 15 and 16. Finally, in order to prove that there are no outliers, Mahalanobis' and Cook's distances were calculated. Cook's distance is used to find influential outliers in our predictor variables. Values were between 0 and 0.15435, which is accepted as Cook's distance range is 0 to 1. Mahalanobis' distance shows the distance from a point to the distribution. Mahalanobi's distance values were between 0.01977 and 10.26361, with no significance less than 0.001. So, it is assumed that there were no multivariate outliers.

The results from multiple linear regression are presented below. F value for 3 independent variables was 19.564, while after the second round with 2 variables, it changed to 29.644, which means that the second model can predict more accurate the dependent variable Student satisfaction (Table 14). For both rounds, significance is lower than 0.00, which means that the null hypothesis is rejected and it is confirmed that independent variables Teaching Presence, Social presence and cognitive presence can significantly predict the dependent variable "student satisfaction". Finally, standardized B coefficients show which independent variable is the most important for the estimation model. Between TP and SP variables it is observed that SP is the most important with B coefficient of 0.386, following by TP with coefficient of 0.318. Also, for both variables significance level is below 0.05, which means that they both are statistically significant. On the contrary, on the first round, CP variable had high significance coefficient 0.927 and beta coefficient equal to -0.011, which is lower than the other two variables and, so, it was removed from the final prediction model. Tables 13, 14, and 15 present the linear regression results. Dependent variable is student satisfaction (SST), while Model 1 includes the three presences (TP,SP,CP) and Model 2 includes only TP and SP.

Next step for student satisfaction prediction was to conduct a Confirmatory factor analysis. Amos 18 software was used to investigate factor loadings of items of the three scales. The preliminary results indicated that 10 items had factoring loads below the threshold of 0.5. These items were TP3, TP12, TP13, SP1, SP2, SP3, CP1, CP4, CP11 and CP12. After the CFA analysis, a second multiple regression was performed, in order to examine if deleting these 10 items could lead in a better prediction model for student satisfaction. Second regression results indicated that after 10 items were deleted, the model prediction was not improved. New scales could predict only 37.4% of student satisfaction. So, it was decided no items to be excluded for the present research.



Model Summary										Durbin-Watson
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change	
						F Change	df1	df2		
1	.616	0.379	0.360	0.68517	0.379	19.564	3	96	0.000	
2	.616	0.379	0.367	0.68165	0.000	0.008	1	96	0.927	2.170

Table 13:Students' satisfaction model summary, multiple regression

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.553	3	9.184	19.564	.000
	Residual	45.067	96	0.469		
	Total	72.620	99			
2	Regression	27.549	2	13.774	29.644	.000
	Residual	45.071	97	0.465		
	Total	72.620	99			

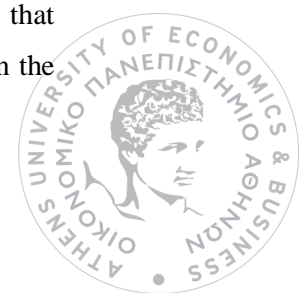
Table 14:Students' satisfaction ANOVA results

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1	(Con.)	-0.013	0.443		-0.029	0.977					
	TP	0.472	0.177	0.326	2.667	0.009	0.521	0.263	0.214	0.434	2.303
	SP	0.487	0.124	0.389	3.930	0.000	0.553	0.372	0.316	0.661	1.512
	CP	-0.017	0.184	-0.011	-0.091	0.927	0.446	-0.009	-0.007	0.413	2.422
2	(Con.)	-0.027	0.412		-0.066	0.947					
	TP	0.462	0.136	0.318	3.389	0.001	0.521	0.325	0.271	0.725	1.380
	SP	0.484	0.118	0.386	4.107	0.000	0.553	0.385	0.329	0.725	1.380

Table 15: Coefficients for Students satisfaction model

4.4 Mediation Effects

In order for the Hypothesis H7a, H7b and H7c to be tested, Sobel test was performed. Sobel z-test is based on Sobel (1982) work. For the present research, the calculator of Vanderbilt University and Preacher K.J. was used. (Calculation for the Sobel Test,2022). Finally, results were interpreted based on MacKinnon and Luecken paper (2012). In the following table, z- and p- values are showed. Based on these calculations, we conclude that Social presence has a mediation effect on Teaching presence and student satisfaction. On the



other hand, Cognitive presence does not mediate relationship between Teaching presence and student satisfaction, neither the relationship between Social presence and student satisfaction. So, H7a was satisfied, but H7b and H7c were rejected. Also, H4 hypothesis, that social presence mediates the relationship between Teaching and Cognitive presence, was satisfied.

	Z-value	P-value
Social Presence on Teaching Presence - Satisfaction	3.40918	0.0006516
Cognitive Presence on Teaching Presence - Satisfaction	1.037591	0.299461
Cognitive Presence on Social Presence - Satisfaction	1.915814	0.055389
Social Presence on Teaching Presence - Cognitive Presence	2.739059	0.006162

Table 16: Sobel z-test results

4.5 Comparisons Between Groups

For the present study, student gender and student age were used as filters between CoI framework presences and student satisfaction. Gender was coded as 1 for men and 2 for women, while age for comparison purposes was coded as 1 for 22-25 years, 2 for 26-29 and 3 for 30+ years old students. The relevant results are showed in tables below. For gender filter, it is clearly observed that correlations are greater for each one of the presences and student satisfaction for women. From the above, hypotheses H5a, H5b and H5c is accepted. Furthermore, age is also a significant filter. Results presented below indicated that for younger students (below 25 years old) Teaching and Social Presence has greater impact on student satisfaction than older students, above 26 years old. Also, cognitive presence tends to be insignificant for students older than 30 years old. Conclusively, H6a hypothesis is accepted, while H6b and H6c hypotheses are rejected.

Correlations							
GENDER	SST			TP	SP	CP	coi
Man	SST	Pearson Correlation		.421**	.496**	.361*	.497**
		Sig. (2-tailed)		0.003	0.000	0.011	0.000
		N	49	49	49	49	49
Woman	SST	Pearson Correlation		.610**	.599**	.519**	.662**
		Sig. (2-tailed)		0.000	0.000	0.000	0.000
		N	51	51	51	51	51

Table 17: Gender effects on presences impact on student satisfaction



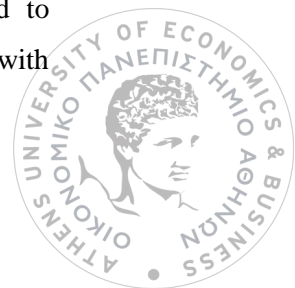
Correlations							
AGE			SST	TP	SP	CP	coi
22-25	SST	Pearson Correlation	1	.678**	.731**	.429*	.723**
		Sig. (2-tailed)		0.001	0.000	0.046	0.000
		N	22	22	22	22	22
26-29	SST	Pearson Correlation	1	.458**	.456**	.453**	.528**
		Sig. (2-tailed)		0.001	0.001	0.001	0.000
		N	53	53	53	53	53
30+	SST	Pearson Correlation	1	.486*	.513**	0.392	.520**
		Sig. (2-tailed)		0.014	0.009	0.052	0.008
		N	25	25	25	25	25

Table 18: Age effects on presences impact on student satisfaction

5. FINDINGS, HYPOTHESIS TESTING AND DISCUSSION

5.1 Findings and Hypothesis Testing

After the above statistical analysis, survey's results are presented in this chapter, along with discussion about study's implications. First of all, the examination of CoI presences indicated that student perception on the three presences and their perceived satisfaction has been decreased by 1 point in 5-point Likert scale, compared to prior academic years' student satisfaction surveys. It could be told that programs as total, were operating efficiently, in general, but there are several opportunities for future improvement. It is noticeable that fully online operation of the three examined Master programs was forced by Covid-19 limitations, so it could be considered that the decrease was expected, as neither faculty nor students were prepared for this unexpected change. Specific responses per item are indicative for student perception on the efficiency of the online education. As it concerns their perceived satisfaction, most of the students agreed that program's quality was affected by the distance (SST6), while they agree that they could attend the same program online, the online program addressed their needs well, they were not disappointed by the distance education and the delivery of courses through the internet did not make them more difficult than other courses (SST7, SSI2, SST8, SST9). Also, student perspectives on the three presences are controversial. Despite the fact that most of the students agreed that they felt good to converse through the online medium, to participate in online discussions and to interact with

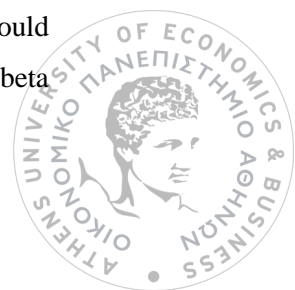


the other participants (SP6, SP7, SP8), also most of the students agreed that the online communication is not an excellent social interaction method (SP3). Furthermore, for the most of Teaching presence scale items, students agreed with their statements about faculty members efficiency and their positive contribution on the success of online operation. Finally, most of the students responded positively that they can apply the knowledge created from the program on their work or other similar activities (CP12) and this could be a hint for further research on students' intention to transfer the created knowledge on their work.

Following the important findings on student perceptions on CoI presences, regression analysis and correlations between presences should be further discussed. First of all, it is worthy for the high Cronbach' alpha coefficients of the instrument to be mentioned. Scale coefficients were greater than 0.86 for each one of the four scales and this fact proves the internal consistency of survey's instrument. Of course, both CoI framework instrument and student perceived satisfaction scale validity and reliability have been also proved by researches in different contexts. Furthermore, finding per research questions are analyzed.

The first research question examined whether the CoI presences affect student perceived satisfaction. Pearson correlations table (Table 12) suggested that CoI presences are significantly correlated with student perceived satisfaction. On the one hand, Teaching presence and students' satisfaction correlation was statistically significant, with correlation $r = .521$ and significance level $p < .01$ (two tailed). The social presence variable was also positively correlated with the dependent variable, students' satisfaction, with correlation $r = .553$ and significance level $p < .01$ (two tailed). These results indicate that participants with high perception of teaching presence also indicated they were highly satisfied with the online program. Similarly, participants with high perception of social presence also indicated a high satisfaction with the online program. On the other hand, cognitive presence variable was also positively correlated with student satisfaction, but with a medium correlation with $r = 0.446$ and significance level $p < .01$ (two tailed). That means that participants with high perception of cognitive presence also indicated they were highly satisfied with the online program, but in lower level than it is indicated by teaching and social presences. CoI framework as a total found to be highly correlated with student satisfaction, with correlation coefficient equal to 0.586 and significance level $p < .01$ (two tailed). From the above, it is concluded that all four hypotheses H1a to H1d, which were formed based on Research question 1, are satisfied and accepted.

Furthermore, to better understand the relationships between CoI framework elements and students' satisfaction, a regression between the three presences and student satisfaction was performed. Three presences as a group predicted 37.9% of the variance in students' satisfaction, with R^2 equals to 0.379. As it was analyzed it Chapter 4, Cognitive presence could not be considered as a significant predictor of students perceived satisfaction. While beta



coefficients of teaching and social presences were 0.326 and 0.389 respectively and both statistically significant, Cognitive presence's beta coefficient revealed to be statistically insignificant for student satisfaction prediction. After Cognitive presence removal from Model 1, R^2 of model 2 did not changed. So, cognitive presence seems to have no contribution to students' satisfaction prediction. Unstandardized beta coefficients from Table 15 could be used to predict students' satisfaction by the following equation:

$$Y = -0.027 + 0.462 * X_1 + 0.484 * X_2$$

where Y is the dependent student satisfaction variable, X1 in the independent variable teaching presence and X2 is the independent variable social presence. So, the survey concluded that social presence was the most significant predictor of student satisfaction, followed by teaching presence.

Also, mediation effects examination revealed that cognitive presence could not be considered as mediator between teaching presence and social presence prediction of student satisfaction, as it is indicated by Sobel z-test results (Table 16). On the contrary, social presence could be considered as mediator between Teaching presence and student satisfaction prediction. Similar results are indicated, also, by partial correlations of regression analysis, where the social presence mediates the relationship between teaching presence and satisfaction with coefficient equal to 0.372, while cognitive correlation is -0.009. Obviously, social presence has a significant role in the relationships between the CoI framework and student perceived satisfaction. So, in Table 19 hypotheses H7a, H7b and H7c confirmation could be found.

H1a	<i>Teaching presence has a positive influence on students' satisfaction.</i>	Accepted
H1b	<i>Social presence has a positive influence on students' satisfaction.</i>	Accepted
H1c	<i>Cognitive presence has a positive influence on students' satisfaction.</i>	Accepted
H1d	<i>Teaching, social and cognitive presences have a positive influence on students' satisfaction.</i>	Accepted
H7a	<i>Social Presence mediates Teaching Presence and student satisfaction relationship.</i>	Accepted
H7b	<i>Cognitive Presence mediates Teaching Presence and student satisfaction relationship.</i>	Rejected
H7c	<i>Cognitive Presence mediates Social Presence and student satisfaction relationship.</i>	Rejected

Table 19: H1 and H7 Hypotheses confirmation

The second research question examined the dynamic relationships among the three CoI presences. Pearson's correlations among the CoI presences indicated that presences are highly correlated between each other, with correlation coefficients above 0.5. Specifically, Teaching and Social presences are correlated with coefficient 0f 0.525, Social and Cognitive presences with coefficient of 0.558 and Teaching and Cognitive presences with coefficient of 0.740. The higher correlation between Teaching and Cognitive presences is not too high to indicate a problematic correlation. Regarding the formed hypotheses, their confirmation can be found in

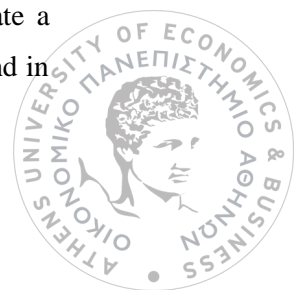


Table 20. Hypothesis 4 acceptance indicated that teaching and cognitive presence correlation is higher, when social and teaching presences correlation is higher.

H2	<i>Teaching presence positively influences cognitive presence.</i>	Accepted
H3	<i>Teaching presence positively influences social presence.</i>	Accepted
H4	<i>Social presence would take on a mediating role for teaching presence to positively predict cognitive presence in an online learning environment.</i>	Accepted

Table 20: Dynamic relationships between CoI elements - Hypotheses confirmation

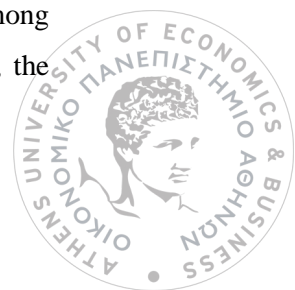
Finally, Research questions three and four are related with comparisons between student gender groups and age groups if and in what level the impact of each one of the presences on students perceived satisfaction in changing between genders and between different age group. Results are important for future researchers and online program designers, as they indicated that men and women have different perspectives on CoI elements and the gender affects the impact of CoI presences on student satisfaction. Similar to gender groups, age groups indicated differences on the impact of the three presences on student satisfaction, with the most important finding to be that teaching and social presences impact is greater for younger students, while cognitive presence impact is greater for the older. Table 21 shows comparison results between groups and H5 and H6 hypotheses confirmation.

H5a	<i>The impact of cognitive presence on satisfaction with distance learning experience is stronger with female rather than male participants.</i>	Accepted
H5b	<i>The impact of social presence on satisfaction with distance learning experience is stronger with female rather than male participants.</i>	Accepted
H5c	<i>The impact of teaching presence on satisfaction with distance learning experience is stronger with female rather than male participants.</i>	Accepted
H6a	<i>The impact of cognitive presence on satisfaction with distance learning experience is stronger with younger rather than older participants.</i>	Accepted
H6b	<i>The impact of social presence on satisfaction with distance learning experience is stronger with older rather than younger participants.</i>	Rejected
H6c	<i>The impact of teaching presence on satisfaction with distance learning experience is stronger with older rather than younger participants.</i>	Rejected

Table 21: Comparison between gender and age groups- Hypotheses confirmation

5.2 Discussion

This paper purpose is to investigate the role of Teaching, Social and Cognitive presences in describing, explaining, and improving online learning processes in the context of fully online educational programs and what is the impact of the three presences on student perceived satisfaction. It was further concluded from the literature that online learning processes have been extensively analyzed using Community of Inquiry framework, which has been developed to explain the three presences relationships during distance learning. The importance of the present survey is implemented by the fact that it is conducted among students of different online delivered programs, instead of unique online courses. Also, the



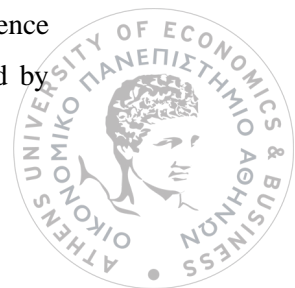
online operation of the examined programs was forced by the emergency and limitation during the pandemic of Covid-19, on 2020. Several statistical methods used in order to address research questions, like Pearson correlations, multiple regression and Sober z-test, while gender and age groups perceptions were compared for their differences of presences impact on student satisfaction.

Survey findings indicate that Teaching and Social presences could predict 37.9% of the variance in students' satisfaction, while Cognitive presence was an insignificant predictor of the dependent variable and Social presence was the most significant predictor of student satisfaction. While similar prediction ratings are reported by previous studies, findings on the significance of the three presences are differentiated among these researches results. Arbaugh (Arbaugh, 2008) reported that CoI elements could predict 22% of the variance in delivery medium satisfaction and similarly to the present study, he found that cognitive presence was not a significant predictor of delivery medium satisfaction. Additionally, Giannoussi and Kioumourtzoglou (2016) found a prediction rate of 39.2% of the variance in students' satisfaction. Contrary to the present study, they found that Cognitive presence was a better predictor of students' satisfaction, compared to Teaching and Social presences. For Alaulamie (2014) that CoI presences explain 38% of the variance in student satisfaction, with Cognitive presence to be the better predictor of student satisfaction. Also, Joo et al. (2011) mentioned that Social presence was not a significant predictor of students' satisfaction, while Cognitive presence was the most significant predictor of student satisfaction.

An important goal of the present research was the dynamic relationship between CoI presences in the context of a fully online program, instead of individual online courses. Conclusions of the present research are aligned with Alaulamie' (2014) and Kumar and Ritzhaupt' surveys (2014) which implemented that CoI framework could be a useful tool for the evaluation of online programs, despite the initial scope of CoI framework on individual online courses.

Social presence proved to be the major predictor of student satisfaction. Pearson correlations indicated that Social is significantly correlated with Teaching and Cognitive presences, as it was expected, based on the previous studies (Garrison et, al,2011), (Shea and Bidjerano, 2009). Also, similar to Joo et al. (2011) and Garrison et al. (2010), mediation effects testing showed that Social presence mediated the relationship between Teaching and Cognitive presence. This could be explained by the fact that during the online courses, students need to enhance their feeling of belonging to a class. So, it is indicated that in the future, designing of online programs should promote student's interaction and communication, in order to enhance Cognitive presence.

Findings on Cognitive presence need to be further explored. While Cognitive presence proved to have significant correlations with Teaching and Social presence, as described by



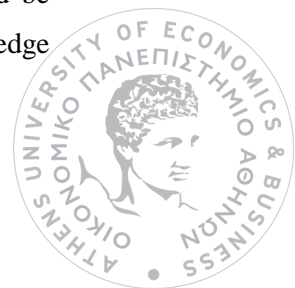
other researchers (Garrison et al., 2010), (Shea and Bidjerano, 2009), (Arbaugh, 2008), it seems that does not mediate any relationship between the other two presences. That means that Teaching and social presences are directly affected between each other, but these presences both have a significant impact of student perception on Cognitive presence. As Cognitive presence considered more related with critical thinking development (Garrison et al., 2000), it is implemented that teachers should take into consideration the need of Cognitive presence in the success and efficiency of different Communities of Inquiry. They need to address student curiosity and triggering them to explore and discover new solutions to posed problems.

Finally, from the above it is obvious that Teaching presence has the major role in course facilitation, structure and organization. Results of the present study regarding Teaching presence's correlations with other two presences, Social and Cognitive, are according to other studies, that mentioned the importance of Teaching presence on the efficient delivery of online courses (Arbaugh & Hwang, 2006), (Garrison et al., 2010). Also, Alaulamie (2014), who studied also the application of CoI framework on fully online programs, found medium positive correlations between the three presences. Teaching presence proved to directly affect both Social and Cognitive presence and, also, to significantly predict student satisfaction. Based on these conclusions and the relevant literature research, it is important to mention that faculty members should start be trained and guided in order to offer a more valuable facilitation and direction of students and courses, according to the CoI framework practices.

5.3 Practical Implications

As it was concluded in the previous paragraph, CoI framework practices could help teachers and instructors to offer more valuable courses. Some useful tips for teachers and instructors, according to the survey's findings from the survey shown that there are some important points for instructors can be found below.

First of all, as students agreed that the online communication is not an excellent social interaction method, it is proposed that during the semesters some face-to-face meetings should be arranged, in order for the students to know each other and their instructors better. In this way, all participants could create stronger relationships and they will be able to interact more effectively during the online lessons. Furthermore, based on student's good feeling about the online conversation through the online medium, it is proposed for instructors to motivate their students to participate in online discussions or to take place in short polls during the courses, in order to interact more between each other through conversations or even small team activities. In this way, learners could have the opportunity to find more common points and interests to share with the other participants and their feeling of class belonging would be enhanced. An also important finding is students' feeling that they can apply the knowledge



created from the program on their work or other similar activities. This is important because educational programs could become more and more popular, as working students will participate in them, in order to gain advanced knowledge and better job opportunities. So, instructors should use examples and discussion topics during their lessons and in their educational material, that is more appealing and familiar for students. In this way, learners could feel closer to courses' mater and they would like to participate more in discussions, in order to explore and create knowledge for topics of their interest. Another interesting method for educational purposes to be fulfilled is the use of a variety of information sources from students and student's brainstorming to find solutions. Using different information sources helps students understanding different perspectives, while brainstorming contributes to finding valuable solutions through information composition.

Finally, Teaching Presence proved to be a major factor of online education program successfulness. Teachers and instructors should facilitate the educational process in favor of students. Courses' goals and topics should be clearly communicated and on time, in order for the students to understand subject matter and to recognize how they will be benefited by every course. It is also important that every topic is clear for students and that they will be able to participate and understand discussions and activities. Topics clarification would help students to focus on relevant issues. Also, during lessons learners should be motivated to participate in lesson's activities, for example exercises or presentations, in order to gain more practical experience. In this way, students will not be boring, their curiosity will be picked and they will extract more meaningful knowledge. Also, for the extraction of knowledge to be facilitated, instructors should provide timely and accurate answers on students' questions. To achieve that, certain communication channels, like e-mail exchange and personal messages should be agreed between students and teachers or even hour meetings should be arranged, during which both learners and students could resolve problems and discuss difficulties that students may have faced. In this way, students could find interesting solutions to their problems and learners could have a better understanding of their student's learning needs and weaknesses. Final suggestion for professors and instructors is the clear instruction for each course activities, in a way that students could be able to find solutions in interesting problems. If instructions are not clarified students could finally be disappointed by their performance and they might drop off classes, because they will feel that these classes are too hard or unsuitable for them.

As for students to be satisfied with online courses and to participate in future programs, they should feel that they belong in a Community of Inquiry. This feeling can be developed and increased, when students feel that they contribute to a common goal and they are valuable members of a team, so the above suggestions hopefully could help instructors to provide qualitative and meaningful courses to their future students.



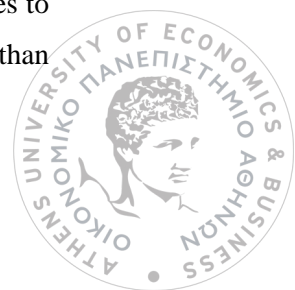
6. LIMITATIONS, FURTHER RESEARCH AND CONCLUSION

6.1 Limitations and Further Research

The present study offers a variety of noticeable results, as it is analyzed in the previous chapter. Although study's important implications and their contribution in the field of online educational program development, there are some interesting limitations to be mentioned. Firstly, because of the study purpose, which was to investigate the CoI framework in the context of online program as a whole and not by individual online courses, there was a limit in study participants. Although small sample was expected, because of the limited participants per program, relevant future studies for larger samples are suggested. Similar limitations have been noticed, regarding participant age. Most of the students are 22-29 years old (over the 50% of the sample) and that could be considered a bias in the analysis of age effects. It is suggested that in the future, similar studies should be addressed in online programs that attract older participants, too. Also, as mentioned in the literature, some studies examine the relationships between CoI presences and other important lesson outcomes, for example student grades. So, for future research a better examination of more interesting impact factors, for example the effects of subject matter type, and more courses outcomes it is also suggested. Last, but not least, the present research attempts to explain the Community of Inquiry in fully online educational programs through Arbaugh' CoI framework instrument (Arbaugh et al.,2008). The fact that the initial instrument was designed for online courses led us to make several transformations and to except items, as indicated by study's needs. So, it is suggested to future researchers to redesign the CoI and satisfaction instruments, in order to better express student thoughts regarding a whole program, as it was examined in the present study, instead of individual courses, as in the most of past researches.

6.2 Conclusion

The findings reported in this study confirm that the established causal relationships among the COI presences could be used not only in online courses, but also for future design of fully online educational programs and evaluation of their outcomes. It also indicated that the COI framework is a useful tool to examine the dynamic relationships among TP, SP, and CP in different participant groups, in order to better address their needs. By comparisons between gender and age groups, it has been noticed that students with different characteristics have different perceptions on lessons outcomes, as teaching, social and cognitive presences to be higher correlated with student satisfaction for women than for men and for younger than



older students. So, during program design instructors should take into consideration participant demographics data, in order better to facilitate courses and fulfil program educational scope. An also important finding of the present research is that cognitive presence was not a significant predictor of student perceived satisfaction. As cognitive presence expresses the way that students communicate and extract knowledge (Garrison et al.,2000), it could be supported that educational purposes were achieved, but student perception on program satisfaction seems to rely on the sense of belonging in a class, which is mainly enhanced by social and teaching presences. So, it is important for future online programs design, instructors to develop common and more efficient communication methods in order to attract students' interesting and make them feel that they still belong to a class. As a generic conclusion of the present survey, it is implied that the CoI framework and approach could be successfully applied in future design of whole online educational programs, as an important and useful tool, in order for students to be satisfied with their online educational experience.



BIBLIOGRAPHY

- Alaulamie**, L. A., 2014, Teaching Presence, Social Presence, and Cognitive Presence as Predictors of Students' Satisfaction in an Online Program at a Saudi University (Doctoral dissertation, Ohio University),
https://etd.ohiolink.edu/apexprod/rws_etd/send_file/send?accession=ohiou1395341753&disposition=inline
- Aldowah**, H., Ghazali, S., Umar, I.N., Muniandy, B., 2017, The Impacts of Demographic Variables on Technological and Contextual Challenges of E-learning Implementation, *Journal of Physics: Conf. Series* 892 (2017) 012013, DOI:10.1088/1742-6596/892/1/012013
- Arbaugh**, J.B., 2002, Managing the on-line classroom: A study of technological and behavioral characteristics of web-based MBA courses, *Journal of High Technology Management Research*, 13, pp 203–223, DOI: 10.1016/S1047-8310(02)00049-4.
- Arbaugh**, J. B., 2008, Does the community of inquiry framework predict outcomes in online MBA courses? *The International Review of Research in Open and Distributed Learning*, 9(2) pp1-21, <https://files.eric.ed.gov/fulltext/EJ801088.pdf>
- Arbaugh**, J.B., 2018, Republication of “Virtual Classroom Characteristics and Student Satisfaction with Internet-Based MBA Courses”, *Journal of Management Education* 2018, Vol. 42(4) 533– 556, DOI: 10.1177/1052562918770400
- Arbaugh**, J. B., & Hwang, A. ,2006, Does “teaching presence” exist in online MBA courses? , *The Internet and Higher Education*, vol. 9, issue 1, pp 9-21. DOI: 10.1016/j.iheduc.2005.12.001
- Arbaugh**, J.B., Cleveland-Innes, M., Diaz, S. R., Garrison, D. R., Ice, P., & Richardson, J. C. (2008). Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *The Internet and Higher Education*, 11, 133–136. DOI: 10.1016/j.iheduc.2008.06.003
- Barczyk**, C.C., Hixon, E. Buckenmeyer, J., Ralston-Berg, P., 2017, The Effect of Age and Employment on Students’ Perceptions of Online Course Quality, *American Journal of Distance Education*, 31:3, 173-184, DOI: 10.1080/08923647.2017.1316151
- Davis**, F.D., Davis, F. 1989, Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, Vol. 13, No. 3 (Sep., 1989), pp. 319-340, DOI: 10.2307/249008
- Ebner**, C., Gegenfurtner, A., 2019, Learning and Satisfaction in Webinar, Online, and Face-to-Face Instruction: A Meta-Analysis. *Frontiers in Education*. Volume 4, Article 92., DOI: 10.3389/educ.2019.00092
- Francescucci**, A. and Rohani, L. 2018, Exclusively Synchronous Online (VIRI) Learning: The Impact on Student Performance and Engagement Outcomes, *Journal of Marketing Education* 2019, Vol. 41(1) 60– 69, DOI: 10.1177/0273475318818864
- Garrison**, D. R., Anderson, T., & Archer, W., 2001, Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education*, 15(1), 7-23, DOI: 10.1080/08923640109527071
- Garrison**, D. R., & Cleveland-Innes, M., 2005, Facilitating cognitive presence in online learning: Interaction is not enough. *The American Journal of Distance Education*, 19(3), 133-148, <https://inquirygroup.edublogs.org/files/2007/10/cognitivepresence2005.pdf>
- Garrison**, R.D., Arbaugh, J.B., 2007, Researching the community of inquiry framework: Review, issues, and future directions, *Internet and Higher Education* 10 (2007) 157–172, DOI: 10.1016/j.iheduc.2007.04.001
- Garrison**, D.R., Cleveland-Innes, M., Fung, T.S., 2010, Exploring causal relationships among teaching, cognitive and social presence: Student perceptions of the community of inquiry framework, *The Internet and Higher Education*, Volume 13, Issues 1–2, January 2010, Pages 31-36, DOI: 10.1016/j.iheduc.2009.10.002
- Giannousi**, M., Kioumourtoglou, E., 2016, Cognitive, Social, and Teaching Presence as Predictors of Students' Satisfaction in Distance Learning, *Mediterranean Journal of Social Sciences*, Vol 7, No 2, S1, pp 439-447, DOI:10.5901/mjss.2016.v7n2s1p439



- James, W.B., Gardner, D.L.**, 1995, Learning styles: Implications for distance learning, *New Directions for Adult and Continuing Education*, Volume 67, pp 19-31, DOI: 10.1002/ace.36719956705
- Johnston, R., Jones, K., Manley, D.**, 2018, Confounding and collinearity in regression analysis: a cautionary tale and an alternative procedure, illustrated by studies of British voting behavior, *Qual Quant.*, volume 52, issue 4, pp 1957-1976, DOI: 10.1007/s11135-017-0584-6
- Joo, Y.J., Lim, K.Y., Kim, E.K.**, 2011, Online university students' satisfaction and persistence: Examining perceived level of presence, usefulness and ease of use as predictors in a structural model, *Computers & Education* 57, pp 1654-1664, DOI: 10.1016/j.compedu.2011.02.008
- Kaparounaki, C.K., Patsali, M.E., Ka, Mousa, D.P.V., Papadopoulou, E.V.K., Papadopoulou, K.K.K., Fountoulakis K.N.**, 2020, University students' mental health amidst the COVID-19 quarantine in Greece, *Psychiatry Research*, Volume 290, 113111, DOI: 10.1016/j.psychres.2020.113111
- Kumar S. & Ritzhaupt A.D.**, 2014, Adapting the Community of Inquiry Survey for an Online Graduate Program: implications for online programs E-Learning and Digital Media, Volume 11, Number 1, p59-71, DOI: 10.2304/elea.2014.11.1.59
- Lee, R., Faulkner, M.** 2010, The roles of extrinsic factors in a community of inquiry model of e-learning, *Occasional Papers on Learning and Teaching at UniSA – Paper 6*, DOI: 10.2304/elea.2011.8.1.58
- Lim, J., Richardson, J.C.**, 2021, Predictive effects of undergraduate students' perceptions of social, cognitive, and teaching presence on affective learning outcomes according to disciplines, *Computers & Education*, 161, DOI: 10.1016/j.compedu.2020.104063
- MacKinnon, D.P., Luecken, L.J.**, 2012, Statistical analysis for identifying mediating variables in public health dentistry interventions, *Journal of Public Health Dentistry* 71, S37–S46 DOI: 10.1111/j.1752-7325.2011.00252.x
- Marks, R.B., Sibley, S.B., Arbaugh, J. B.**, 2005, A structural equation model of predictors for effective online learning, *Journal of management education*, Vol. 29, No. 4, 531-563, DOI: 10.1177/1052562904271199
- Pardisa, S.T., Sofiana, S., Abdullah, D.F., Tabriz, A.A.** (2017) *Board Intellectual Capital, Board Effectiveness and Corporate Performance: Goodness of the Data*. In: *Social Sciences Postgraduate International Seminar (SSPIS) 2017*. School of Social Sciences, USM, Pulau Pinang, Malaysia, pp. 494-502. <http://eprints.usm.my/id/eprint/40793>
- Peterson, R.A.**, 1994, A Meta-Analysis of Cronbach's Coefficient Alpha, *Journal of Consumer Research*, volume 21(2), pp 381-91, DOI: 10.1086/209405
- Prestiadi, D., Maisyaroh, M., Arifin, I., Bhayangkara, A.N.**, 2020, Meta-Analysis of Online Learning Implementation in Learning Effectiveness, 6th International Conference on Education and Technology (ICET), DOI: 10.1109/ICET51153.2020.9276557
- Richardson, J., & Swan, K.** (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *JALN* Volume 7(1), p68-88, <http://actxlearning.pbworks.com/f/10.1.1.119.9339.pdf>
- Richardson, J. C., Maeda, Y., Lv, J., Caskurlu, S.** (2017). Social presence in relation to students' satisfaction and learning in the online environment: A meta-analysis. *Computers in Human Behavior*, 71, 402-417, DOI: 10.1016/j.chb.2017.02.001
- Sarker, S., Jennifer Nicholson, J.**, 2005, Exploring the Myths about Online Education in Information Systems, *Informing Science Journal*, Volume 8, pp. 055-073, DOI: 10.28945/486
- Shea, P., & Bidjerano, T.**, 2009, Community of inquiry as a theoretical framework to foster “epistemic engagement” and “cognitive presence” in online education. *Computers & Education*, 52(3), 543–553, DOI: 10.1016/j.compedu.2008.10.007
- Sobel M.E.**, 1982, Asymptotic confidence intervals for indirect effects in structural equation models, *Sociological Methodology*, Vol. 13, pp. 290-312, <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.452.5935&rep=rep1&type=pdf> Calculation for the Sobel Test, <http://quantpsy.org/sobel/sobel.htm>, March 2022
- Stenbom S.**, 2018, A systematic review of the Community of Inquiry survey, *The Internet and Higher Education*, volume 39, pp 22–32, DOI: 10.1016/j.iheduc.2018.06.001



Swan, K., Richardson, J. C., Ice, P., Garrison, D. R., Cleveland-Innes, M., & Arbaugh, J. B. (2008). Validating a measurement tool of presence in online communities of inquiry. *E-mentor*, 2(24), 1–12, https://www.researchgate.net/publication/265406073_Validating_a_Measurement_Tool_of_Presence_in_Online_Communities_of_Inquiry

The Community of Inquiry, CoI Framework, <https://coi.athabasca.ca/coi-model/>, March 2022

UNESCO. (2020), COVID-19 educational disruption and response. URL: <https://en.unesco.org/themes/educationemergencies/coronavirus-school-closures>, March 2022



APPENDIX A: DIAGRAMS

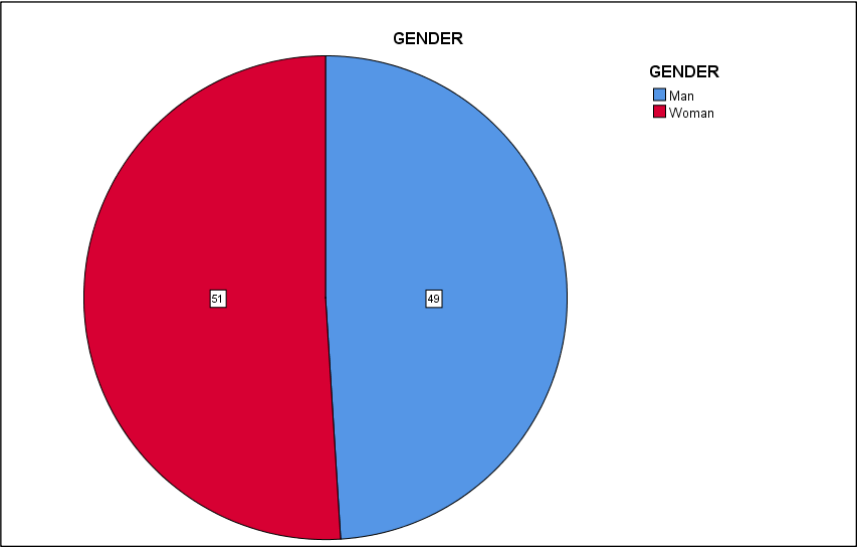


Figure 3: Gender

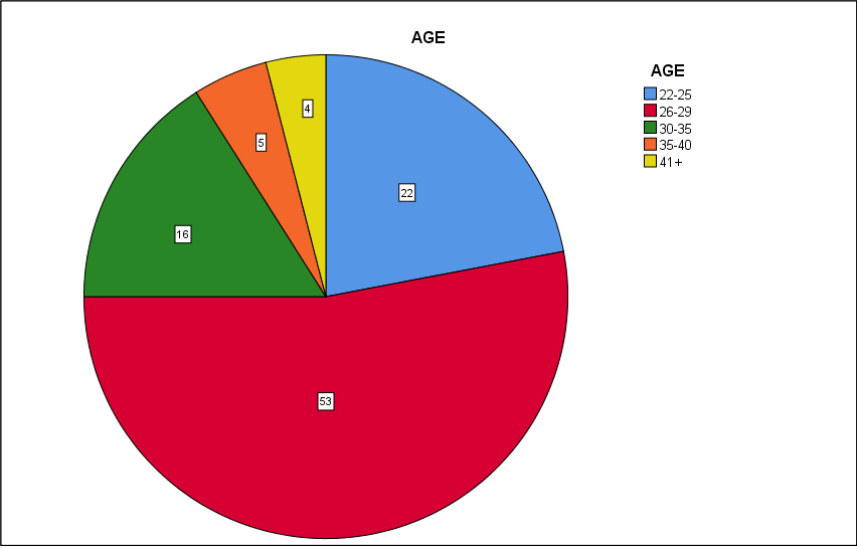


Figure 4: Age



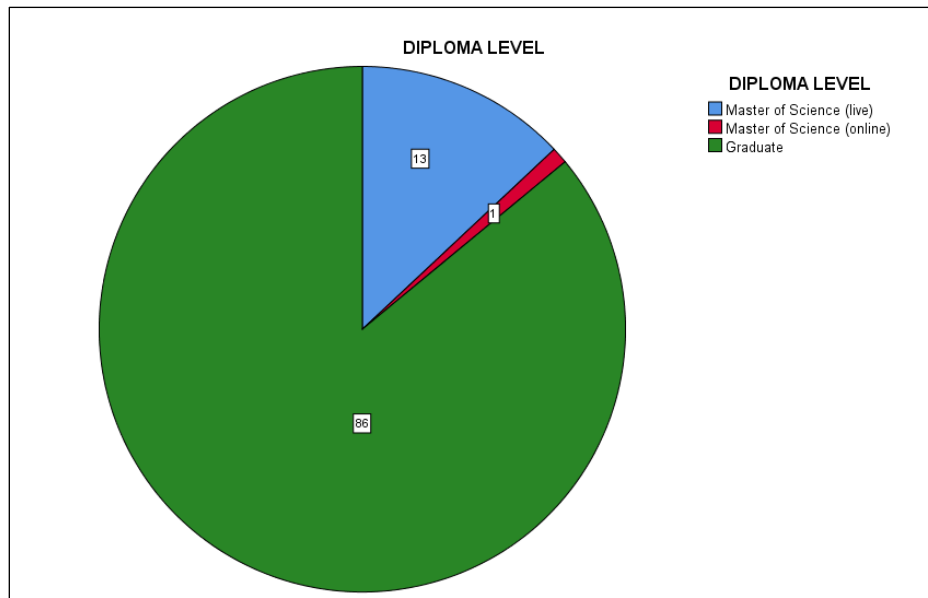


Figure 5: Diploma level

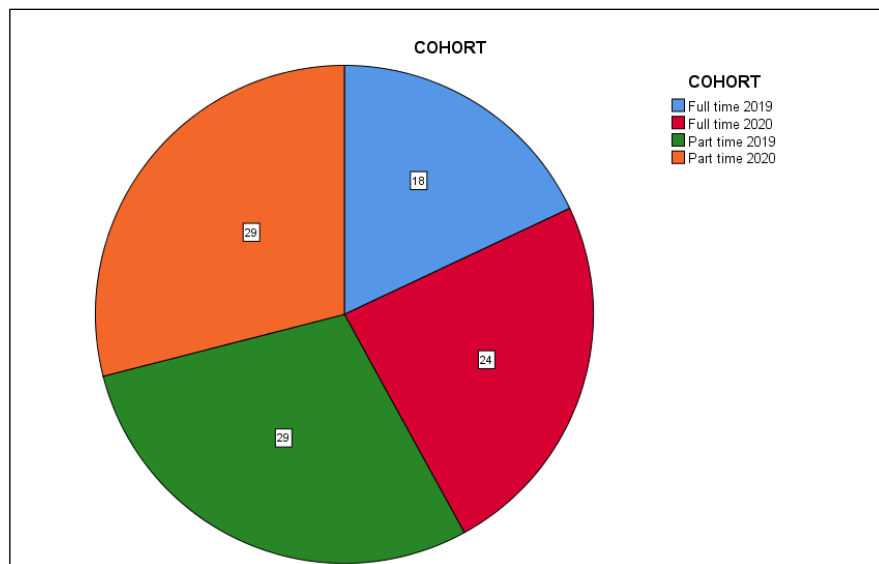


Figure 6: Cohort

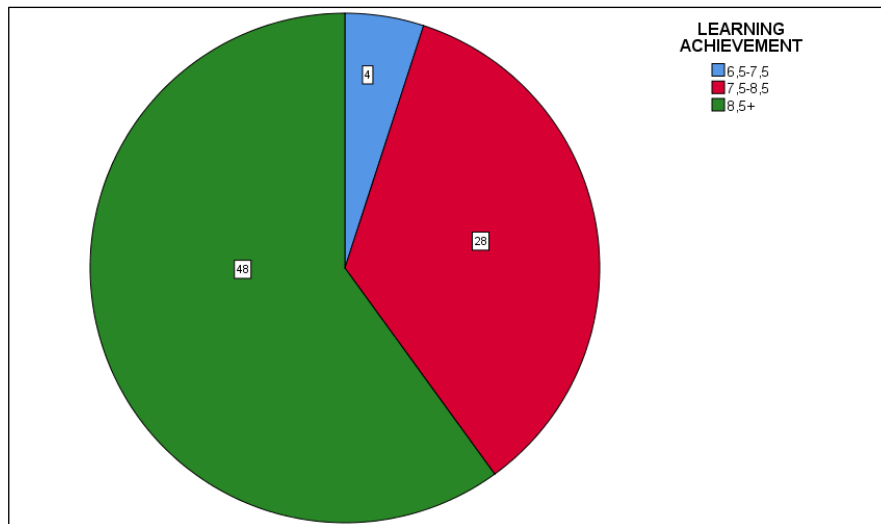


Figure 7: Learning achievement

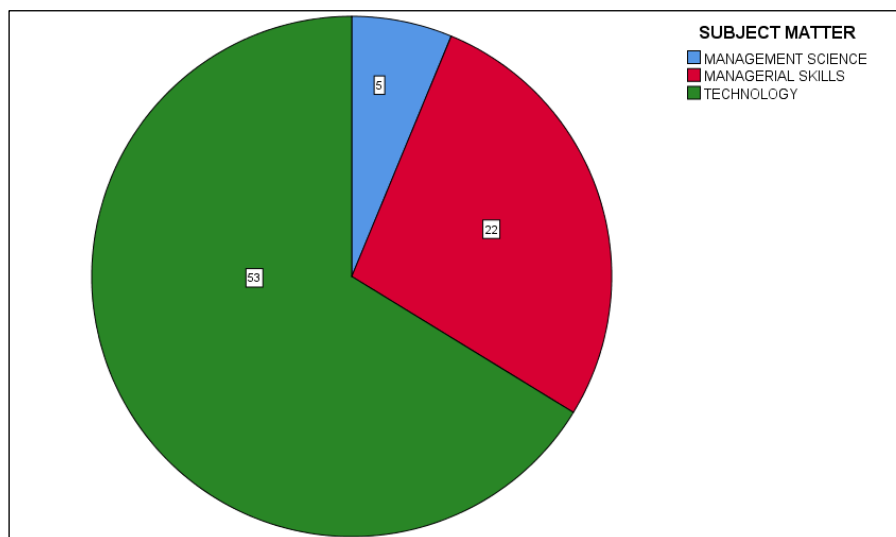


Figure 8: MST subject matter

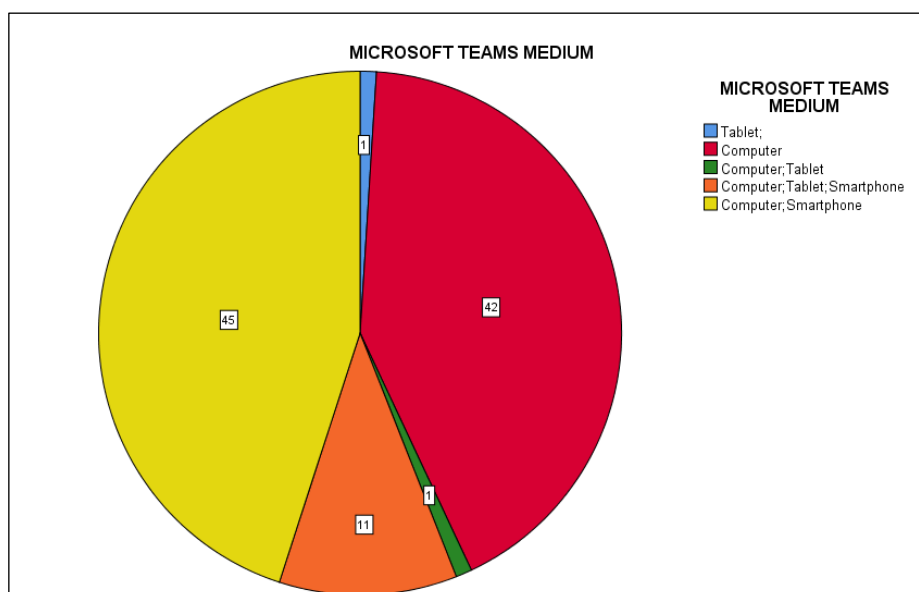


Figure 9: MS TEAMS MEDIUM

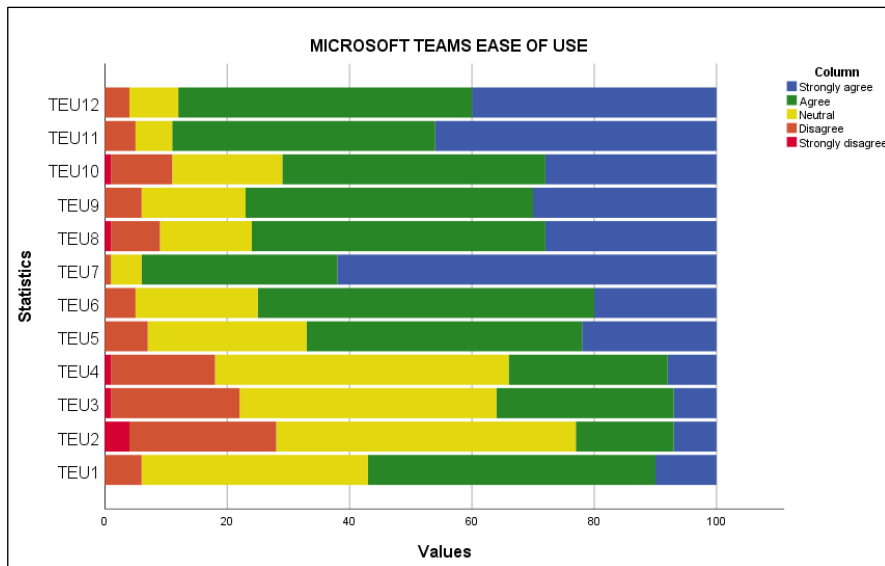


Figure 10:MS Teams Ease-of-use

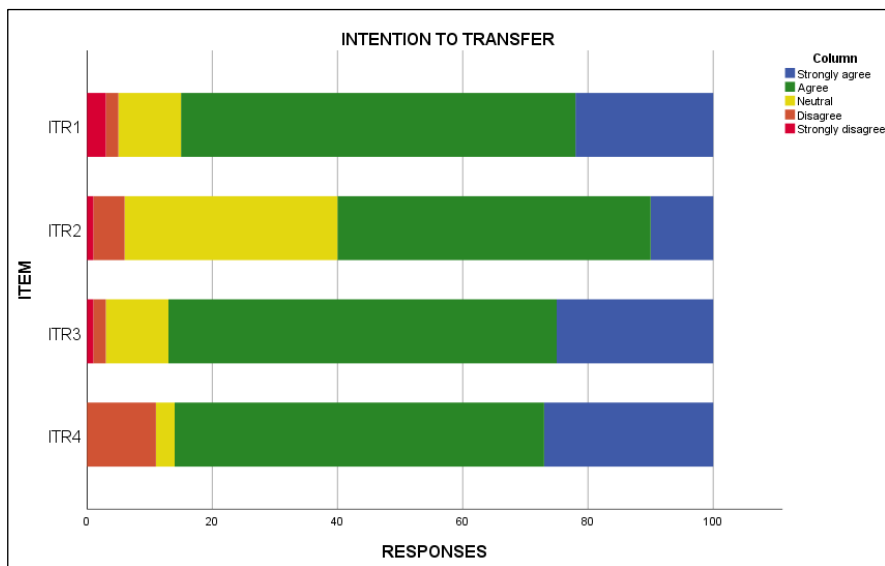


Figure 11: INTENTION TO TRANSFER BAR CHART



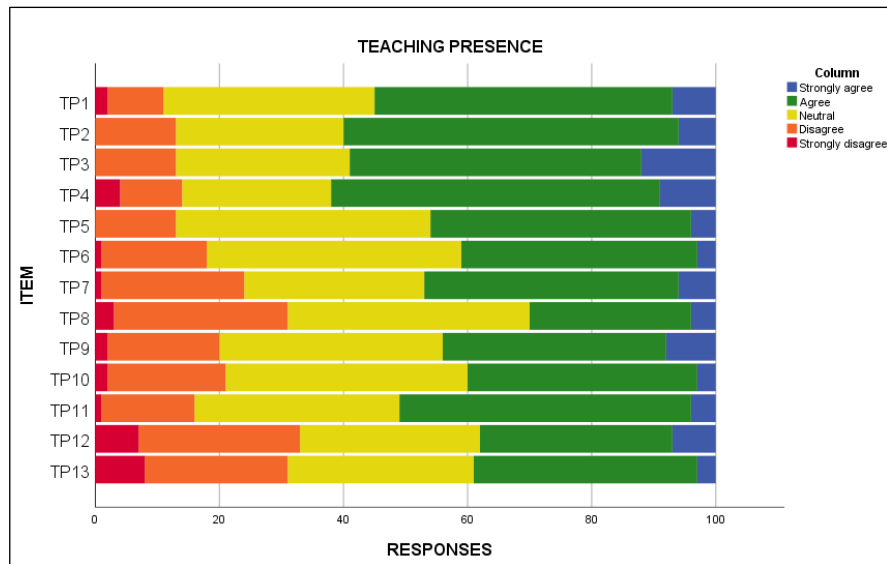


Figure 12: TEACHING PRESENCE BAR CHART

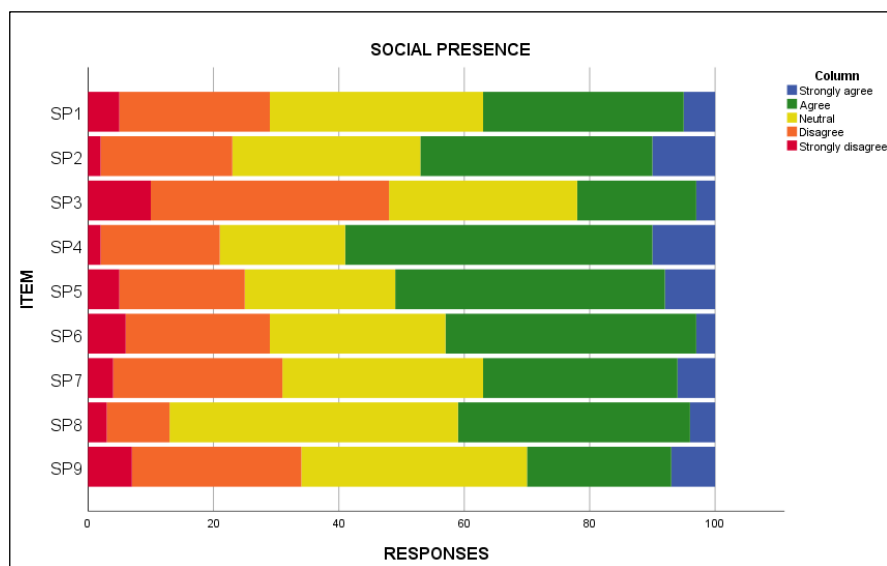


Figure 13: SOCIAL PRESENCE BAR CHART

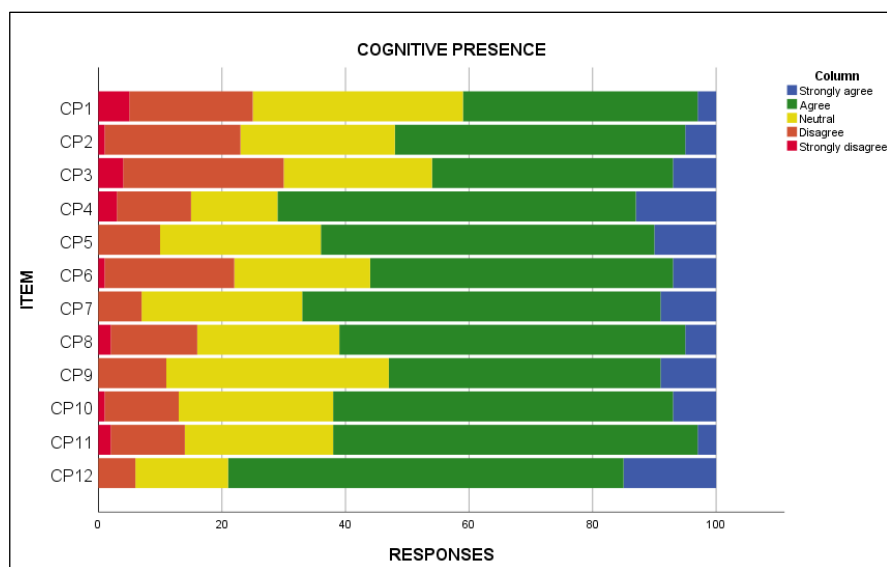


Figure 11: COGNITIVE PRESENCE BAR CHART



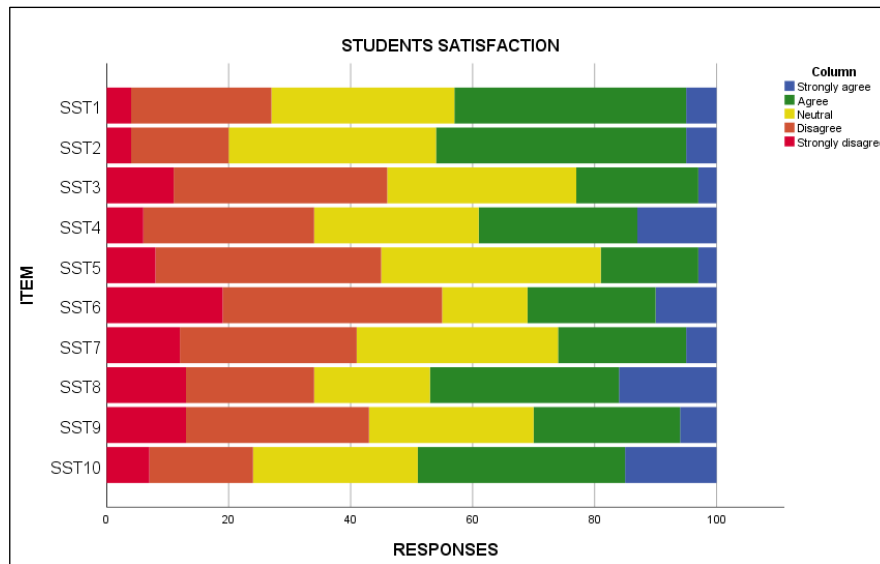


Figure 15: STUDENTS SATISFACTION BAR CHART

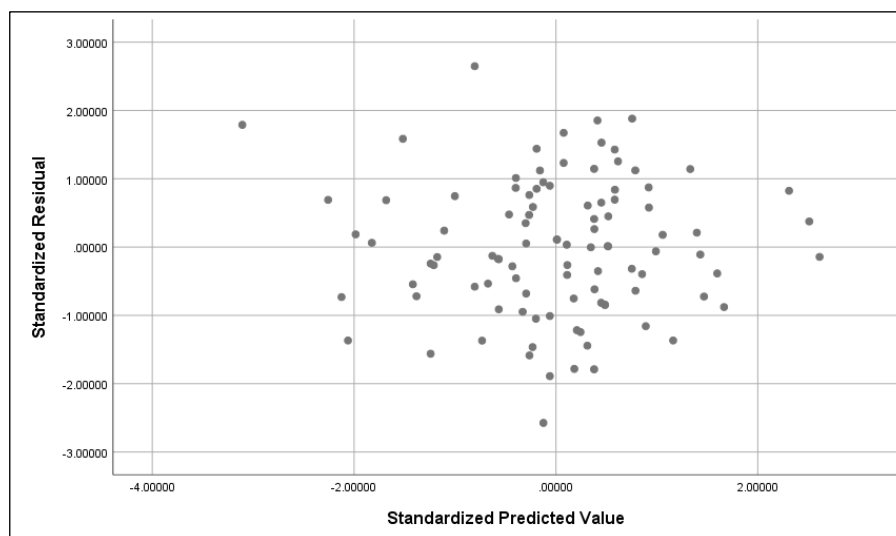


Figure 12: Homoscedasticity of residuals - STUDENTS SATISFACTION

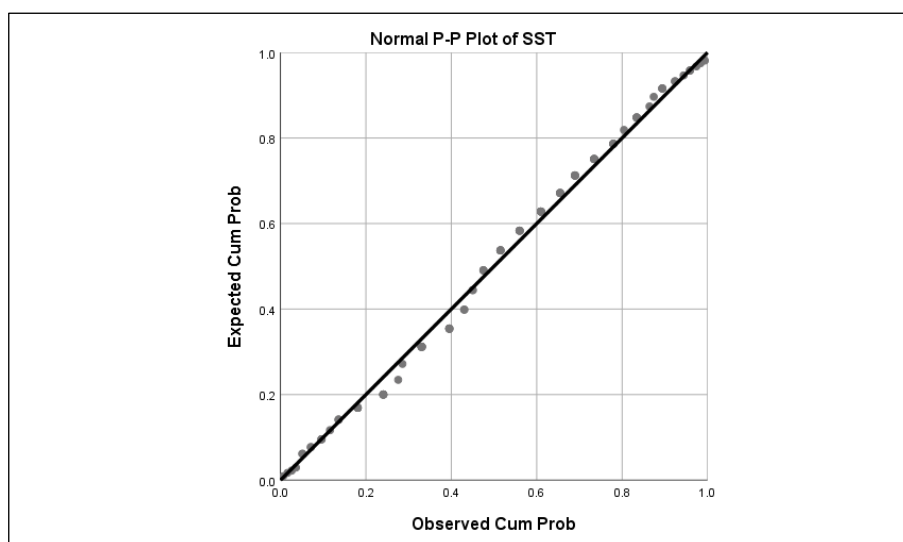


Figure 13: Normality P-P plot - STUDENTS SATISFACTION



APPENDIX B: QUESTIONNAIRS

CoI Framework Instrument

Teaching Presence

1. The instructor clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participants on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.
13. The instructor provided feedback in a timely fashion.

Social Presence

14. Getting to know other course participants gave me a sense of belonging in the course.
15. I was able to form distinct impressions of some course participants.
16. Online or web-based communication is an excellent medium for social interaction.
17. I felt comfortable conversing through the online medium.
18. I felt comfortable participating in the course discussions.
19. I felt comfortable interacting with other course participants.
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.
21. I felt that my point of view was acknowledged by other course participants.
22. Online discussions help me to develop a sense of collaboration.

Cognitive Presence

23. Problems posed increased my interest in course issues.
24. Course activities piqued my curiosity.
25. I felt motivated to explore content related questions.
26. I utilized a variety of information sources to explore problems posed in this course.
27. Brainstorming and finding relevant information helped me resolve content related questions.
28. Online discussions were valuable in helping me appreciate different perspectives.
29. Combining new information helped me answer questions raised in course activities.
30. Learning activities helped me construct explanations/solutions.



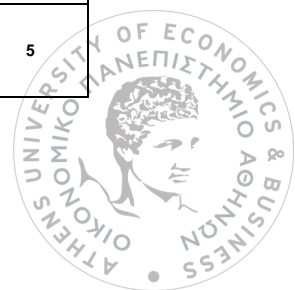
31. Reflection on course content and discussions helped me understand fundamental concepts in this class.
32. I can describe ways to test and apply the knowledge created in this course.
33. I have developed solutions to course problems that can be applied in practice.
34. I can apply the knowledge created in this course to my work or other non-class related activities.

Perceived Student Satisfaction

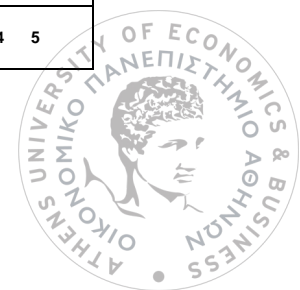
- 1.I am satisfied with my decision to take this course via the Internet. (excluded)
- 2.If I had an opportunity to take another course via the Internet, I would gladly do so.
- 3.My choice to take this course via the Internet was a wise one. (excluded)
- 4.I was very satisfied with this course.
- 5.I feel that this course served my needs well.
- 6.Conducting the course via the Internet improved the quality of the course compared to other MBA courses.
- 7.I will take as many courses via the Internet as I can.
- 8.The quality of the course compared favorably to my other MBA courses.
- 9.I feel the quality of the course I took was largely unaffected by conducting it via the Internet.
- 10.I was disappointed with the way this course worked out (reverse coded).
- 11.If I had it to do over, I would not take this course via the Internet (reverse coded).
- 12.Conducting the course via the Internet made it more difficult than other MBA courses I have taken (reverse coded).

Present Research Translated Questionnaire

CONSTRAINTS AND ITEMS	1 = strongly disagree; 5 = strongly agree
Teaching Presence - TP	
TP1 Κατά τη διδασκαλία, τα σημαντικά θέματα των μαθημάτων επικοινωνούνταν με σαφήνεια.	1 2 3 4 5
TP2 Κατά τη διδασκαλία, οι σημαντικοί στόχοι των μαθημάτων επικοινωνούνταν με σαφήνεια.	1 2 3 4 5
TP3 Κατά τη διδασκαλία, παρέχονταν σαφείς οδηγίες για τον τρόπο συμμετοχής στις μαθηματικές δραστηριότητες.	1 2 3 4 5
TP4 Καθ' όλη τη διάρκεια των μαθημάτων, οι προθεσμίες των μαθησιακών δραστηριοτήτων ανακοινώνονταν με σαφήνεια.	1 2 3 4 5
TP5 Σημαντικά σημεία συμφωνίας και διαφωνίας μπορούσαν να αναγνωριστούν με τη βοήθεια των διδασκόντων, γεγονός που με βοήθησε να μάθω.	1 2 3 4 5
TP6 Καθ' όλη την διάρκεια των μαθημάτων, η τάξη καθοδηγούνταν για την κατανόηση θεμάτων των μαθημάτων με τρόπο που με βοήθησε να ξεκαθαρίσω τη σκέψη μου.	1 2 3 4 5
TP7 Καθ' όλη τη διάρκεια των μαθημάτων, η εμπλοκή των συμμετεχόντων και η συμμετοχή σε παραγωγικό διάλογο διατηρούνταν με τη βοήθεια των διδασκόντων.	1 2 3 4 5
TP8 Καθ' όλη τη διάρκεια των μαθημάτων, οι συμμετέχοντες παρέμεναν απασχολημένοι με τρόπο που με βοήθησε να μάθω.	1 2 3 4 5
TP9 Καθ' όλη τη διάρκεια των μαθημάτων, οι συμμετέχοντες ενθαρρύνονταν να εξερευνήσουν νέες ιδέες στα μαθήματα.	1 2 3 4 5
TP10 Οι ενέργειες των διδασκόντων ενίσχυαν την ανάπτυξη μιας αίσθησης κοινότητας μεταξύ των συμμετεχόντων των μαθημάτων	1 2 3 4 5
TP11 Οι διδάσκοντες βοηθούσαν να εστιάσει η συζήτηση σε σχετικά θέματα με τρόπο που με βοήθησε να μάθω.	1 2 3 4 5
TP12 Καθ' όλη τη διάρκεια των μαθημάτων, η ανατροφοδότηση από τους διδάσκοντες με βοήθησε να κατανοήσω τα δυνατά και αδύνατα σημεία μου σε σχέση με τους σκοπούς και τους στόχους των μαθημάτων.	1 2 3 4 5



TP13 Η ανατροφοδότηση ήταν έγκαιρη καθ' όλη τη διάρκεια των μαθημάτων.	1	2	3	4	5
Social Presence- SP					
SP1 Η γνωριμία με άλλους συμμετέχοντες στα μαθήματα μου έδινε μια αίσθηση ότι ανήκω στα μαθήματα.	1	2	3	4	5
SP2 Μπόρεσα να διαμορφώσω ξεχωριστές εντυπώσεις για ορισμένους συμμετέχοντες στα μαθήματα.	1	2	3	4	5
SP3 Η ηλεκτρονική ή διαδικτυακή επικοινωνία είναι ένα εξαιρετικό μέσο κοινωνικής αλληλεπίδρασης.	1	2	3	4	5
SP4 Ένιωθα άνετα να συνομιλώ μέσω του ηλεκτρονικού μέσου.	1	2	3	4	5
SP5 Ένιωθα άνετα να συμμετέχω στις συζητήσεις των μαθημάτων.	1	2	3	4	5
SP6 Ένιωθα άνετα να αλληλεπιδρώ με άλλους συμμετέχοντες στα μαθήματα.	1	2	3	4	5
SP7 Ένιωθα άνετα να διαφωνώ με άλλους συμμετέχοντες στα μαθήματα, διατηρώντας παράλληλα μια αίσθηση εμπιστοσύνης.	1	2	3	4	5
SP8 Ένιωθα ότι η άποψή μου αναγνωρίστηκε από άλλους συμμετέχοντες στα μαθήματα.	1	2	3	4	5
SP9 Οι ηλεκτρονικές συζητήσεις με βοήθησαν να αναπτύξω μια αίσθηση συνεργασίας.	1	2	3	4	5
Cognitive Presence- CP					
CP1 Τα προβλήματα που τέθηκαν αύξαναν το ενδιαφέρον μου σε θέματα των μαθημάτων.	1	2	3	4	5
CP2 Οι δραστηριότητες των μαθημάτων κινούσαν την περιέργειά μου.	1	2	3	4	5
CP3 Ένιωθα παρακίνηση για να εξερευνήσω ερωτήσεις σχετικά με το περιεχόμενο των μαθημάτων.	1	2	3	4	5
CP4 Χρησιμοποίησα διαφορετικές πηγές πληροφοριών για να διερευνήσω προβλήματα που τέθηκαν σε αυτό τα μαθήματα.	1	2	3	4	5
CP5 Η ανταλλαγή ιδεών και η εύρεση σχετικών πληροφοριών με βοηθούσαν να επιλύω ερωτήσεις σχετικά με το περιεχόμενο των μαθημάτων.	1	2	3	4	5
CP6 Οι ηλεκτρονικές συζητήσεις ήταν πολύτιμες βοηθώντας με να εκτιμήσω διαφορετικές οπτικές.	1	2	3	4	5
CP7 Ο συνδυασμός νέων πληροφοριών με βοηθούσε να απαντήσω σε ερωτήσεις που τέθηκαν στις δραστηριότητες των μαθημάτων.	1	2	3	4	5
CP8 Οι μαθησιακές δραστηριότητες με βοηθούσαν στο να δομήσω εξηγήσεις και λύσεις.	1	2	3	4	5
CP9 Ο αναστοχασμός σχετικά με το περιεχόμενο των μαθημάτων και οι συζητήσεις με βοηθούσε να κατανοήσω θεμελιώδεις έννοιες στα μαθήματα.	1	2	3	4	5
CP10 Μπορώ να περιγράψω τρόπους αξιολόγησης και εφαρμογής των γνώσεων που αποκτήθηκαν στα μαθήματα.	1	2	3	4	5
CP11 Είχα αναπτύξει λύσεις σε προβλήματα των μαθημάτων που μπορούν να εφαρμοστούν στην πράξη.	1	2	3	4	5
CP12 Μπορώ να εφαρμόσω τις γνώσεις που αποκτήθηκαν στα μαθήματα στη δουλειά μου ή σε άλλες σχετικές δραστηριότητες εκτός τάξης.	1	2	3	4	5
Student Satisfaction - SST					
SST1 Ήμουν πολύ ικανοποιημένος με αυτά τα μαθήματα.	1	2	3	4	5
SST2 Αισθάνομαι ότι αυτά τα μαθήματα ανταποκρίθηκαν καλά στις ανάγκες μου.	1	2	3	4	5
SST3 Η διεξαγωγή των μαθημάτων μέσω του διαδικτύου βελτίωσε την ποιότητα των μαθημάτων σε σύγκριση με άλλα μαθήματα του πτυχίου μου.	1	2	3	4	5
SST4 Θα παρακολουθούσα όσο περισσότερα μαθήματα μέσω του διαδικτύου μπορώ.	1	2	3	4	5
SST5 Η ποιότητα των μαθημάτων ήταν καλύτερη σε σύγκριση με άλλα μαθήματα του πτυχίου μου.	1	2	3	4	5
SST6 Αισθάνομαι ότι η ποιότητα των μαθημάτων δεν επηρεάστηκε από το γεγονός ότι διεξήχθησαν μέσω του διαδικτύου.	1	2	3	4	5
SST7 Απογοητεύτηκα με τον τρόπο που λειτούργησαν αυτά τα μαθήματα.	1	2	3	4	5
SST8 Αν χρειαζόταν να ξανακάνω τα μαθήματα, δε θα το έκανα μέσω του διαδικτύου.	1	2	3	4	5
SST9 Η διεξαγωγή αυτών των μαθημάτων μέσω του διαδικτύου το έκανε πιο δύσκολο από άλλα μαθήματα που έχω κάνει.	1	2	3	4	5



SST10 Εάν είχα την ευκαιρία να παρακολουθήσω κι άλλο μάθημα μέσω του διαδικτύου, θα το έκανα ευχαρίστως.	1	2	3	4	5
Intention to Transfer - ITR					
ITR1 Σκοπεύω να χρησιμοποιήσω στην εργασία μου τις νέες γνώσεις και δεξιότητες που απέκτησα στα μαθήματα	1	2	3	4	5
ITR2 Προβλέπω να καταβάλω κάθε δυνατή προσπάθεια τις προσεχείς εβδομάδες για να εφαρμόσω αυτά που έμαθα στα μαθήματα	1	2	3	4	5
ITR3 Ο στόχος μου είναι να εφαρμόσω στην εργασία μου όσο περισσότερο μπορώ αυτά που έμαθα στα μαθήματα	1	2	3	4	5
ITR4 Μόλις είναι εφικτό, σκοπεύω να χρησιμοποιήσω στην εργασία μου όλα όσα έμαθα στα μαθήματα.	1	2	3	4	5

Filters	
Gender	Female, Male
Age	22-25,26-29,30-35,36-40,41+
Program	MST, BA, HR
Cohort	Part 2019, Full 2019, Part 2020, Full 2020
Courses	MST Courses List
Grades	5-6.5, 6.5-7.5, 7.5-8.5,8.5+
Educational experience	Graduate, Master, Distance learning Master, PhD
Technology ease of use	
TEU1 Η χρήση του Microsoft Teams στις σπουδές μου δίνει τη δυνατότητα να ολοκληρώσω εργασίες πιο γρήγορα από άλλες εφαρμογές	1 2 3 4 5
TEU2 Η χρήση του Microsoft Teams αύξησε την απόδοση στις σπουδές μου	1 2 3 4 5
TEU3 Η χρήση του Microsoft Teams αύξησε την παραγωγικότητα στις σπουδές μου	1 2 3 4 5
TEU4 Η χρήση του Microsoft Teams ενίσχυσε την αποτελεσματικότητα στις σπουδές μου	1 2 3 4 5
TEU5 Η χρήση του Microsoft Teams διευκόλυνε τις σπουδές μου	1 2 3 4 5
TEU6 Το Microsoft Teams ήταν χρήσιμο στις σπουδές μου	1 2 3 4 5
TEU7 Το να μάθω να χρησιμοποιώ το Microsoft Teams ήταν εύκολο για μένα	1 2 3 4 5
TEU8 Μου ήταν εύκολο να κάνω όσα ήθελα με το Microsoft Teams	1 2 3 4 5
TEU9 Η αλληλεπίδρασή μου με το Microsoft Teams ήταν κατανοητή και ξεκάθαρη	1 2 3 4 5
TEU10 Το Microsoft Teams ήταν ευέλικτο για αλληλεπίδραση.	1 2 3 4 5
TEU11 Ήταν εύκολο για μένα να χειρίζομαι επιτυχώς το Microsoft Teams	1 2 3 4 5
TEU12 Το Microsoft Teams ήταν εύκολο στη χρήση	1 2 3 4 5
Medium used	Ηλεκτρονικό Υπολογιστή, Κινητό τηλέφωνο, Tablet



APPENDIX C: TABLES

Scale item	Cronbach's Alpha if Item Deleted	Scale item	Cronbach's Alpha if Item Deleted	Scale item	Cronbach's Alpha if Item Deleted	Scale item	Cronbach's Alpha if Item Deleted	Scale item	Cronbach's Alpha if Item Deleted
TP1	.885	SP1	.859	CP1	.884	SST1	.921	ITR1	.713
TP2	.887	SP2	.867	CP2	.878	SST2	.925	ITR2	.833
TP3	.888	SP3	.874	CP3	.874	SST3	.922	ITR3	.686
TP4	.886	SP4	.843	CP4	.884	SST4	.920	ITR4	.758
TP5	.886	SP5	.839	CP5	.875	SST5	.925		
TP6	.882	SP6	.842	CP6	.883	SST6	.925		
TP7	.883	SP7	.847	CP7	.874	SST7	.919		
TP8	.883	SP8	.850	CP8	.873	SST8	.917		
TP9	.887	SP9	.849	CP9	.879	SST9	.924		
TP10	.883			CP10	.881	SST10	.916		
TP11	.886			CP11	.888				
TP12	.888			CP12	.882				
TP13	.889								

Table 22: Cronbach's alpha for items if deleted

