Improving the Interaction and Communication through the LMS Open eClass in Blended Learning

Author: Despina Fyntanoglou
Elissavet Kartaloglou
Supervisor: Håkan Sterner
Examiner: Christina Mörtberg
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Abstract

Learning Management Systems (LMSs), in a blended learning educational environment, support face to face education and enable enhanced communication and interaction among instructors and students as well as among students. However, Technology-Enhanced Learning (TEL), which improves the learning process, does not come without challenges. The aim of this research is double fold. Firstly, it aims to explore users’ –instructors and students- perceptions on how the LMS Open eClass, in TEI of Athens Greece, supports and facilitates their communication and interaction. Secondly, based on users’ needs and desires, the study aims to formulate suggestions for improving communication and interaction through the platform. The study adopts an interpretivist stance and is built upon an inductive qualitative approach. Firstly, users’ perceptions are solicited through semi-structured interviews and the collected data are analyzed through the thematic analysis method. Subsequently, the study adopts Soft Systems Methodology (SSM) to capture the complexity of the situation, derived from the different worldviews of instructors and students in their association with Open eClass and emerge suggestions for improvements. The results indicate that Open eClass is used to facilitate instructors convey material and information to students, while neither meaningful communication and interaction nor collaboration is performed adequately through the platform. However, the users have expressed a positive disposition towards utilizing these capabilities of the platform, as they recognize their fundamental importance to learning, especially during an economic crisis which constraints the physical presence of many students in classes. Therefore, the study proposes three, accommodating to all, systemically desirable and culturally feasible changes that could improve the situation, mainly based on pedagogy. Overall, this research contributes to existing knowledge about the usage of LMS regarding interaction and communication in a blended learning environment by providing a holistic view on users’ perceptions and identifying changes capable to bring about improvements.

Keywords: Soft Systems Methodology (SSM), Blended Learning, Learning Management System (LMS), Technology-Enhanced Learning (TEL), Learning Theories, Interaction, Communication, Computer-Supported Collaborative Learning (CSCL), Open eClass, Greece.
Acknowledgements

“As you set out for Ithaka
hope the voyage is a long one,
full of adventure, full of discovery........
And if you find her poor, Ithaka won’t have fooled you.
Wise as you will have become, so full of experience,
you will have understood by then what these Ithakas mean”.

(C.P. Cavafy, *Ithaka*. Translated by Edmund Keeley and Philip Sherrard).

Constantine P. Cavafy (1863-1933), a well-known Greek poet, reflected in a unique way on a journey through obstacles, challenges, agonies and disappointments, to emerge that it is not reaching a goal per se that matters, but rather the wisdom that is gained from encountering the challenges of the journey. Looking back, after reaching our “Ithaka”, firstly we appreciated “sailing” together in rough seas with an important asset; our recently established but strong friendship. Our mutual encouragement and support along with a mutual motivation to excel made this “journey” not only possible, but also enjoyable.

Our supervisor Håkan Sterner challenged us to perform our best and provided us with constructive feedback and valuable comments that were instrumental in carrying out the task in a coherent, solid and detailed manner. Thank you, Håkan!

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Last but not least, we would like to dedicate our -hopefully- ambitious work to our children Dimitris, Giorgos and Maria. We hope that we have set a good example for them to follow.
# Contents

1. Introduction ........................................................................................................ 1  
   1.1  Background ........................................................................................................ 1  
   1.2  Related Studies .................................................................................................. 2  
   1.3  Problem Statement ............................................................................................. 4  
   1.4  Purpose and Research Questions ........................................................................ 4  
   1.5  Topic Justification .............................................................................................. 5  
   1.6  Scope and Limitations ....................................................................................... 5  
   1.7  Responsibility of the Work ................................................................................ 7  
   1.8  Disposition of the Thesis .................................................................................. 7  

2. Theoretical Framework ...................................................................................... 9  
   2.1  Blended Learning ............................................................................................... 9  
   2.2  Learning Theories .............................................................................................. 10  
   2.3  Technology-Enhanced Learning ........................................................................ 11  
   2.4  Interaction .......................................................................................................... 12  
   2.5  Computer-Mediated Communication ................................................................ 14  
   2.6  Computer-Supported Collaborative Learning .................................................. 14  
   2.7  Outline of Literature Relevance to the Study ..................................................... 16  

3. Methodology ..................................................................................................... 17  
   3.1  Philosophical Tradition ..................................................................................... 17  
   3.2  Research Setting ............................................................................................... 18  
   3.3  Methodological Approach ................................................................................ 19  
   3.4  Data Collection .................................................................................................. 26  
       3.4.1 Interview Process ......................................................................................... 27  
       3.4.2 Semi-Structured Interviews ......................................................................... 29  
       3.4.3 Workshops Process .................................................................................... 30  
   3.5  Data Analysis ..................................................................................................... 32  
       3.5.1 Analysis of Interview Data .......................................................................... 33  
       3.5.2 Analysis of the Workshops ......................................................................... 35  
   3.6  Trustworthiness of the Study ............................................................................ 35  
   3.7  Ethical Considerations ...................................................................................... 37  

4. Empirical Findings and Soft Systems Methodology Application ............... 39  
   4.1  Interviews Empirical Findings .......................................................................... 39  
   4.2  Overview of Interview Empirical Findings ....................................................... 51  
   4.3  SSM 1st activity - Finding Out about the Problematic Situation ..................... 54  
       4.3.1 Analysis One (the Intervention itself) .............................................................. 54  
       4.3.2 Analysis Two (Social) .................................................................................. 54  

iii
List of Figures

Figure 2.1 The TPACK framework (from http://tpack.org, Reproduced by permission of the publisher) ................................................................................................................................................................ 12
Figure 2.2 Framework of concepts adopted in the study ................................................................................................................................. 16
Figure 3.1 SSM cycle of learning for action (adapted from Checkland and Poulter, 2006, p. xix) ..........22
Figure 3.2 SSM stages (adapted from Checkland, 1989, p. 84) ......................................................................................................................... 24
Figure 3.3 SSM five activities (adapted from Checkland and Poulter, 2006, p. 62) ................................. 25
Figure 4.1 Students - Rich Picture................................................................................................................................................................. 57
Figure 4.2 Instructors - Rich Picture............................................................................................................................................................. 58
Figure 4.3 1st CM – to create a support group of experts................................................................................................. 62
Figure 4.4 2nd CM – to create a pilot course as a sample for experiential training............................................ 64
Figure 4.5 3rd CM – to produce video recorded training................................................................................................. 65
Figure 4.6 4th CM – to determine desired characteristics of Open eClass on a mobile app........................ 67
Figure 4.7 5th CM – to perform live video communication through Open eClass................................. 68

List of tables

Table 2.1 Effective Web-design concepts, (adapted from Janicki and Liegle, 2001, p.62) .................. 13
Table 3.1 Interviewees characteristics and interview specifics ......................................................................................... 28
Table 3.2 Workshops................................................................................................................................................................. 31
Table 4.1 Outline of the summary of interview findings per theme ......................................................................................... 53
Table 4.2 Outline of systemically desirable and culturally feasible changes......................................................... 76
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>Collaborative Learning</td>
</tr>
<tr>
<td>CM</td>
<td>Conceptual Model</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer-Mediated Communication</td>
</tr>
<tr>
<td>COI</td>
<td>Community of Inquiry</td>
</tr>
<tr>
<td>CSCL</td>
<td>Computer-Supported Collaborative Learning</td>
</tr>
<tr>
<td>GUnet</td>
<td>Greek Universities network</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>LMS</td>
<td>Learning Management Systems</td>
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<tr>
<td>MKO</td>
<td>More Knowledgeable Other</td>
</tr>
<tr>
<td>RD</td>
<td>Root Definition</td>
</tr>
<tr>
<td>SSM</td>
<td>Soft Systems Methodology</td>
</tr>
<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
</tr>
<tr>
<td>TEI</td>
<td>Technological Educational Institution</td>
</tr>
<tr>
<td>TEL</td>
<td>Technology-Enhanced Learning</td>
</tr>
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<td>TPACK</td>
<td>Technological Pedagogical Content Knowledge</td>
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<tr>
<td>ZPD</td>
<td>Zone of Proximal Development</td>
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1. Introduction

This chapter introduces the background of LMSs in a blended learning environment which relates to this study’s problem area. Subsequently, the presented related studies lead to the purpose and research questions of this research. The chapter concludes with the presentation of the justification of the topic, the scope and limitations of the study, the responsibility of the work and the disposition of the thesis.

1.1 Background

The evolution of Information and Communication Technology (ICT) and, specifically, the advent of internet has drastically impacted education and introduced changes in the traditional educational activities. It has been widely argued that the incorporation of these new technologies in the educational field has led to more efficient and effective teaching/learning practices (Green and Gilbert, 1995; Woo and Reeves, 2008).

An important aspect that contributed to innovative educational processes was the introduction of e-learning which supports learning activities with the use of technology. Nichols (2003) describes e-learning as Web-based, Web-distributed or Web-capable technological tools that are used in education. On the other hand, Triacca et al. (2004) argue that e-learning conveys contents, but also facilitates learning through interaction. Over the years, e-learning has become pervasive in the higher-education environment (Liaw, Huang and Chen, 2007) and geared educational orientation to focus on the learner regardless of place and time and with various instructor involvement levels (Graves, 2001). However, as Selwyn (2011, p.714) points out, educational technologies “are used inconsistently in educational settings, usually with little large-scale conclusive ‘effect’”.

The author argues that technology is a distraction from real issues concerning education and society. Along the same lines, Daniel (2007) argues that new technologies have little benefits to the quality of education, because most teachers continue their traditional education with fancier tools, which has increased the cost of education, while very few know how to use the available tools effectively. Although both stances represent the downfalls of technological incorporation in education, they don’t reject technology all together, but rather entice the in-depth investigation of the educational field to emerge good practices that should be adopted for an effective educational technological revolution.

E-learning is the general term that describes both blended learning and distance learning. In blended learning a course is taught face-to-face, while at the same time it is supported by online activities. The instructor teaches a course in a classroom setting usually once or twice a week, while functions, such as dissemination of teaching material and notes, exercises, some tests, discussions, questions/answers and collaborative student assignments, take place on-line in an asynchronous, synchronous or mixed setting. In distance learning a course is taught exclusively online and there is
no direct contact either between the students and the instructor or among students. Both blended learning and distance learning are the outgrowth of the rapid development and adoption of e-learning platforms, known as Learning Management Systems (LMS).

These internet based systems, such as WebCT, Blackboard and Moodle applications, have been a trend in the tertiary education, significantly affecting learning and teaching as well as changing the nature of learning experience (Coates, James and Baldwin, 2005). In the field of tertiary education in Greece, Open eClass has been introduced as the national blended learning LMS for the Universities. Open eClass is a customized version of the open source learning platform Claroline and is offered by the Greek Universities Network (GUnet) to support mainly asynchronous e-learning services for both instructors and students (Open eClass, n.d). Technological Educational Institution (TEI) of Athens has been using various LMSs that were created within departments for their use, mainly as repository systems, but the last two years a new recommendation from the management of TEI suggested the transfer of all activities to Open eClass as the official supplement to traditional education, ceasing the existence of all others. This platform is supported by a local administrator, while the instructors are responsible for the creation and administration of the online part of their courses. The students can access educational material and perform activities that have been given access to and specified by the instructors.

This study is conducted in TEI of Athens. Considering that learning and knowledge in general is better achieved through meaningful interaction and active participation (Picciano, 2002) and as Herse and Lee (2005, p.51) highlight “web-based learning tools can be used as a catalyst for self-reflection and to help facilitate change from passive to active learning”, we specifically concentrated on the Web-based interaction and communication between instructors and undergraduate students as well as among students. Specifically, we investigated the extent to which Web-based interaction and communication is achieved, identified the reasons for the diversity in its use and, based on both of them, provided suggestions that can improve the utilizations of these functions. Additionally, it should be clarified that we used the general term “instructors” to include the various levels of academic teaching positions ranging from lecturers to professors.

1.2 Related Studies

The LMS, as a supportive tool with high potentials for a traditional class in a blended learning setting, has been widely recognized (Hong, Ridzuan and Kuek, 2003; Buzzetto-More, 2008), however, there have been a lot of debates regarding the effectiveness of such a learning environment, if learning theories and pedagogical principles are not integrated (Hadjerrouit, 2008; Nichols, 2003). Specifically, Hadjerrouit (2008) describes the transition from cognitive learning to socially situated learning as a path which blended learning has to follow to achieve effectiveness.

Additionally, different student’s perceptions have been reported on the usefulness and usage of LMS in educational setting (Georgouli et al., 2006; Jamal and Shanaah, 2011; Vassilakis, Psaroudakis and Kalogiannakis, 2008; Landry, Griffeth and
Hartman, 2006). In these studies the researchers discuss the benefits of including LMS to traditional education and their importance in supporting instructors and students, but at the same time their findings revealed limited use of interaction and communication. However, this deficiency is very important because as Woo and Reeves (2008, p.180) argue

“one of the key components of good teaching and learning, online or otherwise, is interaction”.

Landry, Griffeth and Hartman (2006) in their article’s introduction portray LMS as the revolution that transforms students from passive learners to participative and communicative beings. They researched the perceptions of undergraduate and graduate students in business classes using Blackboard. The results from the Technology Acceptance Model (TAM), which measures users’ perception on usage, usefulness and ease of use, that they adopted, revealed that Course Content was perceived useful, whereas Support and Communication were used less and valued as less important. It should be noted that the study was performed on a specific curriculum (business) and the use of Blackboard, being not mandatory, could be avoided altogether. The authors’ conclusion that there was only limited usage of the system, which concentrated on Course Content, does not coincide with the primary advantage of LMS which is facilitating participation and communication.

Jamal and Shanaah (2011) 1 investigated the role of LMS in educational processes by interviewing instructors and students at the School of Computer Science at Linnaeus University in Sweden. The authors utilized the Community of Inquiry (COI) framework for their study. Following suit to previous researches, the findings revealed that the LMS used (Blackboard) was mainly utilized for organizing course material and not for interaction and communication, although students pointed out the need for including these aspects.

Vassilakis, Psaroudakis and Kalogiannakis (2008) performed a study on instructors’ and students’ perspectives using Open eClass. Their quantitative analysis was performed on the features: agenda (calendar), content (publish educational material), discussions (forum), links (relevant material in internet), announcements and course description. The results placed hierarchically from high to low usage were: content, announcements, course description, links, agenda and discussions. Additionally, the authors pointed out that at the TEI of Crete, Greece, where the study was performed, Open eClass was viewed as an educational content management platform and the students used it on a rare basis, although everyone recognized the advantages of LMS. However, what is important in this study for our purposes is that ‘discussions’, which is a communication’s aspect and denotes interaction, ranks last.

Along the same lines, Georgouli et al. (2006) examined students’ experiences while using Open eClass at TEI of Athens in the department of Informatics, which belongs to the School of Technological Applications. The study aimed to solicit students’ attitudes towards Open eClass. The outcome of the study illustrated that the students in the department of Informatics at TEI of Athens, like in the previously mentioned

1 The study reflects a one year master thesis and does not problematize how the interaction and communication were performed.
researches, found as most useful the uploaded educational material relating to their course, the announcements and the management of student projects. On the contrary, the communication tools received low rating.

1.3 Problem Statement

The above mentioned literature problematized us in respect to the use of Open eClass in TEI of Athens, where we both work. Through one researcher’s affiliation with the School of Management and Economics it was known that Open eClass was used just like all previous authors mentioned, mainly to facilitate instructors disseminating their course material to students. On the same token, students are facilitated by Open eClass in regards to accessing the material at their convenience with no time or place limitations. However, we were not aware about Open eClass usage in other Schools and deemed it necessary to investigate it.

A preliminary research that we performed, by interviewing the Open eClass administrator of the Institution, revealed that there was a range of usage in Open eClass. The statistical run, which he performed for us, displayed hierarchically the courses taught in the Institution based on the hits of Open eClass activity relevant to them. At that point, we asked him to produce a statistical report displaying hierarchically the use by department or school. This option, with the current version of Open eClass, did not work properly, but during the discussion we realized that such an approach would not be fruitful anyway, since within a department some courses might be taught with heavy Open eClass involvement, whereas others might have only elementary use. That being said, the statistical report of Open eClass use, by course taught, was sufficient for our purposes in distinguishing the fluctuation between high, moderate and elementary levels of involvement.

Motivated by this insight, we were able to trace and include in our research various levels of expertise, by concentrating on the users’ engagement and interaction aspects that are provided by Open eClass. Our participants’ input was used to draw guidelines as to how interaction and communication in Open eClass could be promoted in order to exploit it to its full potential. Although the aforementioned researches have touched the subject in-between the lines, none of them had this concern as their main objective. Therefore, this was an area that needed to be explored.

1.4 Purpose and Research Questions

Due to the various possibilities that LMS and specifically Open eClass can offer to both instructors and students in academic educational environment, we aim to investigate users’ perceptions on the usage of Open eClass in TEI of Athens, through an interpretive qualitative research, in order to obtain a richer understanding of its role in supporting and facilitating interaction and communication. Moreover, upon fulfilling the aforementioned aim and based on users’ desires, Soft Systems Methodology (SSM) is employed to formulate suggestions for the improvement of Open eClass usage. The improvement is directed towards enhancing users’ interaction and communication to generate meaningful educational experience.

Hence, in order to attain the aims and objectives of this study, there is a need to explore the following research questions:
-How do users -instructors and students- perceive the usage of Open eClass in supporting and facilitating their communication and interaction?

-How can communication and interaction through Open eClass, be improved based on users’ desires and needs?

1.5 Topic Justification

This study is worth pursuing since the significance of interaction in learning has become apparent through various researches. As it is advocated by Woo and Reeves, (2008) as well as Vrasidas and McIsaac (1999), meaningful interaction is a key component for good teaching. In the same lines, Inglis (1999, p.226) argues that LMS “offers the opportunity to increase both the quantity and quality of interaction substantially, and therefore offers the opportunity to improve the quality of the learning experience”.

Additionally, Dziuban, Moskal and Hartman (2005) argued that students’ satisfaction with blended learning depended on two major components, learning engagement and effective communication.

Therefore, both interaction and communication, through LMS, contribute to the quality of education (Concannon, Flynn and Campbell, 2005). The LMS "Open eClass" for TEI of Athens, is a critical factor that affects the learning process by adding quality in education. This quality affects the sustainability, viability and competitiveness of the institution and as such requires constant research for improvements. Since we both work for TEI over fifteen years, we personally care about its viability and we want to contribute in any possible way towards its effort to provide high quality services.

Additionally, the recent economic recession, that the country undergoes, has affected the performance of the students and the quality of education, as some students cannot attend classes either because they are forced to work or because some parents cannot afford to cover their children's expenses to reside in Athens (Koulouris, Moniarou-Parakonstantinou and Kyriaki-Manessi, 2014). This realization amplifies the need to explore ways to accommodate these students and the obvious available route is Open eClass.

Based on these insights, we conclude that it is important to conduct our research with a focus on interaction and communication through Open eClass in order to make suggestions for improvements.

1.6 Scope and Limitations

The scope of this study was to investigate the users’ perceptions of both instructors and students for the usage of Open eClass in supporting and facilitating their communication and interaction. Moreover, the aim was, based on users’ desires, to make suggestions for improvements in order to enhance the interaction and communication through Open eClass.

The research was conducted with the participation of both students and instructors who use Open eClass, in TEI of Athens and was guided by Checkland's Soft Systems Methodology (SSM). This research approach is appropriate, because it helps us
understand in a holistic way the complexity of the situation, which derives from the different worldviews of the individuals involved and allows us to formulate recommendations that can improve the interaction and communication through Open eClass.

The limitations of our study is its concentration on the Web-based rather than face-to-face education in the TEI of Athens’ blended learning environment. The relationships examined are those of instructors with students and among students, whereas the instructor to instructor communication and interaction through the platform has not been examined.

Furthermore, the last activity within the SSM cycle, taking action to improve the situation through implementing suggested changes, is out of the scope of this study. This study is performed for academic purposes and not assigned to us by the authorities of the University. Additionally, the meta-level activity of SSM, critical reflection on the whole cycle, is also out of the scope of this study, since it requires the completion of all defined activities and it is employed in assessing again the newly developed situation after the changes have been implemented. Therefore, we consider this study as an initial scouting of the situation, which, we believe, will entice Management to pursue changes for improvement based on our findings and suggestions. In order to achieve our goal, we concentrated on the perceptions of the actual everyday users of Open eClass, namely the instructors and the students, who were directly affected and involved. Therefore, the perceptions of the Management and other authorities of TEI of Athens, the Open eClass administrator and the developers of the platform were not investigated in our research.

Additionally, the methodology calls for an action-oriented research. As Baskerville and Myers (2004) state, action research, which is applied in two stages, the diagnostic stage and the therapeutical stage, is the research method where both the researcher and the subjects collaborate to create organizational change. In our study we, the researchers, worked closely with our participants through interviews and workshops in order to understand and diagnose the situation, depict it and emerge suggestions for improvement. However, it is out of scope in our study to implement the suggestions and, as such, the therapeutical stage of action research was not conducted.

Furthermore, it should be clarified that, although the intension of the study is to emerge suggestions for improvements which imply interventions, our purpose was neither to create awareness of underling social dominations, nor to provoke actions to eliminate them. The study examines the different worldviews within the context of the users’ subjective meanings of the situation in order to formulate recommendations for possible changes accommodating to all. Therefore, existing power relations or inequalities were not attempted to be resolved.

Lastly, all suggestions for improvement were based on users’ needs and desires without considering the technical requirements for their development, which is, also, out of the scope of this study. Additionally, it should be noted that the analysis performed based on SSM bears its own limitations as well. Although, SSM is a credible methodology with a number of experiential applications, it has been criticized for its subjectivity and relativist view, which implies that the results depend on the personal interpretations of the researchers and the participants.
1.7 Responsibility of the Work

In this study the decision to work collaboratively derived from the researchers’ common interest on the subject and also a common desire to implement Soft Systems Methodology. Additionally, being both employees of the institution we had a common goal; to improve the quality of education it offers. The institution recognizing the benefits of our interest facilitated the collection of empirical data for our research.

The instances where the work was divided were firstly while reviewing the appropriate literature for the theoretical framework which subsequently was discussed and decided which ones to include. Secondly, the work was divided again while the verbatim transcriptions of the recorded interviews took place. Each researcher transcribed half of them and then the documents were swapped, so we could check each other’s work and ensure their accuracy. Thirdly, each researcher worked independently on generating the initial codes and developing potential themes from the interviews’ data. The final themes were the outcome of the discussion and negotiation between the researchers.

The writing up process was performed together as otherwise the thesis would run the risk of displaying two different writing styles which was not acceptable for us. Additionally, it was decided against splitting up in conducting the interviews and the workshops to ensure transparency and make possible the reflection among us. This way we were able to refrain from any biases, since one was monitoring the other which was an added value to our conscious self-reflection. Therefore, each word in every sentence of each paragraph is the outcome of the intellectual contribution of both researchers.

Lastly, it should be noted that working together proved to be beneficial, as it provided immediacy which stimulated the motivation to proceed and finish our thesis, something that might be lacking in distance students who work alone.

1.8 Disposition of the Thesis

The rest of the thesis is organized within its five chapters as follows:

Chapter 2 - Theoretical Framework

This chapter presents the theoretical framework that the main topics of the thesis are based on. Specifically, technology enhanced learning, blended learning, learning theories, interaction, computer-mediated communication and computer-supported collaborative learning are thoroughly discussed.

Chapter 3 - Methodology

In this chapter the methodology is explicated. The chapter presents the philosophical tradition and the methodological approach adopted along with the Soft Systems Methodology that is applied. Additionally, it provides insight on the research setting, the data collection and the data analysis method. Finally, the trustworthiness of the study is established and the ethical considerations are exposed.
Chapter 4 - Empirical Findings and Soft Systems Methodology
In chapter four the empirical findings are presented and analyzed in the beginning followed by an analysis through activities one, two and three of Soft Systems Methodology.

Chapter 5 - Discussion
In chapter five the findings of the study are thoroughly discussed.

Chapter 6 - Conclusion
In this concluding chapter the answers to the research questions are summarized along with the emerged outcomes. Additionally, the contribution of the research is specified and the reflections of the researchers are presented. Finally, the suggestions for future research conclude the study.
2. Theoretical Framework

This chapter firstly introduces blended learning along with learning theories. Subsequently, it is presented a review of the literature related to learning enhanced by technology concentrating on interaction, computer mediated communication and computer supported collaborative learning. This literature is the base of this study and guides the research.

The initial aim of the research was to investigate users’ perceptions on how Open eClass supports and facilitates their communication and interaction. Since the environment under study is the blended learning one, it was necessary to examine the literature in this field. Additionally, since interaction and communication are investigated due to their determinant role in learning, it was imperative to examine them under the prism of learning theories, which provide the pedagogical foundation for an effective blended learning design. Furthermore, our concentration on how communication and interaction mediated through technology can improve the learning experience called for a review of the literature on Technology Enhanced Learning. However, Technology Enhanced Learning insinuates interaction, computer mediated communication and computer supported collaborative learning, which were also presented in the theoretical framework.

All in all, the above mentioned concepts were selected as technology does not “make” the learning, but it provides a new dimension on learning, once it embraces solid pedagogical methods founded on learning theories. In addition, these very concepts determined the framework of ideas that guided the Soft Systems Methodology application, which fulfilled the second aim of the research.

2.1 Blended Learning

Blended learning could be easily described as the integration of face-to-face learning with online learning (Garrison and Kanuka, 2004). However, the meaning of this definition may not be perceived the same way by all. For instance, the “online learning” term, which is literally translated as learning through a connection to internet, is perceived differently according to the cultural and societal background of an individual. In environments where distance education is widely exercised, online learning refers to the education provided to students through internet without the use of a physical classroom. In other cultures where education is administered primarily face-to-face, online learning is considered the adoption of technology in education to facilitate and enhance traditional teaching and learning. Under this prism, blended learning can be defined as the combination of face-to-face teaching with technology-mediated teaching (Bonk and Graham, 2006 as cited in So and Bonk, 2010).

The benefits of blended learning have been suitably expressed by Garrison and Kanuka (2004), who state that blended learning facilitates the variety and quality of interaction, fosters the sense of community and belonging and supports critical dialogue and critical thinking that lead to a dynamic and meaningful learning. However, these benefits can be achieved only when blended learning is utilized in accordance to learning theories.
Hadjerrouit (2008), adopted and tested Mayes and Fowler’s (1999) model that was used by Roberts (2003) to categorize Web uses, on blended learning. Based on the cognitive learning theory, the constructivist learning theory and the socially situated learning theory, Hadjerrouit (2008) distinguished three levels of blending. In the first level “blending at the conceptualization phase”, associated with cognitive learning theory, the student acquires knowledge when learning is blending face-to-face with available online course material. In the second level “blending at the construction phase”, associated with the constructivist learning theory, the students construct new knowledge with the aid of online task activities. Finally, in the third level “blending at the dialogue phase”, associated with the socially situated learning theory, face-to-face learning is supported by online interaction through communication and group collaboration. The findings of the study revealed that the online aspect added great value to the learning process. However, they also revealed that online resources alone do not provide any value. It is rather the design of online resources in accordance with pedagogical principles and good software usability that ensures great value.

2.2 Learning Theories

Hadjerrouit (2008) argues that it is very important to build on a solid learning theory that will provide the pedagogical foundation for the design of blended learning. According to the author, there are three prevalent models of learning theories: cognitive, constructivist and socially situated model of learning.

The cognitive learning theory focuses on knowledge as an organized structure, which is not independent from the learner, but is rather constructed by him by giving meaning through interpretation. The concepts and their relationships are in the center of the cognitive perspective of learning and are associated with mental activities, such as analytical reasoning and critical thinking. The learning process is built on the understanding of the connections between the concepts and new knowledge is integrated with the prior knowledge.

The constructivist learning theory, mainly based on Piaget’s cognitive development theory (1977), emphasizes knowledge as mental representations of the world that are actively constructed by the learners through the processes of assimilation and accommodation. Both these processes help the learner to construct new knowledge based on prior knowledge and experience and to adapt to the environment in a more complex manner. Constructivist perspective of learning views the learner at the center of the instructional process and as an active participant of the educational experience. Learners learn by themselves through exploration and problem-solving.

The socially situated learning theory, strongly built on Vygotsky's social development theory (1978), emphasizes the importance of social-cultural context within which learners act and interact in the construction of the knowledge. While learning is achieved through the social interaction with peers and instructors, social learning precedes development. Central to the Vygotskian theory is the notions of the “More Knowledgeable Other” (MKO) and the “Zone of Proximal Development” (ZPD). The MKO refers to anyone -teacher, other adult, peer or anything, even a computer- that possesses a better understanding upon a task, concept or process. The ZPD is the zone where learning occurs. This happen when the distance between what learners are able to do independently from others and what learners are able to do through interaction
with the instructor or more capable peers is eliminated. Learning is regarded as socially situated and knowledge is constructed through collaboration, discussion, negotiation, discourse and interactions with others.

Summarizing, the aforementioned perspectives, and especially the second and the third, encompass the fundamental principles of constructivism and its two basic strands: cognitive constructivism and social constructivism. The epistemological assumption of constructivism is that knowledge is not independent from and outside the learner’s mind, but is rather constructed in individuals’ minds through meaning making from our experiences and actions (Jonassen et al., 1995). There is no objective reality or entity but rather multiple interpretations of our world. Despite the fact that constructivism as a learning theory has many variants in educational settings, the common link among them is the notion that learning is defined as meaning making (Woo and Reeves, 2007). Additionally, Dabbagh (2005), examining the design of effective and meaningful E-learning, argues that pedagogical models, instructional strategies and learning technologies should interact with each other based on the situated cognition view, which is directly connected with constructivism. In E-learning settings, the distributed forms of interaction as categorized by Moore (1989), are namely learner-content, learner-instructor and learner-learner interactions and happen in synchronous or asynchronous knowledge networks, where learners and instructors come together to

“share information and resources, ask questions, solve problems, and achieve goals, and in doing so, collectively build new knowledge and evolve the practices of their community” (Dabbagh, 2005, p. 28).

2.3 Technology-Enhanced Learning

Technology-Enhanced Learning (TEL) is a broad term used to describe how the application of technologies that mediate communication and interaction improves the learning processes (Kirkwood and Price, 2014; Schneckenberg, 2009). TEL has been adopted widely in higher education due to its capability to provide access to vast amounts of course material, instant feedback and active engagement (Mulwa et al., 2010). Several studies have revealed that the incorporation of technology in traditional teaching, if applied correctly, provides opportunities for collaborative learning and enhances students’ cognitive, sociocultural and technological skills (Hilton and Hilton, 2013; Phelps, Graham and Watts, 2011; Manouselis et al.; 2011; Li, 2007; Latchman et al., 1999).

However, although the benefits from TEL have been recognized and technology has penetrated education, it is clear that technology’s abilities have not been fully exploited (Kinchin, 2012; Laurillard, 2008) and are used inconsistently (Selwyn, 2011). According to Laurillard (2008), technologies supplement education in a technology-driven way and are not utilized as a means of enabling pedagogical innovation. This approach, as argued by Selwyn (2011, p.715) results in

“recognize -and work within- the current and historical limitations of educational technology rather than its imagined limitless potential”.

Consequently, it is the enhancement aspect of incorporating technology into learning that is not an easy matter to achieve, as it depends on three core components; content
knowledge, technological knowledge and pedagogical knowledge. Additionally, the interaction among them is also considered (Koehler and Mishra, 2009). These components are depicted on their Technological Pedagogical Content Knowledge (TPACK) framework (figure 2.2). The authors, based on it, explain that “teacher knowledge is described in detail, as a complex interaction among three bodies of knowledge: Content, pedagogy, and technology. The interaction of these bodies of knowledge, both theoretically and in practice, produces the types of flexible knowledge needed to successfully integrate technology use into teaching” (Koehler and Mishra, 2009, p.60).

“two-way communication among two or more people within a learning context, with the purposes either task/instructional competition or social relationship building” (p.3). Moore (1989), based on a communication framework that constitutes of the message, the sender and the receiver, has proposed three types of interaction on distance education: (1) learner-content interaction (2) learner-instructor interaction and (3) learner-to-learner interaction.
1) Learner-content interaction

Learner-content interaction refers to the interaction that pertains between the learner and the subject matter that is provided for study. This type of interaction is essential for building knowledge, since it pertains to the cognitive process that occurs between the learner and the subject of study. According to Moore (1989) this type of interaction corresponds to Holmberg’s (1986) “internal didactic conversation”, where the learners’ interaction with the text resembles a conversation. Besides text-based forms of content, interaction can be achieved through audio, video and other computer-based educational facilities. Due to the fact that the effectiveness of computer based educational tutorials has often been questioned, Janicki and Liegle (2001) have introduced a framework consisted of ten concepts that positively influence learning as follows in table 2.1:

Table 2.1 Effective Web-design concepts, (adapted from Janicki and Liegle, 2001, p.62)

<table>
<thead>
<tr>
<th>Instructor as a facilitator</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety of presentation styles</td>
<td>Feedback</td>
</tr>
<tr>
<td>Multiple exercises</td>
<td>Clear Navigation</td>
</tr>
<tr>
<td>Hands-On problems</td>
<td>Help Screens</td>
</tr>
<tr>
<td>Learner controls the pace</td>
<td>Consistent Layout</td>
</tr>
</tbody>
</table>

2) Learner-instructor interaction

Learner-instructor interaction occurs on distance learning when the instructors, after providing the learners with a subject, aim to stimulate their interest, motivate them and help them organize the application of the gained knowledge. Also, they evaluate learners’ progress, supplying them with constructive feedback while supporting and encouraging them. This type of interaction is considered more significant both for instructors and learners when compared to learner-content interaction, as it is more influential on learners (Moore, 1989).

3) Learner-learner interaction

Learner-learner interaction refers to the interaction among students with or without the presence of their instructor. Through this type of interaction the students communicate with each other, exchange ideas, provide peer evaluation, collaborate and build online communities. This type of interaction is considered as an essential source for learning (Bull, Kimball, and Stansberry, 1998; Vrasidas and McIsaac, 1999; Wagner, 1997). Additionally, based on the social constructivist theory, many scholars (Picciano, 2002; Reio and Crim, 2006; Tu and McIsaac, 2002) have emphasized the significance of social interactions in learning by fostering the social presence and the sense of community that the learners feel.

Interaction in Web-based instruction

Liaw (1999), investigating the interaction in Web-based instruction, argues that interaction is a complex concept that is not limited just to accessing the educational
material or clicking on the computer screen. On the contrary, interaction should encompasses several and complicated activities,

“such as engaging, and reflecting, annotating, questioning, answering, pacing, elaborating, discussing, inquiring, problem-solving, linking, constructing, analyzing, evaluating and synthesizing” (p. 6).

Along the same lines, Woo and Reeves (2008) underline the importance of meaningful interaction that stimulates learners, leads them to higher-order thinking, fosters their reflective and critical thinking and contributes to authentic learning experience.

Therefore, returning to the three aforementioned types of interactions and based on Moore’s categorization, it is obvious that they intermingle in practice. Instructors facilitate and support students’ interaction with each other by providing as a basis a given content (Swan, 2002). Thus, although our research focuses on the instructor to learner and learner to learner interaction, as mediated through Open eClass, learner to content interaction cannot be totally ignored, since it is the means which enables the learning process.

2.5 Computer-Mediated Communication

According to Jonassen et al. (1995), computer-mediated communication (CMC) can be defined as

“the use of networks of computers to facilitate interaction between spatially separated learners” (p. 15).

In a web-based instruction the communication can be asynchronous or synchronous. Asynchronous communication is achieved through emails and discussion groups. This type of communication does not demand the simultaneous presence of instructor and learner in the educational activity. This means that the users can work at any time and from any place at their convenience. As Liaw (1999) states asynchronous communication provide users the time to reflect and think critically. As expected, asynchronous communication is mainly text-based.

On the other hand, synchronous communication, such as chat or teleconference, takes place in real time and requires the participants to be present at the same time but not necessarily at the same space. Synchronous communication facilitates the social interaction and collaboration of the group participants, while enhancing creative thinking (Liaw, 1999).

According to the constructivist approach, computer-mediated communication supports the construction of knowledge, as the participants can discuss, collaborate, negotiate, solve problems, explore issues and be engaged in reflective processes (Jonassen et al., 1995).

2.6 Computer-Supported Collaborative Learning

Computer-Supported Collaborative learning (CSCL) has emerged as a new and promising field in the learning sciences and researches and has evolved during the last twenty-five years since the term was first publicly used at a NATO-sponsored
workshop in 1989 in Maratea, Italy (Stahl, Koschmann and Suthers, 2006). According to Ludvigsen and Mørch (2010), CSCL emerged to fulfill the high demands of a knowledge-based society for specialized skills in collaboration and knowledge integration, especially since the use of web-based technologies had been widely spread and accepted in all the levels of education. CSCL is an interdisciplinary research field that focuses on how information and communication technology (ICT) can support collaborative learning (CL).

Collaborative learning (CL) refers to all the educational practices that enhance interaction among peers and promote learning. Collaborative learning lays on a learner-centered model that considers the learner as an active participant who builds knowledge from the interaction with others. Lipponen (2002) defines collaboration as a special form of interaction that includes the idea of knowledge co-construction and as a process of participation in collective activities. Both these definitions of collaboration encompass the notion of achieving shared goals. However, not all group learning activities can be considered as collaborative. As Dillenbourg (1999) argues there is a clear distinction between cooperation and collaboration; in cooperation the group members divide the task, work individually on the sub-tasks and finally put them together to form a complete outcome, whereas in collaboration they work “together” and collectively negotiate the final outcome or product of the collaboration.

Furthermore, the term “computer-supported” includes not only cases where remote students are connected through technologies, but also cases where technologies are used to facilitate face to face interactions (Dillenbourg, Järvelä and Fischer, 2009). Koschmann (2002, p. 18) defines CSCL as

“a field of study centrally concerned with meaning and practices of meaning-making in the context of joint activity, and the ways in which these practices are mediated through design artifacts”.

In other words, CSCL treats learning as a fundamentally group process where the construction of shared meanings through negotiation are achieved interactively in a social framework. Theoretically, CLCL is grounded in social constructivist learning theory. Dillenbourg et al. (1995) have identified three different theoretical positions that CL and consequently, CSCL was built on:

• the socio-cognitive approach which draws on Piagetian theory and focuses on the development of the individual in relation to the social interaction,

• the socio-cultural approach which is influenced by Vygotsky’s Zone of Proximal Development (ZPD) and focuses on the causal relationship that occurs between social interaction and the cognitive change of the individual.

• the shared situated cognition approach which builds on the situated cognition theory (Suchman, 1987; Lave, 1988) and places the focus on the social context where collaboration takes place as a process of constructing a shared cognition of a problem.

Each one of the aforementioned theoretical approaches has contributed to the evolution of CSCL where the social aspect plays a catalytic role in the facilitation of learning.
The potentials of CSCL in learning has inspired enthusiasm among the researchers about the benefits of collaboration and technology in education (Panitz, 1999), since several empirical studies have demonstrated the positive effects of CSCL on learning (Pea, 1993; Pea et al., 1999; Scardamalia and Bereiter, 1994; Kirschner and Erkens, 2013). Specifically, according to Kirschner and Erkens (2013), CSCL environments allow instructors to use pedagogical techniques, such as inquiry, critical thinking and critical negotiation that foster and stimulate deep and meaningful learning.

However, it has been argued that collaboration is not achieved by merely placing learners in groups and assign tasks to them (Brush, 1998; Hughes and Hewson, 1998), nor is learning through collaboration an expected outcome that just happens when group members come together (Dillenbourg, Järvelä and Fischer, 2009). Therefore, special attention should be given to the factors that constrain or facilitate CSCL implementation (Lipponen, 2002). These factors, according to the author are the “technical, organizational and pedagogical challenges” where “one could explore and find the advanced and innovative pedagogical practices (or needs) that already exist in the particular context that aims to take technology in use” (p.77).

2.7 Outline of Literature Relevance to the Study

Overall, the literature review presented various concepts which facilitate the development of an effective blended learning environment. In figure 2.3 the aspects that this study will concentrate on in order to examine communication and interaction within the LMS Open eClass are depicted in color. In detail, aspects such as interaction including computer-mediated communication (CMC) and computer-supported collaborative learning (CSCL) are investigated in this study under the prism of learning theories which provide a solid framework to implement effective learning through technology.
3. Methodology

This chapter firstly conveys the philosophical tradition that the thesis is based on along with the methodological approach which is adopted. Soft Systems Methodology is extensively presented, followed by the case’s research setting. Furthermore, data collection and analysis procedures are presented and discussed in detail. Finally, the trustworthiness of the study and the ethical considerations are explicated.

3.1 Philosophical Tradition

Within the information systems research, three philosophical traditions or paradigms, which rely on different epistemological and ontological assumptions, positivism, interpretivism and critical, have been employed (Orlikowski and Baroudi, 1991; Myers, 1997). These assumptions determine how to understand the phenomena studied, what questions to ask, how to answer them and how to interpret results.

Ontology refers to what constitutes reality. Under its prism, it is specified whether reality is assumed as objective, hence, there is a single reality; or subjective, where reality is depended on humans who create and recreate it (Orlikowski and Baroudi, 1991).

Epistemology refers to the assumptions about knowledge and how this knowledge can be acquired (Myers, 1997). According to Stanley and Wise (1990, p.26)

“epistemology is a theory of knowledge which addresses central questions such as: who can be a ‘knower’, what can be known, what constitutes and validates knowledge, and what the relationship is or should be between knowing and being (that is, between epistemology and ontology)”.

In reference to the aforementioned three paradigms and their ontological and epistemological assumptions, according to Orlikowski and Baroudi (1991)

- positivism assumes that there is a single, objective reality, which can be measured through modeling constructs. Additionally, knowledge is generated by deductively examining the causal relationships of the phenomena, which can be predicted and controlled.

- interpretivism recognizes that there is no single reality but subjective meanings of it. This implies that phenomena can only be interpreted through the individuals' subjective meanings, views and beliefs of their social reality. Therefore, knowledge can be obtained inductively by in depth examination of humans within their social world and by understanding their role in it.

- the critical paradigm assumes that there is a social reality, historically constituted, which is the ground for knowledge acquisition. In social world, contradictions are inherent and lead to inequalities and conflicts. The objective, within this paradigm, is “to create awareness and understanding of the various forms of social domination, so that people can act to eliminate them” (Orlikowski and Baroudi, 1991, p.19)
The philosophical position, which this research draws on, does not adopt the critical paradigm, since our objective is not to address the inequalities and asymmetry of power or provoke empowerment and emancipation per se, but rather to explore the different worldviews in order to formulate suggestions for improving the situation under study. Therefore, the research follows the interpretivist paradigm, which is appropriate for gaining a deeper understanding of the situation being studied, since it explores users’ perspectives in regards to Open eClass. We, as researchers, embrace the interpretivist paradigm, since it reflects our stance that reality is socially constructed and that we can access it through meanings that people assign to the phenomena. In order to do this, we focused on understanding our participants’ subjective interpretations of the phenomena within their context. In other words, we were interested in analyzing the complexity of our participants’ sensemaking, when they interact in a specific context through Open eClass. Their perceptions, views, experiences and beliefs were interpreted to build our knowledge on how Open eClass is used to support and facilitate interaction and communication. Subsequently, we took this a step further by employing the interpretivist tradition to emerge desirable and feasible ways to improve interaction and communication through Open eClass. Finally, it should also be noted that the interpretivist research is value-led, which means that the researcher’s pre-existing assumptions, beliefs and values shape their investigation (Orlikowski and Baroudi, 1991). As interpretivist researchers, we were aware of our prior assumptions, views and beliefs, when we performed the research.

3.2 Research Setting

TEI of Athens employs the LMS Open eClass, to supplement face-to-face undergraduate education. Open eClass is offered by the Greek Universities Network, GUnet, which is a non-profit civil company, whose members are all the Higher Education and Academic Institutions. It is funded by Greek Universities’ contributions and the Ministry of education (GUnet, n.d). Instructors can use Open eClass to make teaching material and assignments available to students, answer students’ questions (forum), collect students’ homework, provide feedback, post announcements and communicate with students (email) without needing to be physically present. Students on the other hand, through Open eClass, are able to retrieve teaching material whenever they need them, deposit their work, post questions that they may need for clarification and communicate with their instructors and fellow students.

All learning modules “active” and “inactive” are visible to the instructors, whereas the students can only see the “active” ones. The decision on which modules will be activated for students lays at the discretion of the instructor, who decides what activities the students enrolled in the course need to perform. A sample of Open eClass home page for instructors and students, as well as a brief description of each module is illustrated in Appendix E.

The learning modules that may be used for communication are: agenda, announcements, assignments, documents, forum, groups, message exchange, questionnaires, teleconference and wiki. Among these, the learning modules that facilitate interaction (two way communication) and collaboration are: forum, teleconference and wiki. This study concentrated on these communication, interaction
3.3 Methodological Approach

The most common classification of research methods is the distinction between quantitative and qualitative (Myers, 1997) which depends on the philosophical assumptions of the researcher. These philosophical assumptions, namely, positivism, interpretivism and critical, determine how the research will be conducted and evaluated (Myers and Avison, 2002).

Quantitative research is suitable when a large number of data is collected from various environments by a researcher who is distant and independent from the research process (Blaxter, Hughes and Tight, 1996; Coombes, 2001). This kind of research is more appropriate for the positivist paradigm, which seeks an objective knowledge that can be measured through statistical analysis and can be generalized. The methods and techniques used in quantitative research are surveys, experiments and numerical methods.

Qualitative research is suitable for “studying social and cultural phenomena” (Myers and Avison, 2002, p. 4) that are complex and non-measurable. This kind of research is conducted when an issue is to be explored in depth through meanings that participants ascribe to it, based on their perspectives and subjective views, within their natural setting (Creswell, 2007). Denzin and Lincoln (2005, p.3), in a targeted description, define qualitative research as,

“a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world…… At this level, qualitative research involves an interpretive, naturalistic approach to the world”.

The purpose of our study was to gain better insight and interpret users’ subjective perceptions and beliefs, while examined within their cultural and social context. For that reason we performed qualitative research as it best suited our research aims. Specifically, we applied Soft Systems Methodology (SSM), as it is a qualitative, interpretivist approach, appropriate for understanding different worldviews of the stakeholders involved and improving a messy and problematic situation (Checkland, 1989). Soft Systems Methodology is presented thoroughly in the next section along with an extended argumentation for the reasons behind its selection as our methodology.

Soft Systems Methodology

The primary principle of Soft Systems Thinking is the holistic rather than a reductionist approach when there is a need to handle a problem (Jackson, 2000). The reductionist approach refers to breaking up a problem in parts and working on them individually to derive a solution. In contrast, the holistic approach concentrates on understanding the relationship between the parts of a system and seeks resolution within the different perspectives of all relevant stakeholders. Jackson (2000) explains that this approach was necessitated by the fact that in social systems the human agents
who are involved have beliefs, perceptions and purposes which cannot be handled successfully under the reductionist prism.

Soft Systems Thinking assumes that there is a complex and fuzzy social reality, comprised by multiple approaches and perspectives (Mirijamdotter, 1998). Soft Systems holds an interpretivist approach, which means that, in order to improve the organizational problems, we have to take under consideration people’s subjective perceptions of reality and explore the different meaning they give to the reality depending on their different worldview. As Haftor (2012) explains, in Soft Systems Thinking it is assumed that relevant stakeholders will participate in an attempt to generate the knowledge needed to progress from what-is to normatively accepted suggestions of what-is-aimed-at. Regarding the nature of the modelling process, Soft Systems Thinking holds a holistic approach, where the system as a whole has properties that are not present in any of its parts. Therefore, in order to understand the system we must concentrate on the interrelationships and interconnectedness of the parts along with the environment in which the system exists and operates.

Peter Checkland developed a methodology, Soft Systems Methodology (SSM) that builds on Soft Systems Thinking. This methodology was developed during the 1970s from a program of action research at Lancaster University, where professor Checkland jointed professor’s Gwilym Jenkins team to tackle managerial problems, which could not be solved through Systems Engineering based on Hard Systems Thinking (Checkland, 1999; Bergvall-Kåreborn, 2002). The nature of these problems reflected their inability to be defined due to different worldviews of the involved stakeholders which render them ill-structured, fuzzy and “soft”. Checkland (1981) argued that Hard Systems approaches were inadequate to solve such problems. He developed the idea of better understanding the “social systems” of the real world through the concept of human activity systems. These human activity systems are purposeful, which means that they serve a purpose dependent on the meaning that the individuals ascribe to them, according to their background, previous knowledge, experience etc. Under this prism, a situation is interpreted as problematical depending on the subjective view of the individual which may not coincide with another’s person perceptions (Bergvall-Kåreborn, 2002). The purpose is to gain a deep understanding of the problematic situation through an iterative learning process in order to find possible changes, culturally feasible and systemically desirable, that would improve this messy situation. Overall, the success of the methodology is based on its approach on building knowledge, suggesting improvements and establishing changes that are agreeable among involved stakeholders (Somerville, Schader and Huston, 2005).

As it was mentioned before, SSM has been developed as an action research oriented process and according to Rose (1997) builds on the action research tradition. Checkland and Poulter (2006) argue that the idea of action research traces its origins to Kurt Lewin, who found that complex real world phenomena cannot be studied in a laboratory. Therefore, he suggested that such phenomena should be researched by taking active part in them. The objective of action research is to bring about changes in society and the researcher is actively involved alongside the participants in the change process (Checkland and Holwell, 1998).

Soft Systems Methodology is an interpretive approach and its philosophical base is phenomenology (Checkland, 1981; Mirijamdotter, 1998; Jackson, 2000; Holwell,
Phenomenology assumes that knowledge is based on human consciousness and views reality as a holistic construct of human mind, by making sense of it through meaningful experience. According to Mirijamdotter (1998), Soft Systems Methodology views social reality as meaningful based on individual preferences, knowledge, experiences, background and so on. Furthermore, the nature of SSM that relies on interpreting different stakeholders’ worldviews, *Weltanschauung*, places it under the hermeneutics umbrella. Lastly, SSM falls under the interpretivist tradition since it considers a subjective view of reality, it is a value-laden and context-dependent research and the researcher enters the problematic situation and works alongside the affected stakeholders.

Checkland and Poulter (2006) justify the term “Methodology” stating that, since human beings are unique, it is not possible to encounter the exact same situation twice. Therefore, any approach that aims to handle problems in social systems must be flexible, which is not the nature of a method or a technique. Furthermore, the authors highlight the basic points, depicted in figure 3.1, of SSM as follows:

- Real life is too complex to allow for permanent solutions, therefore, it should be understood that the aim is improving a problematic situation and not solving a problem.

- SSM is action oriented. In other words, it is geared towards actions that need to be performed in order to bring about improvement.

- SSM recognizes that not everyone perceives a problematic situation the same way, but rather there are different worldviews that need to be surfaced and examined.

- SSM considers the fact that the people involved make an effort to act purposefully and not instinctively.

- Based on the different worldviews and purposeful actions it is evident that inquiry through social learning can lead the way to improvement.

- Learning is an iterative group process that can be best described as a learning cycle, which will eventually expose the desirable and culturally feasible changes. This process is more effective when the affected are involved.

- The actions that will be performed to improve the problematic situation will bring changes which can trigger a new learning cycle.
In order to organize the process from identifying the problem to the actions that will improve the situation, Checkland suggests following sequential guidelines that he labels Stage 1 to Stage 7 (Checkland, 1981; Checkland 1989; Checkland and Poulter, 2006; Jackson, 2000). The seven stages are depicted in figure 3.2.

- **Stages 1 and 2 - Finding out**

The goal in these two stages is to define the problematic situation by including as many perceptions of it as possible that relate to the people who are part of this situation. The best way to represent the situation is through a rich picture. The rich pictures express the complex situation through the depiction of the relevant stakeholders, the structure, the processes and the climate.

- **Stage 3 - Formulating Root Definitions**

The Root Definitions are systems that state the purposeful activities which can be further explained through the “PQR” formula defining the “what”, “how” and “why” of this purposeful activity. Furthermore, the Root Definitions are constructed based on the CATWOE mnemonic, which corresponds to the elements Customer (the beneficiary of the system), Actors (the ones who will perform the activities), Transformation process (the actual purposeful activity specifying the input and output), Weltanschauung (the worldview that gives meaning to the definition), Owner
(the person who can stop the activity) and Environmental constraints (the constraints that are given in the environment).

- **Stage 4 - Building Conceptual Models**
The Conceptual Models depict what their corresponding system does and are related to their corresponding Root Definition. Specifically, through them the transformation process is described hierarchically and in detail. The model created should also include monitoring and control subsystems which will examine the operations and act to improve them so that, in a changing environment, the system can adapt and survive. In addition, the effectiveness, the efficiency and the efficacy of the system must also be considered. This way, it will be distinguished if the system is doing the right thing (efficacy) and fulfills its purpose (effectiveness) with minimum use of resources (efficiency).

- **Stage 5 - Comparing Conceptual Models with Reality**
The purpose of Conceptual Models is to facilitate understanding the reality and describe how the problematic situation can be improved. At this stage, the rich picture and the Conceptual Models are examined side-by-side, by the concerned parties. Through debate, the aforementioned parties define possible changes that can improve the problematic situation. This procedure can be carried out in one or more of four ways (Checkland, 1981; Checkland, 1989):

  1. Listing the differences between the features of the Conceptual Model and those of present reality to distinguish if the former are able to bring about changes.
  2. Opening up a debate about change using the Conceptual Model to define questions which are answered by the existing situation. This reveals what really happens and whether it is of concern or not.
  3. Generating a scenario based on what is described in the Root Definition. This can reveal what would have happened if the proposed change was implemented.
  4. Building a model of what exists in reality and comparing it to the proposed one. Once these two models are compared, their differences, which correspond to the proposed changes, can be evaluated and decisions whether to adopt them or not can be made.

- **Stage 6 - Defining “Feasible and Desirable” Changes**
The comparison of Conceptual Models to reality may expose a need for reassessment of the initial analysis or the reconfiguration of Root Definitions due to inadequacies. The objective, through this comparison, is to manage to form a coherent argument in favor of a proposed change that is systemically feasible and culturally desirable.

The emerged changes may be structural, procedural or in “attitudes”. The first two are easy to implement, but the third one is a complicated matter that will be achieved only when the concerned stakeholders come to agree that their attitude change may bring improvement. For instance, it is important to possess the needed resources and account for the real world dependencies, but no change stands a chance of being anchored, unless it is justified not only by logic but also in the mind of those affected.
Stage 7 - Implementing “Feasible and Desirable” Changes

Once the desirable changes have been identified and agreed upon, the implementation of them concludes the SSM cycle. It should be noted that, since SSM is not a methodology that provides solutions to problems but rather suggestions for improvement, the implementation of the changes will alter the original situation and may surface other inadequacies that will need to be handled in a subsequent SSM application.

Figure 3.2 SSM stages (adapted from Checkland, 1989, p. 84)

The above illustrated seven stages of SSM constitute the classical approach as presented in 1981 by Checkland. However, Jackson (2003), as cited in Yearworth and Edwards (2014), stated that

“Checkland no longer favors it—but it is still frequently used”.

In his retrospective section, Checkland (1999), in an attempt to capture the flexible uses of SSM that emerged through empirical work, suggested two later reformulations:

- The “two streams”. The analysis pays attention on two streams: one analysis that emphasizes on the Conceptual Models of the various stakeholders in order to emerge ideas for systems interventions and another that explores cultural and political streams that enable judgements on accommodating conflicting worldviews in order to reach a basis of agreement for taking action.

- The “four main activities” in an iterative process, as shown in figure 3.3.
  1. Finding out about a problem situation, including culturally/politically
  2. Formulating relevant purposeful activity models
3. Structuring a debate about the situation to define feasible and desirable changes
4. Taking action in the situation to improve it.

However, in a most recent revision (Checkland and Poulter, 2006, p.62) a fifth activity, critical reflection, was added to denote the “cycling round the primary four, namely critical reflection on the whole process”. This fifth activity, which is at a different level from the other four, ensures that “the lessons learned are captured”, as shown in figure 3.3.

![Figure 3.3 SSM five activities (adapted from Checkland and Poulter, 2006, p. 62)](image)

In our research we followed the latest version of SSM with the five activities, since it is the most contemporary and encompasses all seven stages of the first version. However, although SSM is an iterative process, we only applied the first three activities in a linear mode, since the fourth, taking action in the situation, and the fifth, critical reflection, were out of the scope of this study. Additionally, it should be noted that the SSM techniques were not used fully as it has been stipulated but rather as a vehicle to promote, encourage and develop ideas considering that raising awareness could develop some improving recommendations.

The rationale of choosing to apply SSM in our research is based first on fact that we have to tackle a messy and fuzzy situation, namely the interaction and communication usage of Open eClass in TEI of Athens. It is affected by the various and conflicting worldviews of the involved stakeholders, in particular instructors and students, and appeals to the essence of SSM. Also, the application of SSM is a learning cycle among involved stakeholders, which enables them to form suggestions for improvement by learning in their own way. Additionally, SSM does not require a predefined set of goals, which in our case was vital, since this study was not based on
managerial specific goals but rather on the researchers’ personal initiative. Furthermore, the flexibility that SSM provides allowed us to adopt and adapt its principles relevant to our problematic situation. Finally, SSM suits our social constructivist philosophical views due to its interpretive approach and its emphasis on understanding the subjective personal worldviews (Weltanschauung) of the stakeholders.

As was mentioned before, SSM is a well-established, credible methodology, even though it has stirred debates for theoretical criticism. It has been argued that the methodology in practice has been used in a conservative, legitimating and regulative way which inhibits radical changes (Mingers, 1980; Mingers and Taylor, 1992; Jackson, 2000). Additionally, Haftor (2012) highlights that there is neither a guarantee that all worldviews will be represented by the relevant stakeholders involved, nor that an accommodating solution will be established, as the stakeholders may not be able to comprehensively represent the current situation or determine what is desirable.

As Jackson (2000) stated, SSM does not consider the asymmetry of power in the real world, which is the obstacle that prevents open and participative debate on problem situations. In some cases, when genuine consensus cannot be reached or the worldviews are not bent, SSM is not effective. The subjectivism of SSM does not incorporate the external realities and the structure of social systems that shape the conflicting aims and intentions of individuals and exert constraints on them.

Checkland, in Jackson (2000), agreed that SSM application in practice has been used in a managerialist and conservative way. However, he pointed out that it is not the methodology per se that inhibits radical changes, but rather the way it is applied.

### 3.4 Data Collection

The preliminary research, that was performed, revealed different levels of Open eClass involvement per course taught and we could trace from a particular course its department and school to collect our data. The participants were selected based on their Open eClass integration level, so as to collect multiple views and experiences with the platform. We included high and moderate levels of involvement to gain a deeper understanding of views, concerns and suggestions. It was decided not to include low levels of expertise, since these individuals would not be able to contribute to our research purpose. In other words, it was deemed necessary for our research to solicit users who had an opinion on the subject matter.

We contacted in person fifteen instructors from each level (high - moderate) of involvement, starting from the top of the statistical report on Open eClass that we had acquired from the administrator. The intention was to purposefully select at least four instructors from each level to fulfill criteria of diversity on gender and level of academic position in order to have multiple views and capture concerns of all academic levels. Based on Patton (2002), our participants’ selection was purposive aiming not to generalize the sample to population, but rather to solicit rich information. However, we kept in mind that we would have to expand our original number of participants until no new information came up (Lincoln and Guba, 1985). During the course of the interviews it became apparent that our participants emerged similar perspectives, which kept coming up, and there was no need for further input.
Regarding the undergraduate students, we visited the classrooms where high and moderate level of involvement courses were performed and solicited participants, while keeping in mind to maintain the criteria of diversity in gender and level of study to ensure multiple perspectives and demands due to their unique experiences and needs. As with the instructors, we set the original number of four students from each of the two levels of involvements. However, within our limited time to conduct the interviews, we managed to receive only three responses from the experienced level and five from the moderate level, so we included everyone who volunteered. Nevertheless, although generally there was limited response to participate, our sample was adequate, since we collected rich information and after a point no new information came up.

Once we had selected our participants, eight instructors and eight students, we distributed to them our interview guide along with the consent form, so they could be informed about the details of the study and get a chance to prepare for the interview. Both interview guide and consent form was distributed in Greek, which is the native language of the country and translated to English for the purposes of the study.

The same participants were invited again, after the interviews had been completed and analyzed, to participate in two workshops in order to create SSM rich pictures of the situation and discuss the Conceptual Models that we had developed.

Another issue that had to be addressed was obtaining the consent of the management of TEI to perform the research within the institution. We forwarded a written request to the president of TEI and he gave us the permission to conduct the research (Appendix B).

Additionally, besides the interviews and the workshops we also studied the documentation of Open eClass and made test accounts in order to experiment with all its functions in order to familiarize ourselves with its capabilities. This gained knowledge was necessary to understand our participant’s input and facilitated the interpretation of their perceptions.

3.4.1 Interview Process

Upon the selection of the participants we made appointments, convenient to them, to conduct the interviews. Generally, all interviews were conducted in person and they were specifically performed from March 24th to April 3rd 2015. The instructors were interviewed at their offices, whereas the students were invited in our office. The interviews were conducted in Greek utilizing the interview guides (Appendix A1 and A2) and were all audio recorded as the participants had consented to that. The duration of the interviews varied from forty five minutes to an hour and a half for the instructors and forty five minutes to an hour and twenty minutes for the students.

In detail the interviewees’ characteristics and the interview specifics are listed in table 3.1. Within the table, the participants are represented by codes as follows:

- I: Instructor
- S: Student
- H: High level of involvement
- M: Moderate level of involvement
Additionally, the table depicts the position held (for instructors) and the level of study (for students); the date that the interview was conducted and the duration of each one.

Table 3.1 Interviewees characteristics and interview specifics

<table>
<thead>
<tr>
<th>Instructors with high level of involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructors</strong></td>
</tr>
<tr>
<td>IH1</td>
</tr>
<tr>
<td>IH2</td>
</tr>
<tr>
<td>IH3</td>
</tr>
<tr>
<td>IH4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructors with moderate level of involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructors</strong></td>
</tr>
<tr>
<td>IM1</td>
</tr>
<tr>
<td>IM2</td>
</tr>
<tr>
<td>IM3</td>
</tr>
<tr>
<td>IM4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students with high level involvement experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students</strong></td>
</tr>
<tr>
<td>SH1</td>
</tr>
<tr>
<td>SH2</td>
</tr>
<tr>
<td>SH3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students with moderate level involvement experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students</strong></td>
</tr>
<tr>
<td>SM1</td>
</tr>
<tr>
<td>SM2</td>
</tr>
<tr>
<td>SM3</td>
</tr>
<tr>
<td>SM4</td>
</tr>
<tr>
<td>SM5</td>
</tr>
</tbody>
</table>
The interview started with a presentation about the aim and objective of the research, as well as the methodology that was to be used. Additionally, we went over the consent form with the participants and urged them to carefully review all the terms. In order to ensure truthfulness, we stressed that the disclosed information was going to be kept confidential and we ensured them that we intended to maintain their privacy. Also, we made it clear that they could withdraw at any time with no explanation and they could refuse to answer anything that made them uncomfortable. The form was signed by both the participants and the researchers. A copy was left to the participants and another was filled for the research.

In order to create a relaxed atmosphere and establish rapport, we started the interview with warm-up general questions that related to their current status and asked them to provide us with a general sense concerning their involvement with the Open eClass platform. These questions made them open-up and got them talking. Thereafter, we exposed a printout of the available learning modules in the platform and asked the users to reflect on their use regarding the communication and interaction between instructors and students and among students. During their narration, in some cases, we were informed about ways of using these functionalities that we were not familiar with. This added to our knowledge. Also, we offered our knowledge about the platform to the participants on functions of the platform that they had not used and as such were not familiar with their functionality. This way our interviews were an iterative process that contributed to constructing mutual learning. In order to be able to live up to this we had experimented many hours with the platform creating test samples, which we displayed to the participants when asked.

During the interviews we had a chance to solicit the participants’ experiences and perceptions with the interaction and communication tools of the platform which surfaced many inadequacies in various domains. At that point, we had set up a fruitful ground to engage in a constructive discussion about concerns and desires through which many ideas and suggestions for improvements derived. It is worth mentioning that the conversation in all cases was so interesting that, although in many cases the participants had been adamant about keeping the interview at a maximum of forty-five minutes, which coincided with our intentions in order to avoid being importunate, they themselves ended up keeping the conversation going well over that.

### 3.4.2 Semi-Structured Interviews

According to Qu and Dumay (2011), the semi-structured interviews are conducted based on an interview guide which is produced in accordance with topics and issues the researchers want to know about, in an attempt to elicit elaborate and interesting responses. In other words, this type of interview enables the interviewees to expose their unique thoughts, which in turn enables the interviewer to understand and perceive the interviewees social world. Unlike the structured interviews, which presume that the objective truth will be revealed through right questions, semi-structured interviews are more flexible so as to pick up the unique traits of the interviewee (Qu and Dumay, 2011; Coombes, 2001). Also, the authors argue that semi-structure interviews, being flexible, are the means to exposing important hidden aspects of human behavior, which are expressed in the participants’ own terms and language. In our case, we are dealing with a diverse situation where different Open
eClass users, based on their experience with the platform, their technical skills and the pedagogical methods they have adopted, have formed different experiences, different concerns and different needs towards the improvement of communication and interaction. Therefore, it was evident that conducting semi-structured interviews was the best approach.

The interview guide for both instructors (Appendix A1) and students (Appendix A2) included opening questions and focused questions. The opening questions in both interview guides (questions 1-3) are meant to develop a friendly and comfortable atmosphere with questions that can be easily answered, being descriptive in nature and allow interviewee and interviewer to get to know each other (King, 1994). The focused questions which were formulated to answer the research questions correspond to the theoretical framework that was presented in detail in a previous section of the study. In detail these concepts were: interaction, computer-mediated communication, computer-supported collaborative learning and technology-enhanced learning under the prism of learning theories. The concepts of interaction and computer-mediated communication intermingle. As stated by Liaw (1999), interaction is defined as a two way communication and according to Jonassen et al. (1995), computer-mediated communication also facilitates interaction. Therefore, we incorporated both interaction and communication in the same questions, since our concern is to investigate the interaction accomplished through users’ communication via Open eClass channels. In detail, interaction as presented in the theoretical framework (Moore, 1989), entails learner-content, learner-instructor and learner-learner interactions.

3.4.3 Workshops Process

Once the interviews were performed along with their analysis, we called our participants to inform them about possible days and times for conducting the workshops. We were not able to accommodate all of them, but we finally picked a day and time that was convenient to most.

A total number of four workshops were conducted for the purposes of this research, as illustrated in table 3.2. The first two, A1 and A2, were performed in order to depict in rich pictures the problematic situation in regards with the usage of Open eClass for communication and interaction purposes. The participants depicted their likes and dislikes, their expectations, their desires and the barriers that inhibited the platform’s exploitation, in a coherent and connected way. Although our first intention was to construct the rich picture with the collaboration of instructors and students, in order to depict a holistic view of the situation, we decided against it when through the interview process we realized that there were underlying tensions that would cause uneasiness and restrain them from freely expressing their perceptions.

The next two workshops B1 and B2 were conducted so the instructors and the students could review the models that we had created along with the argumentation on their comparison to reality. The purpose of the workshops was to discuss the models we had formulated based on their ideas and concerns, which derived from the interviews and to decide which of them could be proposed as desirable and feasible changes.
Besides the code that identifies each workshop and the nature of the participants, table 3.2 encompasses information about the total number of participants in each workshop, the date that it was performed and its duration.

**Table 3.2 Workshops**

<table>
<thead>
<tr>
<th>Workshops</th>
<th>Participants</th>
<th>Num. of participants</th>
<th>Workshop date</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop A1</td>
<td>Instructors</td>
<td>4</td>
<td>4-21-2015</td>
<td>1h</td>
</tr>
<tr>
<td>Workshop A2</td>
<td>Students</td>
<td>6</td>
<td>4-22-2015</td>
<td>1h 30min</td>
</tr>
<tr>
<td>Workshop B1</td>
<td>Instructors</td>
<td>4</td>
<td>5-4-2015</td>
<td>1h 45min</td>
</tr>
<tr>
<td>Workshop B2</td>
<td>Students</td>
<td>4</td>
<td>5-4-2015</td>
<td>45min</td>
</tr>
</tbody>
</table>

**Workshops A - Expressing the Problematic Situation**

At the beginning of the workshops A1 and A2 the researchers presented the SSM activities and informed users how rich pictures are created as well as their purpose through literature samples. Subsequently, there was a briefing about our interview findings to refresh our users’ memory about the project. This generated a discussion among the participants which set the stage for creating the rich pictures.

In the workshop A1, which was performed with the instructors, only four could afford the time to participate in the process, even though we had invited all interviewees. We worked alongside of them, as facilitators, to depict their view of the situation and after several tries we commonly agreed on the picture that included all aspects in the most organized way. Although, there was some anxiety as time was passing, they enjoyed the process. All together, including our presentation of the methodology and the introduction on the rich picture technique, the workshop lasted for one hour.

In the workshop A2, which was performed with the students, we invited all the students who had been interviewed, but the arranged time was convenient for six of them. Similarly to instructors, the students depicted their view on the situation on a rich picture. This session was more demanding due to the number of participants and their feisty spirit. The duration of this workshop was one hour and a half.

Finally, the rich pictures that were constructed in the aforementioned workshops were recreated in an English version by the researchers.

**Workshops B - Validating the Models**

At the beginning of the workshops B1 and B2 the researchers refreshed the participants’ memory with a short presentation on SSM concentrating further on the reasoning behind the models and how their relation to reality emerge desirable and feasible changes that could improve the situation. Furthermore, we drew their attention towards thoroughly evaluating the changes to ensure that they would be the ones everyone could live with.
In the workshop B1 which was conducted with the instructors only the four who had attended the first workshop expressed an interest to participate, even though we invited all initial participants. Our presentation led to an intense discussion first about the Root Definitions and their corresponding Conceptual Models. After they had been thoroughly examined, one by one, various modifications were made. Specifically, two of the models were recreated from scratch to portray more accurately the instructors’ perceptions on the ideal situation that they envisioned, and in another one some activities on the Conceptual Model were reformulated. Furthermore, all performance criteria were revisited and reworded to capture more accurately their relevance to the models.

Thereafter, the discussion turned towards comparing the models to reality and considering the consequences of the proposed changes in the real situation. As the students were not present in this workshop we, the researchers, represented their ideas, concerns and desires in order for this workshops participants to decide on the proposed changes that all stakeholders could live with.

In the workshop B2 which was conducted with the students, all initial participants were invited, but only four wanted to participate. We presented to them, once again, the SSM just like we had done with the instructors. The students did not have any modifications to make on the Root Definitions and Conceptual Models as they had been reformulated by the instructors. It was not clear whether this was due to lack of experiences or if that they indeed, as they noted, agreed with them. Subsequently, the discussion turned to checking the models against reality and deciding on which to propose for changes. In this matter, the students agreed with the instructors’ propositions as they felt comfortable with the proposed changes.

It should be noted that the Root Definitions and the Conceptual Models that are presented in detail within the findings chapter, portray the final revisions as established from the workshops.

### 3.5 Data Analysis

The methodological approach used for this research was Soft Systems Methodology (SSM). As it was explicitly presented in section 3.2, SSM has its roots in phenomenology and holds an interpretivist approach.

The data analysis of the research consists of the analysis of the interviews and the application of the three activities of the SSM methodology as the last two, which relate to taking action and critical reflection on the four activities, are out of the scope of this study. In the first part, the collected data, which was gathered through interviews, are analyzed using thematic analysis. Specifically, through careful examination of the data, themes were identified, analyzed and reported in order to gain knowledge on the perceptions, experiences, shortcomings and desires of Open eClass users of TEI of Athens on interaction and communication enabled by the platform. Subsequently, the previously identified worldviews of instructors and students were depicted in rich pictures which in turn guided the development of Root Definitions and Conceptual Models. These were compared to reality in order to formulate feasible suggestions for improvement of the communication and interaction through Open eClass.
3.5.1 Analysis of Interview Data

The choice of performing interviews, which is widely practiced in qualitative research, is justified by the fact that through them people's subjective opinions and experiences are disclosed which is very important when their reality is under investigation (Peräkylä, 2005). The qualitative analysis of the data, collected through interviews, enables the researcher to penetrate the participant’s social world in “a subjective but scientific manner” (Zhang and Wildemuth, 2009). The process of performing this type of an analysis is tedious, complex, difficult and time consuming (Pope, Ziebland and Mays, 2000; Thorne, 2000; Basit, 2003) and it can be one of many methods such as grounded theory, interpretive phenomenological analysis, action research, ethnography, discourse analysis, narrative analysis, conversational analysis, content analysis and thematic analysis (Braun and Clarke, 2006; Vaismoradi, Turunen and Bondas, 2013).

From among the different methods to analyze qualitative data this research adopted the thematic analysis one. The choice was based on the qualities of thematic analysis to “organize and describe data in (rich) detail” (Braun and Clarke, 2006), while according to the authors is a flexible method, easy to learn and do and therefore suitable for novice researchers. It is widely used, seeing as it can answer the research questions by the insightful analysis it provides if applied rigorously.

The thematic analysis can be applied inductively and deductively. In the first case the themes derive from the data (data-driven), whereas in the latter the themes are set from previously established theories (theory-driven), (Boyatzis, 1998; Braun and Clarke, 2006; Elo and Kyngäs, 2008; Vaismoradi, Turunen and Bondas, 2013). In this study the inductive thematic analysis was chosen due to the nature of the research which does not intend to fit the data into a pre-existing coding frame, since it is not testing a theory. Also, the focus of this research is to identify issues, concerns, ideas and desires of the stakeholders on the research topic. For that reason, it is required moving from specific to general, which is undoubtedly a data-driven approach.

Overall, thematic analysis is the procedure where repeated patterns of meaning evolves through careful examination of the data. Braun and Clarke (2006), have developed a step-by-step guide where, within the six phases offered, they provide an outline to conduct thematic analysis in a deliberate and rigorous way. The authors claim that this type of analysis is a recursive process that involves constant movement across the phases. In our study, we followed these phases as follows (Braun and Clarke, 2006, p. 87-93):

**Phase 1 - Becoming familiar with the data**
In this phase the researchers transcribe the data and then read and re-read them to take notes about or mark initial ideas

**Phase 2 - Generation of the initial codes**
In this phase the researchers identify interesting segments across the raw data that are meaningful in understanding the phenomena. These segments are collated according to their relevance to form initial codes.

**Phase 3 - Evolvement of themes**
In this phase the analysis is taken to a broader level where overarching themes are established. The initial codes, which were generated in phase 2, are re-assessed during a collating process to fit within these potential themes.

Phase 4 - Review of potential themes

In this phase it is assessed if all generated codes, from phase 2, fit within the potential themes in a consistent and coherent pattern. Also, it is examined if the themes work for the entire dataset. According to Patton (2002, p.465), themes should have “internal homogeneity and external heterogeneity”. In other words, there should be meaningful coherence among the data within a theme and clear distinctions between themes.

Phase 5 - Establishment of themes

Once the review of potential themes is completed and it is identified what each theme is about and what aspects each captures, the final themes are established and the analysis of the data can be performed within them.

Phase 6 - Write-up of report

In the final phase of the thematic analysis, the researchers should produce a report that is concise, coherent, non-repetitive and interesting. The ultimate goal is to relate to the research question through argumentation and not mere description of the data.

The analysis of this study started by transcribing the interviews right after they were conducted which contributed to our becoming familiar with the phenomena. In order to preserve time, this process was split among the researchers. However, upon the completion of the transcriptions, each researcher checked the other’s work, while listening to the recording, to ensure that the actual meaning of the participants’ words was captured on paper.

The process of transcribing verbatim the recorded interviews was tedious and time consuming, but necessary to gain a better understanding of them. Additionally, it was also necessary to determine, after the first interviews (instructor - student), any adjustments that needed to be done for subsequent ones, in order to capture latent and semantic issues. This fact was achieved by reading and rereading the transcripts and through discussions and negotiations among the researchers. Meanwhile, each transcript was translated from the native Greek language to English. This task was performed by both researchers working together to ensure the validity of the translation as the use of vernacular Greek language in interviews is a challenge in itself to be translated.

In relation to the second phase, after reading and rereading the transcripts, we created post-it notes with the identified pertinent segments of each translated transcription. This process was done individually by each researcher and once done the post-it notes were compared and discussed. The outcome was the grouping of segments into commonly accepted initial codes.

In the third phase, each researcher worked individually into developing potential themes by collating initial codes according to their relevance. The process emerged issues such as the need to rethink the initial established codes and the relationship
among them as well as between them and the themes. The researchers discussed, negotiated and decided upon the final codes and their relation to potential themes.

The potential themes were further reviewed by each researcher to fulfil the fourth phase. During this process each researcher justified the relevance of the themes with the codes and among them. In cases where there was a divergence in opinion, we discussed and concluded on commonly accepted themes.

Once a satisfactory set of themes were established, we proceeded on analysing the data within the refined themes and produced the report as explicated in chapter 4. Moreover, the findings from the interviews were drawn into the application of the SSM methodology, to establish the grounds of developing the rich picture and to describe the problematic situation as well as the suggestions for improvement, associated with the interaction and communication through Open eClass.

3.5.2 Analysis of the Workshops

The workshops were conducted to construct rich pictures and discuss the developed models. The analysis of them took place within the SSM application activities one (finding out about the situation) and three (comparison with reality to find desirable and feasible changes) respectively.

3.6 Trustworthiness of the Study

The trustworthiness of qualitative research has been debated by positivist researchers, since there are not clear cut lines to measure the validity and reliability as in quantitative research. In regards to this issue, Shenton (2004) has suggested several strategies, based on Lincoln and Guba’s (1985) criteria: credibility, transferability, dependability and confirmability that ensure trustworthiness in qualitative research. Following Shenton’s (2004) approach, we applied several provisions in each strategy on our case to ensure trustworthiness.

Credibility

Credibility refers to the accuracy of the recording of the phenomena that has been examined. Among Shenton’s (2004, p.64-69) strategies to ensure credibility in our study apply the following:

- the development of an early familiarity with the culture of participating organizations before the first data collection dialogues take place

In this study both researchers work for the organization and are familiar with its culture and the processes, which ensures deep understanding of the organization and engagement with the stakeholders. However, special care was given to remain unbiased and detached from personal prejudice. This was achieved through checking up on each other and by constant self-reflection.

- triangulation

In this study several collection methods were employed. These methods included studying the documentation on the platform, experimentation with its functions, semi-structured interviews with instructors and students to obtain different worldviews and
a deeper understanding of the situation under scrutiny and workshops with the involved relevant stakeholders.

- **tactics to help ensure honesty in informants when contributing data**
  
  All participants were solicited on a voluntary basis, were assured about their privacy and confidentiality, informed that they could withdraw at any time without an explanation and encouraged to express themselves freely and without fear. Additionally, we established a relaxed and comfortable atmosphere and emphasized that all opinions and ideas were valuable and important.

- **iterative questioning**
  
  In order to ensure all interaction and communication functions were discussed, we displayed to the participants a printout of the functions of the platform. This way, we facilitated the evoking of each function which helped participants recall how they used it. Additionally, this practice helped us to stay in track during the discussion.

- **peer scrutiny of the research project**
  
  In this study the asset of two researchers working on the project ensured the challenging of assumptions which is the pitfall that an investigator falls in due to the inability to be detached while working so close to the research. In many stages throughout the project there were constant discussions and negotiations as explained in detail in relevant sections.

- **member checks**
  
  The nature of this study was fruitful for member checks as the original interview process was followed by two workshops were the participants had a chance to review and discuss all findings. This procedure is embedded in SSM application, since in this methodology the researcher is rather a facilitator and not a decision maker.

- **thick description of the phenomenon under scrutiny**
  
  Special care has been given to describe in detail the situation under scrutiny and the surrounding context.

- **examination of previous research findings**
  
  All findings were counter examined with previous research both in the same and similar organizations.

**Transferability**

All parts of the study such as the research setting, the method followed in data collection, information about the participants, information about the interviews (number, time period, and length), the application of SSM and the data analysis process were described in detail. This thick description of the studied phenomenon ensures a deep understanding of the case and facilitates other researchers in determining its ability to be transferable in another setting or context.

**Dependability**

According to Shenton (2004), each research should provide detailed insight of the process followed, so that a future researcher may repeat the work. In order to ensure this, the author (Shenton, 2004, p. 71-72) suggests including the study sections that are devoted to:

- **the research design and its implementation**
• the operational detail of data gathering
• reflective appraisal of the project

In our study all aforementioned sections are presented in detail.

**Confirmability**

In order to ensure confirmability during data analysis the researchers worked individually and compared notes that led to discussions and occasional re-examination of meanings to ensure that the displayed findings reflected the participants’ experiences and ideas and not the researchers’ preferences. Additionally, triangulation, as explained in the Credibility section, was exercised to reduce the researchers’ biases.

### 3.7 Ethical Considerations

Our ethical considerations on implementing the research derived from Hart’s (2005) recommendations. According to Hart (2005, pp. 298 - 299), while conducting a research the main issues that need to be considered include,

> “having respect for others, avoiding mistakes and being self-reflective”.

In detail, the author, while describing the respect for others, raises the need to obtain a consent form for disclosing the participants’ input, avoid exposing them to stressful situations and safeguard their safety. In regards to avoiding mistakes and being self-reflective, Hart (2005) advises taking measures to ensure data accuracy, avoid methodological “myopia” by reflecting on what the role of researcher requires, ensure staying within these boundaries and omit presenting personal assumptions and beliefs as belonging to the collected data.

In our case, the privacy and confidentiality of the participants was ensured, their participation was voluntary and they were assured that they could withdraw at any time. Also, we obtained permission from the authorities of TEI to perform this research and informed consents from all the participants, where the purpose of this study and the procedures were extensively explained. Besides that, we assured the users that the collected data would remain secured and used only for the purpose of this study, their identities would be safeguarded and our analysis and findings would be at their disposal upon their request.

Additionally, due to both researchers work in TEI of Athens, we were very careful in regards of exhibiting professional attitude and protecting the participants from any harm. Our dual role as researchers and employees of the institution was an advantage, although, in a sense, it was a burden as well. Being in the organization for over fifteen years, we are familiar with the personnel, their issues and the organizational setting in general. As members of the organization, we were positively perceived by our participants who felt comfortable to express their views, concerns and desires. For our part, we were very careful not to manipulate them by withholding our personal assumptions and preconceptions. We encouraged them to elaborate without interrupting or putting words in their mouth. Since it was two of us working together, we reflected on each other’s interpretations while being self-reflective, throughout the whole process. On the other hand, we felt the pressure that arose from our responsibility to keep a balance in tackling sensitive issues, underlined by the focus of the research on conflicting views and tensions.
In regards to ethical considerations while reporting our research we followed, once again, Hart’s (2005) recommendations. Hart (2005, pp. 299-300), in this phase, recommends to apply,

“full and proper attribution of ideas, ensuring the integrity of the data, safeguarding confidential informations and maintaining standards of authorship”

Specifically, while reporting a research, the author cautions about presenting people’s words or ideas as being the researchers’, fabricating the data or omitting parts of it, revealing or selling the collected data to a third party and failing to accredit all the people who were involved in the research.

In our case, whenever the actual words of the participants were stated, quotations were used along with the code that discreetly identified each participant. Additionally, special care was given to the translation from the Greek language that was used with the participants, to English. We explained this obstacle to the participants and kindly asked them for their written permission to record the sessions. The recordings enabled us to transcribe the sessions sentence by sentence to ensure accuracy. Subsequently, the transcriptions were carefully translated to English after a careful consideration of the words used in order to preserve the interviewees’ actual meaning. Finally, our collected data was not made available to anyone besides the researchers, who are the only ones involved in this research.

Similarly, special care was given to the reconstruction of the rich pictures, as an exact replica of the originals but with English labels. This process was a lot easier, since it contained just words or small phrases.
4. Empirical Findings and Soft Systems Methodology Application

This chapter firstly presents the findings from the interviews which are analyzed through thematic analysis. Secondly, Soft System Methodology’s first three activities are applied on the case. Within the first SSM activity the problematic situation is explored through analysis one, two and three along with a depiction of the situation in rich pictures. In the second activity, which is geared towards formulating relevant purposeful activity models, five Root Definitions and corresponding Conceptual Models are presented. In the last activity, after comparing the Conceptual Models with reality, the proposed feasible and desirable changes are discussed, along with the rejected ones.

4.1 Interviews Empirical Findings

The collected data, following Braun and Clarke’s (2006) recommendations, were thoroughly examined and re-examined to identify reoccurring patterns of meaning. This process enabled the derivation of themes, within which data analysis was then performed. All in all, we identified five themes:

1. The platform as a means for disseminating course material
2. The platform as a means for information exchange
3. The platform as a means of interaction and collaboration
4. Organizational and cultural barriers to exploitation
5. Ideas for improvement

Each theme is presented in detail and contains the perceptions of both instructors and students.

1. The platform as a means for disseminating course material

The benefits of the platform, as a tool for disseminating course related material, was appreciated by all participants. The instructors pointed out that it was a great way to organize their material and distribute it to students with less time overhead and no cost. The instructors also felt at ease that all students had access to the same information which was undisputable, since all actions were done through the platform.

Instructor IH4 stated that the platform is a point of reference common to students and instructors which makes it easy to locate and retrieve any material relevant to a course. In her own words the instructor said,

“*The platform is my helping hand, I am confident that everyone will see the things I post and arguments of the nature I didn’t know has been eliminated plus I don’t have to give out my material to be printed and then distribute them to students since I can post them in a minute from anywhere and at any time*”.

However, the instructor also mentioned that
“I have to notify the students, usually through email, that I have posted material for them in the platform as it is not a regular practice for them to be in the platform all the time like they do with Facebook”.

IM2 stated that

“The platform is a necessity for me because it has helped me organize myself. In some occasions while looking for something it was easier to locate it in the platform rather than going through my files. Besides, I stopped making copies which was a headache, because I had to make sure that all students had received them and I had to carry them in class every time, so someone who was absent at a previous time would finally get them. The platform has definitely reduced my workload in that aspect and the responsibility of getting class notes has transferred to the student”.

Additionally, the instructors felt confident that, this way, transparency was ensured. Instructor IH2 highlighted the climate change after the use of this function of the platform as he felt that

“The students appreciate having everything available as they feel like they were playing a game with clear rules”.

Along the same lines IH3 pointed out that

“Posting of course material, in my opinion has improved the cooperation between the students and me. All who are interested come prepared and I have experienced increased student participation in the course compare to the past when we did not use the platform”.

Similarly, the students appreciated the convenience of accessing their course material regardless of place and time and valued the ability to retrieve their instructor’s notes, since this practice left no room for ambiguities, as might have been the case when taking notes themselves.

Student SM2 was very satisfied that

“Every time after a lecture the instructor’s notes are posted in the platform so I can watch the lecture and concentrate on what is said rather than copying in my notebook what is shown”.

SH1 argued that

“It is not just posting course material that matters, but rather how the material is organized to lead you from one thing to the next without gaps or ambiguities”.

She continued saying

“In the courses that course material is well organized I find it easier to study and I do better in final exams”.

SM1 felt that there is a need for the course material to be in the platform, because he works and sometimes he can’t make it to the lectures. As he described it

“I would be lost without Open eClass, since because of my rotating working hours a lot of times I can’t make to the lectures, so it is great to find the material that was covered in class on the platform. This way I can get at least an idea of what was done and ask my peers specific questions on points that I need to have clarified”.
Along the same lines, student SM5 talked to us about a friend of hers that due to economic hardship was accessing the course material from her home in a village. As SM5 described

“At the end of the semester she came to Athens to take the exam and successfully passed the course”.

Therefore, it became clear that first and foremost the platform is praised for the breakthrough on the organization, distribution and access of course material. At this point, neither instructors nor students could live without it, for they view it as a supplementary and supportive tool that enhances the educational process. They praised the fact that it is an easy, fast and transparent way to store and disseminate course material.

2. The platform as a means of information exchange

The platform offers several learning modules, as described in section 3.3 “research setting” that can facilitate substantial communication. However, it was found that the modules primarily used facilitated the communication from instructors to students. For instance, while examining the issue of communication in more detail, it was observed that one way communication such as announcements about class cancellations, class rescheduling, departmental happenings, posting of new material, examination dates, etc., were appreciated by both instructors and students. Instructor IH3 nicely explained this type of communication as

“Announcements is a great way to inform students about everything that pertains to them. I am sure that they will get the message although I know that many of them don’t get in Open eClass all that often. You see, when you send an announcement, there is an option to send an automatic email to all course participants as well, which I always do. Therefore, even those who do not get in the platform are informed by their email, plus there is always an active student that will repost my announcement to some Facebook that they are always in”.

Another instructor, IH2, pointed out further one way communication benefits provided by Open eClass

“Open eClass is an exceptional communication tool. I can pass along announcements to my students from anywhere without bothering the administrative secretary, as we used to do in the past and I can answer questions or provide solutions even when I am outside the country”.

The students’ comments on this one way communication is described by SM3 as

“It is great to know in advance that a lecture has been cancelled or be reminded about a test coming up. Once, I paid a taxi, during a general strike, to get to TEI in order to make to class on time and I found out that the classes had been cancelled as well. However, I had only myself to blame for not checking Open eClass announcements. The cancellation had been posted there”.

Student SM4 finds this communication useful as well although she mentioned

“It is good that the instructors post announcements in Open eClass, although I rarely get on because I am notified about them through my TEI group on Facebook mobile app.”
Although students valued the instructors’ communication towards them, they pointed out that the level of communication differed from class to class and it was instructor specific.

Student SH2, while asked how he perceived the communication through Open eClass, mentioned

“I can’t say for sure, because it depends on the instructor. Usually, when the instructor has better technical expertise, the platform is used more effectively regarding communication whereas at the other extreme it is only used as a repository of course material”.

Similarly, student SH3 explained to us that

“It depends on how the instructor organizes the course around the platform, but it also depends on how much the students want to be engaged as well. For instance, in a course I took the initiative to start a forum and the rest of the students participated actively”.

Another student, SM4, who did not have a lot of experience yet, being a freshman, mentioned that

“The communication level is set by the instructors and we comply with their demands. However, I have noticed that I am more involved in the courses where the instructors use the communication channels of the platform, because in a way this motivates me to get in and make sure I am not missing anything, how can I say it, it doesn’t let me forget about it and put it off for later”.

Regarding students, in most cases they communicate with their instructor through email or in person. The reason behind this is that most of the time the instructors make available to the students their email and only a few of them direct students to Open eClass for communication purposes. The latter is practiced by instructors who believed that it saved them time to communicate with the students through the platform for answering questions. Specifically, IH1 mentioned

“I urge my students to communicate with me through Open eClass and not with personal emails, because it is likely that one’s question would pertain to others as well. So, when I answer a question that can be viewed by all, it saves me time from repeating the same answer to others”.

This approach is not favored by others who believe that TEI provides face-to-face education and they feel that students ought to come to class or during instructor’s office hours for any type of communication. Instructor IM4 mentioned that

“I am available to the students during the lecture to clarify things and answer questions, so it frustrates me when I get questions on things that I have taught, by students who had not attended the class. I think that some students misinterpret the use of Open eClass as being the means to attend classes from distance. This is not what we are here for”.

Similarly, IM2 mentioned that he does not consider Open eClass as a communication tool because this is what the classroom is for. He justifies this saying

“I use Open eClass to communicate things to my students, but the other way around takes place in class or during my office hours. Anything beyond that I consider excessive”.
We insisted a little on this point, bringing up the recent economic hardship of the country. Specifically, we mentioned the inability of some students who come from other parts of the country to pay for their living expenses in Athens which deprives them from attending classes. Additionally, we mentioned cases where students cannot attend class because they have to work. This aspect puzzled the instructors who agreed if that was the case then the whole educational setting in TEI should change format. In those instances they agreed that enhanced communication through Open eClass would not only be beneficial but pertinent as well.

The communication among students rarely takes place through Open eClass. It seems that the students prefer to call, send email, call on skype or connect through Facebook with their peers. One reason is that the platform does not provide enticing and functional communication. Even the live chat does not show if anyone is online and the students do not want to waste their time sending a message that probably nobody will see. In only one occasion student SM5 mentioned

“Once, I needed to communicate with someone from my group in a class about an assignment. I did not know anyone in my group and the only way to get in touch with them was by accessing their email through the platform. Other than that I usually call or message or skype my peers on days that I don’t see them on campus. I would use the platform, if it had skype like abilities”.

However, when it came to communication through the platform for learning purposes, such as giving feedback, which only a few instructors practiced, the students pointed out that it would be very helpful and would enhance their work and contribute to learning. The standard practice is just to grade the assignments and discuss common problems or good approaches in class.

Student SM5 had experienced feedback in one course and she liked it very much

“It was much better than other courses where we get feedback in person after a while when it is too late to learn from it or just a grade. I know that the instructors have a lot of assignments to correct, but without the feedback to see how you performed, you can’t learn from it”.

Student SH1 had a different experience

“In the beginning when I was not familiar with the platform I accidentally came across a feedback that was attached to my assignment. Unfortunately, it was too late to work on it based on the instructor’s suggestions. I wish this platform somehow could notify us for all new postings. It’s a hassle to look through everything all the time for something which is not expected, nevertheless. However, I did appreciate the instructor’s effort and the opportunity I had been given”.

On the other hand, some instructors mentioned that when they provided feedback to students and gave them the opportunity to improve and resubmit their assignment, many students ignored them. Others claimed unable to manage posting feedback due to the excess number of students. Finally, some instructors provide feedback to students through email, if they consider it necessary to guide them to improve their work.

Instructor IH2 mentioned that he spends a lot of time on feedback, because he thinks that the optimum goal is for students to learn and remain engaged and not just to receive a grade. In his own words
“I put a lot of effort on providing feedback. Some students take advantage of it and redo the parts that need work. Unfortunately, others are just interested in passing the course and, if they have achieved that, they don’t bother anymore”.

Instructor IH1 stated that she gives feedback on assignments with unique problems, when she encounters group problems, she prefers to inform students through the forum. As she mentioned

“I am trying to make time to provide students with feedback, because I want them to know that someone cares for their work. This is important to keep them engaged. However, only a few students improve their work. My experience is that students, once they submit their work, consider it done”.

Another instructor, IM3, follows a slightly different approach. As she explained

“First of all I should make clear that my assignments are brief and I can afford the time to provide feedback on them. However, I only do it with assignments where students need some guidance to improve their work and not with the excellent or the failing ones”.

Overall, it became evident that the communication through the platform is limited and used to facilitate the instructors’ communication with students and not the other way around. However, the students expressed the desire to communicate through the platform, as long as it could provide equal or better capabilities compared to communication channels, like skype or Facebook. The common practice so far shows that the usage of the platform has been kept, by the majority, to the absolute minimum and necessary functionalities such as distribution of course material, collection of students’ work and dissemination of information relevant to course happenings. However, it also came up that as the economy of the country worsens the dynamic of the institution is bound to change as well. Common practices will have to be reconsidered to accommodate students’ needs and desires while considering the instructors’ needs and constraints as well.

3. The platform as a means of interaction and collaboration

Interaction and collaboration through the platform can be exercised through forum, wiki and teleconference. Right from the start of the interviews it became clear that no one uses wiki and teleconference, so this theme is exclusively around discussion topics and how they are used to contribute in learning. Furthermore, even the discussion topics are rarely used and some students do not even know that they exist. However, the students who have experienced the process pointed out its benefits and would like it to be a regular practice.

Among the students who have used discussion topics in at least one course, student SH1 describes it as a positive experience

“We used forum in one course. Actually, it had three discussion topics, one for each assignment that we had. It did help a lot. All questions, ideas and even a software that we needed to use was posted there by someone who found a site and provided the link. It was easy to refer to for clarifications, because the instructor had posted additional information there. It made me feel good to have a place to share my concerns and it brought me closer to students that I didn’t know until then. I did well in that course…….. It wasn’t group assignments, it was individual
ones, but I think that there was more cooperation there than other group assignments I have done where everyone did their part on their own”.

Another student, SH3, had taken the initiative to request the activation of the forum and created a discussion topic. Her experience was,

“In a course I took the initiative to start a forum and the rest of the students participated actively. It was a great way to exchange ideas and clarify questions on our assignment and generally we helped each other, but I should say that the instructor did not participate although there was reference made to his name”.

The students who did not have any experience with forums were intrigued by our description of its capabilities and claimed that they would like to have the function available in their courses. However, some concerns came up as well.

Student SM2 was skeptical as,

“It sounds good and helpful, but I don’t know if I would like to expose myself to my peers. I would definitely watch what others have to say. It is an issue that the instructor can see what I am saying, what if I say something stupid….. Also, I am not sure that I would trust other students’ advice…. I think I would rather mail my questions to the instructor directly”.

Student SM1 didn’t seem to care about the forum all that much, because he did not miss this type of interaction being a member of a closed group on Facebook.

“Yeah, sure… it is a good thing. I don’t think anyone in my class would need it though. We have a group on Facebook and we discuss all the things we need there. I think it’s easier to use Facebook and the instructor is not watching but... it is a point that then we can’t have the instructor’s input and we may be totally wrong on something”.

On the other hand, some instructors had not used it and they were not even aware that they had to at least activate it to be visible to the students. They did not seem to mind making it available as long as they wouldn’t have to monitor it. However, other instructors valued this option a lot and made it a point to create forums at least for all the assignment they gave out. They believe that the forums can initiate collaboration, build a sense of community and help the weak students to cope with the demands of the assignments. Finally, some had made it available, but did not encourage the students to participate and the forums were not used productively.

For instance, instructor IH4 mentions

“I open up forums for all my assignments and I actively participate in them myself. It takes me time to do this, but it is worth it and it is the only way to get the students to participate. Besides, I have followed different teaching practices and I can tell that creating a sense of community contributes to the learning process”.

Instructor IH1 was a little disappointed with the forums, because as she said

“I create discussion topics for every assignment and I encourage the students to participate. However, I don’t see great participation or in depth discussions that lead to learning. I don’t think they have the sense of belonging in a team and that their peers may help them or that they can help someone else. Of course, we have to consider the quiet ones who are timid and may be watching silently, but I have a suspicion that they resort to other places to communicate such as Facebook”.

IM1 did not know that she needed to activate it but she was going to do it in the future
“Really? The students can’t do that on their own? They should be able to. I will activate it in my courses.”

Instructor IM2 was not aware of what forum did and from our description he was appalled because

“I don’t use it, why should I? I have not cultivated it... I don’t understand it....it reminds me of Facebook... chat room... I don’t have Facebook myself... they have told me that it might become helpful, but I have not tried it”.

In collaborative or group assignments student’s interaction mainly took place outside the platform and rather rarely, since the regular practice is individual assignments. This way it is easier for the instructor to assess each student’s knowledge.

Instructor IM1 explained the reason behind assigning individual tasks as

“The structure of my course does not allow for collaborative work, because I have to assess each one’s individual knowledge. With group work this cannot be done”.

Furthermore, none of the students or the instructors had exploited the possibilities of the wiki option. All the instructors that were interviewed had not activated it for the students and either they were not aware of how it worked or how they could structure the course so it could be used. Because of this, the students were not aware of its existence or what it was about.

Instructor’s IM3 opinion was

“I have checked out wiki, but I don’t think it is very functional.... it does not allow simultaneous writing, just one person at a time can make changes, besides..... I do not assign collaborative work. Once when I tried it, the students were coming back and forth for weeks with all kinds of problems.... can I change group, a group member disappearing, arguments how they were going to do it, some not contributing.... too much hassle”.

Student SM2 expressed his opinion

“I have never seen this option in Open eClass..... I didn’t know that multiple users writing together is a possibility, if you had not shown me I would say that it is science fiction. This ability is great although I don’t believe in collaborative work. In my mind, someone will not work at all and will benefit from what the rest of us do, plus what if I don’t agree with how we will approach the work... I don’t think I like group work, especially with group members I don’t know”.

In the few occasions that group work was assigned in the capacity of 2-5 students the collaboration took place outside the platform through face to face, by phone, by email or social communication channels that they were familiar with. It should also be noted that by collaborative activities most students had in mind an assignment that was divided in parts and each one was responsible for completing one part. Upon completion, the parts were put together and submitted and only in the best case scenario one student undertook the task of refining the work to preserve a red thread.

Instructor IM4 specified the problem

“The pedagogical methods are great but how can they be applied in a group of a hundred to two hundred students? If I had a group of 20 students yes.... now it is impossible to monitor and guide so many students. Besides, first I would have to teach them what collaboration means.... they have not done it before and they are not interested”.
Student SH3 explained collaboration as

“I had group assignments in some classes but we never used the wiki or Open eClass in general to work together. Either we worked at campus for things like findings books at the library or articles which then everyone took home to do their part or we used Skype”.

Collaboration in TEI is in its infancy as it is not cultivated to students from an early age and in some cases it is confused with cooperation. Some instructors have made attempts to gear education towards that direction. However, most of them did not know how to apply this pedagogical method to the large volume of students in their classes and others felt that they needed guidance on pedagogical methods to structure their course accordingly.

4. Organisational and cultural barriers to exploitation

In previous themes we have presented the perceptions of the users, instructors and students, on Open eClass. Through their perceptions emerged organizational and cultural issues that prevent full exploitation of the platform’s capabilities.

Regarding the organizational issues the most important factor is the lack of training.

As both instructors and students pointed out, the familiarization with the platform depends on personal experimentation with it.

Instructor IM1 expressed a complaint that she had to check functions herself, so that she could transfer her knowledge about the platform to students and that was not always possible. We could relate to that, because we needed to create multiple accounts in order to experiment with what the instructor sees in the modules versus what the students see. In her own words,

“I am not familiar with many communication and interaction options in Open eClass, so I can’t make them available to students… how I can give them something to use when I myself don’t know how it works. There is a tutorial document, but it is hard to figure out the details through it without experimentation”.

Instructor IH3 could relate to the above concern herself

“I have computer knowledge and I can understand how Open eClass works, but I can see that someone without this type of knowledge would have a hard time figuring it out”.

Training is an issue for the students as well, at least those who had more exposure to the platform.

As student SH3 mentioned,

“I don’t think the whole approach towards the platform is right. For example, I was aware about forum and when I needed it in another class I asked for it to be activated. I am sure that more students would ask for it as well if they knew how to use this function and the platform in general”.

Another issue is lack of common strategy on the exploitation of Open eClass to accommodate communication and interaction. Even within the smallest units, which are specific departments within schools, there is a range of minimal to higher use.

Instructor IH1 explained in detail
“It is hard to maintain a sustainable communication and interaction through the platform, when there is no active participation from all members of the department. For instance, in a class of one hundred students divided among two instructors I was the only one monitoring the forum, because my colleague did not know and did not care to use it.”

On this issue the students’ opinion was that there is no common stance by the instructors towards the use of the platform. Since it is not a common practice to use the platform, they have not been accustomed to work through it.

Student SM3 described the situation as,

“Some instructors urge us to use the platform more and others just refer to it for retrieving course material. This confuses us as to the importance of the platform and how much we should be using it. I don’t feel like it has become a part of my everyday life, because some instructors respond and others don’t, so I can never be sure if it is worth the effort”.

Another issue, raised by all instructors, that hampers the use of Open eClass is related to the large number of students that attend each class which subsequently leads to work overload. As a consequence there is no time left to exploit the more sophisticated functionalities.

Instructor IM3 described this problem as,

“The classes are big, the feedback I give to the students…. not all of them, just where there is room for improvement, already takes more time than I have available, because it is just one thing of the many I have to do. There is a contradiction on what we are because for the students, I have to teach, correct assignments and provide feedback, however, I am promoted based on my researches and the papers I publish and within my duties is also to perform certain administrative tasks. From all these that I mentioned I can tell you that I am spending more time using the platform than I can afford”.

Similarly, instructor IM2 added,

“There is an everyday contact with the students, there is no need for more communication through the platform.......... we don’t have time for more”.

In the same context, the students realized the instructors’ constraints on using the platform in a more sophisticated way, but they think that they could manage to make an effort.

Student SM4 explained,

“I suppose it is time consuming to correct all our assignments, but while they put the grade I think that they could include some comments as well. It would definitely help us learn from our mistakes or omissions and do a better job next time”.

Finally, there was a notion by some instructors that they were doing enough activities already to justify the usage of the platform within set boundaries and adequate involvement that did not overburden them.

As instructor IM4 described it,

“I believe that there should be a balance between time-consumed and accomplished results. These tools are pretty good up to a point that serve my needs and help me save time, but I don’t intend to spend time for more demanding
activities. I feel that I am already spending too much time for this tool and administrative work, whereas I should be concentrating on research”.

Instructor IM2 added,

“When you reach a point that things work good for you there is no need to complicate matters. You say, ok we are fine like this. When you add more you could create chaos and lose control”.

A cultural issue that came up related to collaborative activities. The instructors highlighted that the students come to higher education with no previous knowledge on how to perform collaborative tasks. On the same token the student had some reservations working with others, because as they said they wanted to control their own work and not be depended on others.

Instructor IH2 brought to our attention that,

“I believe that it is the Greek educational culture that does not help collaborative learning. I think that the students have not learned to expose themselves to their peers. This requires a lot of effort and training that should start from elementary school”.

Instructor’s IH4 view on the subject was,

“Although I try to assign collaborative tasks, there was a lot of groaning and moaning before the idea was accepted. Matters got even worse when I attempted to form the groups mixing up student and breaking formed alliances. Still, we have ways to go before the platform can become a collaborative environment”.

Student’s SM1 opinion on collaboration was,

“I have learned from my early school years to depend on myself, this is what is required to be successful in the national exams to enter higher education and this is the way I have learned to work. I find the idea of peer-to-peer evaluation very discomforting”.

Another cultural issue is the infatuation that students exhibit towards social networks such as Facebook. It became evident from the interviews that the students have managed to incorporate these networks to their studies. Their reasoning behind this is the ability to maintain their privacy, and express themselves freely in a friendly and direct manner. One of the instructors mentioned to us that she belongs to student’s Facebook groups in an attempt to approach her students.

As IH4 told us,

“Sometimes when I want my students to view an interesting posting I usually post it on Facebook. It is faster to do and I am sure that they will see it because they are in all the time. In a way that makes sense because it is a social and not scientific medium, so it is more appealing to them”.

Student SM5 describes the issue as

“I would be skeptical to post to a discussion in the platform. There you have to be careful of what you say and how…… you don’t want to get on the wrong side of the instructor. Besides, there is Facebook…. there you can say anything you want, you know…. you can really express yourself”.

Instructor IH1 points to Facebook for student interaction
“In Facebook the students feel free to express themselves without me inspecting and watching. It’s understandable that they want their privacy”.

It is evident that there are a lot of organizational and cultural issues that inhibit the full exploitation of the platform and the disposition of the institution as a structured organization does not help to turn the situation around.

5. Ideas for improvement

During the interviews we asked both instructors and students to express freely their ideas and suggestions that would enhance users’ interaction and communication to generate meaningful educational experience without considering technical and economic constraints.

Both students and instructors recognized the need of formal training on the capabilities of the platform. However, it was noted that mere presentation of the functionalities and what they can do is not effective. They proposed the training to be an example in practice to illustrate the functionalities of the platform. Subsequently refreshment seminars should be performed regularly each semester and ideally a video recorded version of it to be available for reference. Specifically, the instructors mentioned that it would be really helpful if a team of experts, proficient in platform use with pedagogical knowledge, could assist them structure their courses on the platform in a way that incorporates pedagogical principles. However, they also expressed some concerns about their time limitations.

Instructor IM2 proposed,

“Training is needed, but not the kind that goes for hours presenting one by one the modules. What we need is to see and have available for review a course set up using the modules, so we can get ideas about what would be useful to incorporate based on the nature of the course we teach”.

Instructor IH1 specified,

“Training is needed, but it should be different based on how much the user has been involved so far. I see that there is a need for a group of specialists, not only to support instructors with technical aspects, but show them how the modules can be utilized in a pedagogical way as well”.

Furthermore, the students pointed out that this should be done at the beginning of their studies, so they can experience the abilities of the platform, come to appreciate what it offers and have it become part of their educational culture.

Student SM3 suggested,

“What is needed is training right from the start of our studies. We need to be informed about what is available and come to appreciate the benefits”.

Student’s SH2 opinion was,

“What it needed is, for everyone and I mean instructors too, to know how the platform can be used to support our learning and once we have that under our belt to make it a regular practice, the same by all”.

Another idea that the students had to make the platform more appealing to them was to incorporate in the platform synchronous communication channels. They mentioned that they would like to have the ability of live video communication and
teleconference with fellow students or the instructor and an indication for whether or not they were available.

Student SH1 felt that Open eClass had to be reformed,

“I would like Open eClass to be more personalized…… to have a picture, with instant messages, conference abilities, live communication and definitely a more friendly background…. the one it has now makes it hard to see”.

Student SM2 added,

“Video call and conference call is what it is needed…… it would replace phone calls and the need to include our peers in our skype accounts. This way, we could separate our social life from our school life. Right now my skype contact list is so long I get lost in it”.

The idea of synchronous communication channels in the platform was expressed by some instructors as well.

Instructor IH3 characteristically mentioned,

“If the platform had synchronous functions like the video and chat in Facebook or skype it would make a difference. I think it would entice students to be in it so they would get used to using it”.

Furthermore, since all students possess a smart phone and they use it to connect to internet, they all proposed the development of an Open eClass mobile app with sound or visual notification for every new posting.

Student SH3 seemed confident that,

“I think that I would be a fan of Open eClass if it was a mobile app. I would be in it all the time”.

Student SM2 noted that,

“I use my mobile to connect to the internet. An app for Open eClass would allow me to get in anytime I wanted to. Another important feature would be indication and notification for new postings. This way I wouldn’t miss anything”.

The instructors also mentioned that they would benefit from an Open eClass mobile app, as it would enable them more freedom and flexibility.

Overall, all ideas expressed by instructors and students were very interesting and gave us a reference point to take with us to the next step in applying Soft Systems Methodology.

4.2 Overview of Interview Empirical Findings

The thematic analysis of the interviews identified five themes under which relevant findings were grouped and summarized as follows:

In the first theme, “the platform as a means for disseminating course material”, the findings emerged that it was a regular practice and it was valued. It enabled instructors to organize course material and distribute it within less time and in an inexpensive manner. This ensured transparency since it eliminated ambiguities while it made course material readily available.

In the second theme, “the platform as a means of information exchange”, the findings revealed a one way communication directed from instructors to students as a regular
practice. In all cases it was the instructor who determined the level of communication performed through the platform. Although the platform was not an appealing way for students to communicate, they expressed an interest in enhanced communication activities such as receiving feedback through the platform. Instructors seemed skeptical on this matter due to the additional work it would require.

In the third theme, “the platform as a means of interaction and collaboration”, the findings indicated that the collaborative capabilities of the platform were not exploited. Additionally, enhanced interaction such as forum discussions were rarely performed. All in all, it became evident that there was lack of pedagogical skills which would enable the cultivation of interaction and collaboration through the platform.

In the fourth theme, “organizational and cultural barriers to exploitation”, the participants highlighted their lack of training, the institution’s lack of common strategy and the enrollment of large numbers of students per class as barriers to the exploitation of more sophisticated functionalities of the platform. Additionally, it was also indicated that the lack of collaborative culture along with the students’ preference to other social media for communication purposes further inhibited the utilization of corresponding platform capabilities.

In the fifth theme, “ideas for improvements”, it became evident that there was an imperative need for formal training based on examples in practice followed by refreshment seminars. Additionally, the formation of a group of experts with technical and pedagogical expertise to assist instructors build their courses in the platform according to pedagogical methods was requested. Lastly, there was a suggestion to develop an Open eClass mobile app and incorporate synchronous communication channels in the platform.

An outline of the summary of interview findings, within each theme, is presented in table 4.1. In detail, the five themes are listed in a column while next to each of them are placed the findings that correspond to this theme.
<table>
<thead>
<tr>
<th>Themes</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 The platform as a means for disseminating course material</strong></td>
<td>• Platform favored for organizing course material and distributing them to students with less time overhead and inexpensively  &lt;br&gt;  • Ensures transparency and eliminates ambiguities &lt;br&gt;  • Convenience retrieving course material without place and time limitations</td>
</tr>
<tr>
<td><strong>2 The platform as a means of information exchange</strong></td>
<td>• Perception that the platform is one way communication of instructor to student  &lt;br&gt;  • Level of communication is determined by the instructor &lt;br&gt;  • Most instructors promote communication through email or in person / students prefer Facebook and Skype to communicate &lt;br&gt;  • Open eClass does not provide enticing and functional communication &lt;br&gt;  • Students would like feedback from the platform / some instructors give feedback from the platform whereas others do it through email or in class</td>
</tr>
<tr>
<td><strong>3 The platform as a means of interaction and collaboration</strong></td>
<td>• No use of collaborative Open eClass capabilities such as Wiki and teleconference  &lt;br&gt;  • Forums are rarely used and some users do not know what they are for but users who have used forums liked them  &lt;br&gt;  • Instructors who use forums pointed that they can facilitate collaboration, build a sense of community and help student performance but not used productively with in-depth discussions  &lt;br&gt;  • Cooperative rather than collaborative activities take place outside the platform  &lt;br&gt;  • Lack of pedagogical skills inhibit collaborative practices – need of guidance on pedagogical methods</td>
</tr>
<tr>
<td><strong>4 Organizational and cultural barriers to exploitation</strong></td>
<td>• Lack of training on Open eClass  &lt;br&gt;  • Lack of common strategy on usage of Open eClass  &lt;br&gt;  • Large number of students per class / Instructors work overload – lack of time – reluctance to engage further with more sophisticated Open eClass functionalities  &lt;br&gt;  • Lack of collaborative culture in the educational system in general  &lt;br&gt;  • Students’ infatuation towards social networks (Facebook, Skype) as means of communication</td>
</tr>
<tr>
<td><strong>5 Ideas for improvements</strong></td>
<td>• Need of formal training  &lt;br&gt;  • Training based on an example in practice  &lt;br&gt;  • Regular training refreshment seminars  &lt;br&gt;  • Formation of a group of experts to assist instructors with their pedagogical and technical knowledge  &lt;br&gt;  • Incorporation of synchronous communication channels in the platform  &lt;br&gt;  • Development of an Open eClass mobile app</td>
</tr>
</tbody>
</table>
4.3 SSM 1st activity - Finding Out about the Problematic Situation

In the first activity of SSM the objective is to display the actual situation through which a variety of possible and feasible choices is revealed (Checkland, 1981).

The aim of our research was to investigate users’ perceptions on the communication and interaction possibilities of Open eClass with the intent to surface the barriers that inhibit the exploitation of their extended capabilities in order to improve their usage. In order to display the situation, first, we analysed the empirical findings from the interviews which revealed the current perceptions of Open eClass communication and interaction functionalities as well as the barriers that inhibited their more extensive exploitation. In the process, some ideas on how the functionalities would be better utilized were also expressed. Subsequently, the situation was further defined when the participants along with us, as facilitators, drew a rich picture of it. Both these techniques along with our personal knowledge, from working within the researched environment, aided us in carrying out analysis one (the intervention itself), analysis two (social) and analysis three (political).

4.3.1 Analysis One (the Intervention itself)

According to Checkland and Poulter (2006), one important aspect in SSM is the solicitation of different worldviews on the situation, because it is the richness of the inquiry that sheds light to the complexity of the situation and enables the creation of insightful activity models to improve it. Therefore, it is important to determine who holds the key roles, namely “client”, “practitioner” and “owner of the issue addressed” in the particular situation.

- The “client” is the person who causes the intervention to happen. In our case, the researchers had been aware that there were issues and uneasiness about Open eClass from both instructors and students and took the initiative to investigate the situation.
- The “practitioner” is the person who conducts the investigation. In our case, the researchers have undertaken this role which for the purpose of this study coincides with the client’s role.
- The “owner” is the term used for the people who are the beneficiaries of the research. In other words, it is those who are concerned about the situation and are affected by it at the same time. In our case, the owners are the instructors and the students. Actually, in a broader sense, the whole institution could be considered as the owner, since its functions are affected by having a community that is more engaged into learning.

Summarizing on the roles in this case, the researchers, as practitioners acted as facilitators in soliciting the worldviews of the owners in order for the inquiry to emerge insightful ideas for improving the situation.

4.3.2 Analysis Two (Social)

According to Checkland and Poulter (2006), for any change to stand a chance at succeeding, it should be considered not only if it is desirable but culturally feasible as
well. In order for this to be determined accurately, what is needed is to understand the social reality. Checkland and Poulter (2006) propose to successfully identify the existing social reality by examining three elements: the roles, the norms and the values. However, this is not an easy matter as each element is not static, but rather evolves over time and affects or modifies the others.

The role of the instructors in our case is culturally defined as multifaceted, since it contains teaching and guiding students, running researches and performing administrative work. Within these demanding boundaries, where the responsibilities intertwine, the instructors are obliged to respond to all of them which can sometimes be very overwhelming. Regarding Open eClass, some instructors, in their attempt to fulfill the requirements, feel frustrated, as they feel that they don’t have any support or any reward for their efforts. Others have placed certain boundaries within which they limit their activities and are not interested to do anything beyond them. However, many instructors expressed their good will to do more, but they requested assistance especially in regards to pedagogical practices, so they could make learning a meaningful experience.

The role of the students, at the undergraduate level, is to complete each course through the activities set by each instructor in order to complete it successfully. These activities include the level of involvement desired by the instructor in Open eClass. It should, also, be mentioned that the students are raised with a system that bases rewards on individual effort. The clearest example is that it is this individual effort that ensures their acceptance in the Universities. The result from this system is that apprehension mires efforts to engage in collaboration.

The norm in TEI of Athens is not restrictive when it comes to instructors, since there are no set rules regarding their teaching and pedagogical methods. Additionally, there is no common strategy in regards to Open eClass usage but rather recommendations on using the platform.

The norm, when it comes to students, is to successfully complete their studies, but, as young, spirited people, it is clear that they want to engage in many other activities that they enjoy and only spend the minimum effort required to achieve the completion of their studies.

The values are harder to define, since they rely on personal experiences and how one envisages an individual. For instance, an instructor who is demanding when it comes to assignments, but provides feedback to the students, may be considered “good” by some but “unreasonable” by others. Similarly, the instructors characterize the “good” students as the ones who participate and study and label those who keep a distance as “indifferent”. When it comes to judging instructors’ and students’ behaviors in regards to Open eClass, in the current state, there seems to be a lack of motivation from both parts.

4.3.3 Analysis Three (Political)

The Greek educational ministry finances tertiary education, which, other than that, runs autonomously, managed by a Board of elected professors (instructors). Each school has its own management (Dean and Board of School), while each department within a School has its Head of Department and the departmental Board. A
representative from the students’ body participates in each aforementioned Board. Although, there are general rules and regulations that govern School and departmental activities, there are not set rules as far as the teaching methods and techniques are concerned, since they rely on individual experience, knowledge and preferences. In other words, the curriculum for each course is specified, but not the delivery method. This, also, stands when it comes to Open eClass use. The general recommendation from the Management of TEI of Athens is to utilize this specific platform, but it does not go to details regarding the level and extent of the use.

Specifically, in our case, it is the instructors who determine which learning modules of Open eClass will be used and to what extent. The instructor resembles the leader of a group; s/he is the person who sets the “rules of the game” that is played by the students. The students are culturally directed to respect and obey their instructors who are placed at a higher level, regardless of the hierarchical position. However, the representative of the students’ body has the ability to convey issues concerning their education to the Board for investigation and pertinent reformations.

It should, also, be noted that the prolonged recession in Greek has further burdened the instructors, as well as the administrative staff with work overload due to the increased number of students, no replacement of the pensioners and no new hiring of personnel. The increased number of students was the outcome of a government effort to relocate students close to their home in Athens. However, in TEI of Athens, there is a substantial number of students who reside in villages and, because they cannot afford the expense of living in Athens during their studies, they rely on Open eClass platform to facilitate their studies.

All the above insinuate that quality education, at this point, needs to be delivered with less human resources in a more challenging environment.

### 4.3.4 Rich Pictures

It is in the philosophy of SSM that the complexity of human situations derives from the interactive relationships of different worldviews (Checkland and Poulter, 2006). The Rich Picture is a modelling technique that imprints a problematic situation and includes the relevant stakeholders, the structure, the processes and the underlying climate (Checkland, 1981).

In our case, in two extensive workshops our participants (the instructors and the students), in a common efforts with us as facilitators, drew rich pictures to depict the situation through their worldview, as illustrated in fig. 4.1 for students and 4.2 for instructors.
Figure 4.1 Students - Rich Picture
Figure 4.2 Instructors - Rich Picture
4.3.5 Highlighting the Problematic Situation

The Rich Pictures that were created by the instructors and the students along with the discussions that took place during their construction revealed several issues and concerns that illustrate the problematic situation.

The general sense was that all instructors view the platform as a tool that serves them in making their work easier and faster, which means disseminating their course material and information that they need to pass along. Anything beyond that, which requires effort and time, falls at the discretion of the instructor as to whether to engage in it or not. Some instructors utilized a lot of modules, others fewer and some used it just to disseminate their material. The instructors who used more modules were frustrated that the students did not know how to use them, although they had progressed in their studies, and felt that they were wasting their time trying to get students accustomed to them. The students, on the other hand, were annoyed that they had to learn to use something new and change their ways and when they got accustomed to it they were not given a chance by other instructors to take advantage of the platform’s capabilities. This situation got even more complex when the opinions and justifications of the instructors who used less modules or those who used it just to post course material were expressed. Issues such as investing time for questionable benefits, since the students had shown their preference for other means such as skype and Facebook or investing their valuable time to discover how to apply the learning modules by experimenting on their own, since no formal training was offered, came up. Besides, their presence on campus on one hand and no specific directives on how Open eClass should have been exploited by a superior authority, on the other hand, could justify any level of involvement, from none to full exploitation of all the capabilities.

However, this approach confuses the students, since for some instructors the platform is very important and for others it is just another gadget laying around. This makes them turn to other popular and widely used platforms to supplement their learning activities. The functionalities of the platform or its benefits on their learning process have not been presented to them in any kind of training or promotional program and sometimes, based on the instructors that they encounter during their studies, they may never realize what the platform can do. Some mentioned that the instructors do not urge them to use the platform for communication purposes. Others felt that they were not given enough motivation to do so or that the instructors themselves were not actively engaged so as to set a good example. Sometimes the students only used it once to retrieve the posted course material and other times more often, which is the case when the instructors urges them to do more things through it. Because of these fluctuations, the students can justify their apprehension about using the platform.

The bottom line is that, in the current state, a vicious cycle has been established, where students impeach the instructors and the other way around for not taking advantage of all capabilities of Open eClass. However, this approach does not only inhibit the exploitation of Open eClass, but also inhibits taking advantage of the investment in it for enhanced learning. Nevertheless, the current use or misuse of Open eClass has gradually become more problematic due to the recent economic
recession that forces some students not to attend classes, rendering the platform as their primary means for learning.

4.4 SSM 2nd activity - Formulating Relevant Purposeful Activity Models

In this activity of SSM, according to Checkland (1999), the building of the purposeful activity models takes place. Within this activity, first the purposeful activity to be modelled, which is known as Root Definition (RD) needs to be defined. The Root Definitions are constructed based on a purposeful activity as a transformation process (T). Subsequently, the detailed sequential steps of the Transformation Process, from a defined input into some defined output, form the Conceptual Models (CM).

In our case, the models were constructed based on the needs and desires of our participants that were solicited through the interviews we conducted. The ultimate goal of all of them is to enhance the interaction and communication through Open eClass, in order to establish a better blended learning environment that supports a meaningful learning experience based on the constructivist perspective.

Root Definitions

The Root Definitions are notional statements that describe relevant human activity systems that reflect a particular worldview and lead to feasible and desirable changes in a real world situation (Checkland, 1981). Checkland and Poulter (2006) mention that the PQR formula contributes to shaping a Root Definition and the CATWOE mnemonic enriches it.

The PQR formula is expressed by: “do P, by Q, in order to achieve R” and answers to the questions “what does the system do?” “how?” and “why?” (Checkland and Poulter, 2006, p.39).

The mnemonic CATWOE is the acronym to, Customer, Actors, Transformation Process, Weltanschauung (worldview), Owner and Environment constraints (Checkland, 1989; 1999; Checkland and Poulter, 2006; Jackson, 2000). Specifically, the mnemonic elements are described as follows:

- Customers: The victims or beneficiaries of the purposeful activity system
- Actors: The people who would do the activities
- Transformation: The process that describes the transformation from an input to an output
- Weltanschauung: the worldview that makes the transformation meaningful
- Owner: The person who could stop the activity of the system
- Environment: Elements of the environment that constrain the system

Conceptual Models

Once the Root Definition has been constructed and the purposeful human activities, perceived as a transformation process, have been described, a model that provides details on how the transformation will be accomplished needs to be built (Checkland, 1981; Checkland and Poulter, 2006). This model of an activity system is known as Conceptual Model and it describes what activities the system must do. These activities
are expressed by verbs and contain arrows that depict the dependencies among them. Additionally, besides the operational activities that the Conceptual Model describes, it also contains three monitoring and control activities (Checkland and Poulter, 2006). Specifically these are; monitor the activities of the system, define measures of performance (three E’s) and take control action. These monitoring and control activities examine the operations and prevent the failure of the system. In regards to the three E’s, they refer to efficacy, efficiency and effectiveness. According to Checkland (1989) the three E’s refer to

- efficacy: to what extent the system works based on the selected means
- efficiency: the extent of achieving what is defined as transformation using minimum resources
- effectiveness: if the system is doing the right thing in a wider context

In our case, considering the problematic situation along with the participants’ desires, we formulated the following RD with their corresponding Conceptual Models.

### 4.4.1 1st Root Definition and Conceptual Model

**RD - Establishing a cross departmental support group**

This model is based on the instructor's’ suggestions for an efficient and effective training on the usage of the platform incorporating pedagogical methods. Many of the instructors’ argued that they are teachers in higher education because of their research background which does not require pedagogical foundation. Therefore, they felt that they needed a knowledgeable support team to guide them on how to structure and deliver their courses through the platform within a pedagogical framework.

**PQR**

**P:** A system owned by management of TEI that will establish a cross departmental support group

**Q:** by soliciting, as members, individuals with technical and pedagogical expertise

**R:** to assist instructors to build their courses on Open eClass platform incorporating pedagogical methods.

**CATWOE Model**

- **Customers:** Instructors
- **Actors:** TEI management
- **Transformation:** to create a support group of experts
  - **Input:** need to identify experts
  - **Output:** need met by determining a support group of experts
- **Weltanschauung:** to assist instructors lay out, using the platform, course activities based on pedagogical methods
- **Owner:** TEI management
- **Environment:** unwillingness of TEI management to engage into identifying appropriate individuals for the support group, who may probably come from outside the institution
Efficacy: The system identifies appropriate personnel to form a support group.

Efficiency: The management of TEI will perform this activity once and identify the appropriate individuals for the job in minimal time.

Effectiveness: The system establishes the appropriate support group that possesses the expertise to aid instructors build their courses on Open eClass platform incorporating pedagogical methods.

4.4.2 2nd Root Definition and Conceptual Model

RD - Creating a sample pilot course

The model that is presented in this Root Definition has emerged from the instructors’ and the students’ interviews and relates to their desire for training. As many of them expressed, it would be limiting to go through a standardized training where the use of the modules of the platform are described one by one, because they would still need to figure out how each of them could be utilized pedagogically. They expressed the need of incorporating a sample course built on pedagogical principles in the training, so they could get ideas on how they can achieve communication, interaction and collaboration through the platform in their courses.
PQR
P: A system owned by the Schools of TEI which create, a platform based, pilot course with pedagogical methods as a sample
Q: by applying communication and interaction learning activities on Open eClass, while it is taught during the semester
R: to be used for experiential training purposes

CATWOE Model
- Customers: Instructors, Students
- Actors: Instructor
- Transformation: to create a pilot course as a sample for experiential training
  - Input: need to produce a pilot course with interaction and communication activities
  - Output: need met by filling the pilot course with communication and interaction activities
- Weltanschauung: to facilitate instructors and students to understand and appreciate the capabilities of Open eClass on supporting pedagogically designed communication and interaction activities
- Owner: School, Management
- Environment: apprehension of instructors to volunteer for the task, apprehension of students to be engaged in the activities.
Efficacy: The system produces a pilot course with interaction and communication activities based on pedagogical learning methods in corresponding modules.

Efficiency: the system is performed once for future multiple use.

Effectiveness: the communication and interaction activities performed in the platform are rich enough to illustrate the incorporation of pedagogical methods on the platform, hence are capable to enlighten trainees.

4.4.3 3rd Root Definition and Conceptual Model

**RD - Video recording of training session**

This model emerged from the instructors’ interviews and supplements their idea on the training that they need. This idea referred to the creation of a sample course with interaction, communication and collaboration activities, based on pedagogical methods, for training purposes. This model builds on the previous one by creating a video recording of the training session as a supplement and a point of reference.
PQR

P: A system owned by the Schools that will make available an Open eClass experiential training video
Q: by recording a training session that utilizes the sample pilot course
R: to allow instructors and students to watch the training at their convenience

CATWOE Model

- Customers: Instructors, Students
- Actors: Instructor
- Transformation: to produce video recorded training
  - Input: set up video training session
  - Output: upload video recording to department site
- Weltanschauung: to enable instructors and students to reference the video for learning and understanding the usage of communication and interaction modules in Open eClass
- Owner: School
- Environment: apprehension of instructors to expose students’ and instructors’ communication and interaction material. Intellectual property issues

Conceptual Model - to produce video recorded training

Efficacy: The system will make available a video recorded training session.
Efficiency: The video recorded training session is created once for many users to watch at their convenience.

Effectiveness: The video recording fulfills instructors’ and students’ needs to understand how to use the platform. No additional questions come forth.

4.4.4 4th Root Definition and Conceptual Model

RD - Distinguishing Open eClass mobile app specifications

This model reflects primarily the students’ desire to have Open eClass available on the mobile phones as they explained they would more likely use it if it became available to the palm of their hands. As they noted, they have their mobile phones connected to the internet and are looking at them all the time, mostly because of Facebook. Besides, they said that mobile apps warn them with sound for every new notification, which is very convenient. This notion was supported by the instructors as well, although it was not expressed by them as a pertinent demand. This model draws on participatory design principles to ensure the creation of the mobile app is according to students’ desires and needs.

PQR

P: A system initiated by management of TEI that will determine Open eClass mobile app characteristics

Q: by outlining, with a joint effort of developers and users, the desired Open eClass mobile app specifications

R: to produce a mobile app that fulfills users’ needs and desires

CATWOE Model

- Customers: Instructors, Students
- Actors: developers, instructors, students
- Transformation: to determine desired characteristics of Open eClass on a mobile app
  - Input: need to know needs and desires for mobile app
  - Output: need met by outlining mobile app specifications.
- Weltanschauung: to enable instructors and students to access Open eClass learning modules in a trendy and convenient way based on their needs and desires
- Owner: TEI management, developers
- Environment: hesitance of TEI management or the developers to perceive this as a necessary module rather than a luxury, in order to justify their engagement in a series of required actions for its materialization.
**Conceptual Model - to determine desired characteristics of Open eClass on a mobile app**

Figure 4.6 4th CM – to determine desired characteristics of Open eClass on a mobile app

Efficacy: The system outlines Open eClass mobile desired/needed characteristics.

Efficiency: The effort will be performed once and produce the desired outcome due to the direct involvement of the users in the process.

Effectiveness: The Open eClass mobile app characteristics are the desired ones and fulfill users’ expressed needs/desires, since they were directly involved in the design process.

**4.4.5 5th Root Definition and Conceptual Model**

**RD - Performing video communication through Open eClass**

This model reflects students’ desires to be able to perform live video communication with their classmates and instructors, without needing to share their personal skype accounts with them. According to them, when performing group work it would be very helpful for the group members to have available conference call capabilities.

**PQR**

**P:** A system owned by the users of Open eClass that will facilitate live communication and interaction among them

**Q:** by performing live video communication through Open eClass

**R:** to fulfill their communication, interaction and collaboration needs, while they are at a distance
CATWOE Model

- **Customers**: Instructors, Students
- **Actors**: instructors, students
- **Transformation**: to perform live video communication
  - Input: need to video call some users in the course
  - Output: need met by materializing the video call.
- **Weltanschauung**: to fulfill instructors’ and students’ desire to communicate, interact and collaborate through the platform with live video call
- **Owner**: Instructors, students
- **Environment**: reluctance of instructors or students to use video call options in the platform for their communication and interaction needs

**Conceptual Model - to perform live video communication through Open eClass**

**Figure 4.7 5th CM – to perform live video communication through Open eClass**

**Efficacy**: The system allows live video communication through Open eClass,

**Efficiency**: The instructors and the students are able to communicate in a more convenient, appealing and easier way than before,

**Effectiveness**: The instructors and the students do not resort to other live video communication channels to fulfill their needs.
4.5 SSM 3rd activity - Structuring a Debate about the Situation and its Improvement

Once the Conceptual Models have been completed, the third activity begins with a comparison between them and reality in order to generate a structured discussion about the situation and how it could be improved. Through these discussions emerge possible changes that can improve the situation, while at the same time it is ensured to accommodate all stakeholders’ different worldviews.

4.5.1 Comparing the Conceptual Models with Reality

The comparison takes place between the real world, where a problematic situation has been identified, and the systems world, where the Root Definitions and the Conceptual Models have been constructed. According to Checkland and Poulter (2006) there are three ways to achieve this,

- informal approach: identifying the differences to generate debate about which models would be able to enable changes.
- formal approach: creating a matrix with a series of questions which check the models’ activities and their dependencies against reality.
- describing a purposeful action through a story or a scenario based on the model to compare it with that which happens in the real world.

Considering that our study’s participants are not aware of the SSM methodology, we decided that it would be more effective to list the differences of our models to reality. This way we could explain, in a simple and understandable manner, what the differences are between the current situation and the one by the proposed models. These clearly formulated arguments would become the basis of a discussion among all those involved in the study, to find models that can improve the problematic situation with which everyone can live with.

The comparison to reality for each model is performed as follows:

**Model 1 - to create a support group of experts**

This model does not exist in reality. It was described as a request from instructors who were engage in Open eClass communication and interaction activities on the high level. They had the technical knowledge that allowed them to experiment and utilize some of these activities, but they pointed out that their limited knowledge on constructivist pedagogical methods did not allow them to fully exploit the platform’s capabilities. Therefore, in this case it was not so much a matter of what the modules did, but rather how they could be used to promote pedagogical practices through them. Nevertheless, they did recognize the benefits from incorporating pedagogical methods to learning in the platform and expressed the need for the existence of a knowledgeable team that could assist them in building their courses in a way that reflected pedagogical principles.

Other, less experienced with the platform, instructors were not familiar with the communication and interaction capabilities of the platform, since they had never used them. They argued that their time limitations did not allow them to explore the platform’s capabilities in depth, so they concentrated on modules that saved them time
and effort in performing their tasks. They seemed to be satisfied with this status quo, although they agreed that, if they would get guidance and support on how to restructure their courses to incorporate pedagogical methods, they would feel more confident and willing to give them a try.

In this model, the activities describe the process of selecting individuals to form a support group with technical and pedagogical expertise. This is an effort that needs to be initiated and carried out by the management of TEI. However, it is important to note that no additional budget would be required for the model, as there are funding mechanisms in higher education that can cover relevant activities.

**Model 2 - to create a pilot course as a sample for experiential training**

This model does not exist in the current situation. As it stands now, only a few modules are activated for the students and those are mostly for informational purposes.

There are some instructors who perform communication and interaction through the platform, at least to a certain extent, but their activities are individual efforts and not the outcome of a specific departmental directive or pedagogical background. However, it was their configuration of their course on the platform which emerged the idea that such a sample of a course would be useful for other instructors to review and get ideas. Unfortunately, each course is School specific and as such it would be difficult for instructors of other concentrations to relate to it. Therefore, what is needed would be for such a course to be created within each School.

In the development of a sample course, the first activity in the model, “appreciate pedagogical learning methods for the course”, reflects the outcome of a system designed to emerge proper pedagogical methods that should be incorporated in a course based on its particularities. As was specified earlier in the study, the instructors do not possess formal pedagogical knowledge. This obstacle was proposed to be handled by the establishment of a support group who would work alongside the instructors to structure their courses on the platform based on pedagogical methods. The establishment of the support group was extensively described in the first model that was presented. Therefore, the first activity assumes that the pedagogical design of the course to be applied on the platform is set and brought in to this model.

The rest of the activities describe linear steps that illustrate how the outcome to fill the course’s interaction and communication modules with relevant activities will be achieved. The purpose of the model is to create a sample that, when used for training, will enable trainees to understand and appreciate the capabilities of Open eClass to support pedagogically designed communication and interaction activities.

The proposed model requires each School’s initiative to locate for this task an instructor who is willing to accept the responsibility and the challenge. Ideally, this model would be performed in each School but, in case of apprehension from some Schools’ instructors to volunteer, even one School’s sample course could be used by all.

Another issue, that may be encountered, is students’ apprehension to comply with the requirements to create an appropriate sample course. However, through our interviews, we noticed that they were positive towards taking advantage of what the
platform could offer them and seemed willing to work consciously, once they realize that their instructor cares for them. According to their arguments, when the instructors encourage them and lead by example in active participation, the students are actively engaged themselves.

**Model 3 - to produce video recorded training**

This model does not exist in the real world and presupposes the existence of a sample course created for experiential training. In the current situation, both instructors and students have at their disposal a manual that lists the modules and explains what they are for in a few lines. However, both instructors and students declared their reluctance to read through it and the ones who have read it pointed that it didn’t provide them with real insight of what each module can be used for and how. Besides the manual, there is no other formal or informal training available.

During the interviews we conducted, it was apparent that neither the instructors nor the students had a lot of free time to spare. Therefore, apart from a live experiential training, they should be given the option of a recorded version to watch at their convenience. In addition, a video recorded training session could also be proven useful as a supplement for future reference, even when a live experiential training has been attended.

The creation of a video recording of a training session is within the current capabilities of the institution as there is available technical infrastructure and IT personnel to support it. Therefore, this model would not burden the institution financially.

A concern that arises from this model relates to the exposure of intellectual property or privacy issues. Although our participants did not raise such an issue, it should be considered and discussed at School level to address possible particularities that would require special handling. The choice of making the video available only to TEI registered users could be an option to handle intellectual property issues. Additionally, the privacy issues could be handled by acquiring the consensus of the audience to perform the video recording.

**Model 4 - to determine desired characteristics of Open eClass on a mobile app**

The common desire expressed by all students, which was embraced by the instructors, was the creation of a mobile app. In reality this model does not exist and access of Open eClass is limited to pcs and laptops. However, this is not convenient for the students who do not have or do not want to carry their laptops wherever they go. On the other hand, as they stated, they are always connected to the internet and access their applications through their mobile phones. On this reasoning they base their preference of retrieving new postings on their courses from Facebook. However, this requires of someone to be checking the platform and transferring the new postings to Facebook which, although an added effort, has become a regular practice. One of the most important advantages to mobile apps, as the students explained, were the sound notifications they received for new postings. This way, they could be in the platform more often and they would not miss any postings as they do now, since they have to check all modules in every course in order to discover the new posting. Similarly, the
instructors mentioned that a mobile application would provide them a welcome freedom and flexibility.

This model contains the activities of developing the Open eClass mobile app. Specifically, it depicts the process of creating a mobile app, with user participation to ensure that all user desired characteristics are incorporated. Within the activities, the creation of mock-ups and testing based on them ensures the development of a user-centered designed application.

The development of this model depends on an initiative to be taken by the management of TEI of Athens, who has to justify the need to establish a proposition directed to the platform developers, GUnet. GUnet is a non-profit organization, designated to support and update the platform’s functionalities. Once an incoming request is considered helpful to a general audience, there is no financial burden to develop it.

Finally, from the activities included in our model, it is highlighted that the development of a useful app should incorporate users’ active participation in a user-centered design approach.

**Model 5 - to perform live video communication through Open eClass**

Both instructors and students, when asked about the communication and interaction functions of Open eClass, pointed out that the capabilities that the platform offers are not user friendly. For instance, if a user would want to contact someone else, would have to do it through email, as the live chat module does not reveal whether or not someone is in the course and hence available to contact. This limitation drives the users away from the platform to other social communication channels like skype or Facebook, where they can detect who is online and even perform a conference call with video. However, they also pointed out that, in order to take advantage of these capabilities, they would have to include all their classmates in their social accounts, which after a while become cluttered and difficult to manage. The ability to perform such actions through the platform with their student accounts, according to users, would be a welcomed capability.

This model, describes how the users of Open eClass would like the video communication capability of the platform to be. The purpose of the model is to enable the intercommunication among the participants in a course in order to facilitate learning by constructing knowledge through collaboration, discussion, negotiation, discourse and interactions with others.

The development of this model depends on a previously established system that has incorporated a video communication module in Open eClass or contains a link that takes users to a relevant activity that is not built in the platform.

The utilization of the model depends on the willingness of the users to choose this channel of communication over others. The students expressed their desire to have such a functionality available and argued that it would make them use the platform more often. On the other hand, while a few of the instructors mentioned this ability as an asset of the platform, others could not see any practical benefits from it.
4.5.2 Feasible and Desirable Changes

The purpose of conducting a comparison between the models and reality to identify differences, according to Checkland (1989), is to form the ground for discussions among the study participants’ in order to identify possible changes that could improve the situation. The objective of these discussions is to emerge changes which can accommodate all stakeholders’ different worldviews. In other words, it is not a consensus that needs to be reached, but rather configuring the situation in a way that all can live with. The exception of the rule is situations where true consensus can be reached for issues that are trivial and not controversial enough to cause conflict (Checkland and Poulter, 2006). Overall, according to Checkland (1981, p.181), the changes that will be defined through the debate should be “systemically desirable and culturally feasible”. Specifically, the Root Definitions and Conceptual Models should emerge the systemically desirable changes, while the consideration of the characteristics of the situation as well as the prejudices and shared experiences of the people involved, the feasible ones.

In our case, the debate was performed once with the instructors and again with the students during the workshops that were conducted to discuss the formulated Root Definitions and Conceptual Models along with their differences to reality and possible consequences that could derive from them. The workshops emerged the possible changes which our participants considered systemically desirable and culturally feasible.

1st possible change - the creation of a support group of experts

The implementation of a system that establishes a support group, consisting of individuals who have technical and pedagogical expertise, to assist instructors on building their courses on Open eClass platform based on pedagogical methods.

This change is imperative in order to guide the whole educational practice towards new pedagogical ways. The instructors, in their targeted arguments pointed out that technical expertise on the use of the modules in the platform is not effective as only the integration of pedagogical methods can ensure meaningful communication and interaction. This is the reason behind the need of instructors to cooperate with pedagogy experts who know how to transport pedagogical principles to an LMS. In other words, the experts’ team will help the instructors to design activities for the platform based on pedagogical methods where communication and interaction will have a sound meaning. Furthermore, as the instructors pointed out and the students also agreed, this is the first change that needs to be implemented, as it is the cornerstone for a change long overdue.

The debate, during the workshops, on this model to determine if it is systemically desirable and culturally feasible revealed that it is, since everyone agreed that it would be a welcome change which should had been done a long time ago and would not burden the budget of the institution. Therefore, there does not seem to be a reservation on adopting this change.
2nd possible change - the creation of a pilot course as a sample for experiential training

The implementation of a system that creates a, platform based, pilot course as a sample, according to pedagogical methods and contains communication and interaction learning activities, accumulated, while it is taught during the semester, to be used for experiential training purposes.

This change is related to and partially depends on the first proposed change. A sample course, as the instructors concluded, after a debate on the model during the workshop, should be developed preferably for each School, but if this is not feasible then even the creation of one sample course could suffice to serve the purpose. This flexibility eliminated, during the workshops, any cultural or systemic restraints. In other words, if within the faculty of a School, nobody had the knowledge or the desire to be involved in this challenging task, they would not be obliged to do it, since they could use for their training purposes the sample course created by another School. Other than that, all participants considered this model systemically desirable and culturally feasible. The students reviewed the model, as it was reconstructed by the instructors during their workshop and found it comprehensive and capable of meeting their needs as well.

3rd possible change - the determination of Open eClass mobile app specifications

The implementation of a system that determines the characteristics of a mobile app for Open eClass, by outlining the specifications derived from a joint design effort of developers and users, to produce a mobile app according to users’ needs and desires.

This change is considered an ancillary provision of the platform that can eliminate its static use. The busy schedule of instructors and students requires cutting down on any needless wastes of time as much as possible. A mobile app could provide this opportunity since it enables connection to the platform anytime and from anywhere. Once interaction and communication learning activities are assigned to students, it would be a lot easier and more convenient to be able to perform them without place and time limitations. Similarly, the instructors would be provided with more flexibility as to when and from where they would participate in their assigned activities themselves. Another benefit is the sound notifications that apps provide in case of new postings, which ensure that no activity is missed. Finally, it was evident from the interviews and the workshops that the immediate accessibility, which the app offers, would contribute positively in promoting the use of the platform.

Both groups of participants recognized the value of this model, which can be materialized with no financial burden to the institution, as the developers are funded regularly by the Ministry of Education. However, as the model describes, the specifications need to derive from a participatory design process, where both users and developers will work alongside one another to ensure a desirable outcome.

4.5.3 Rejected Changes

The third model, which proposed the production of a video recorded training, was decided in the workshops not to be included among the proposed changes. Although the model was considered by the participants systemically feasible and culturally
desirable, the timing was not deemed appropriate. Specifically, a concern was raised that the sample pilot course had to be tested within a number of training sessions before its value could be assessed. In other words, the training session should be given a chance to run for a while in order for possible deficiencies to emerge and that sufficient time had to be given for possible improvements before it would be finalized into a video-recorded session. Therefore, it was suggested to be considered on a subsequent SSM iterative cycle, when the problematic situation would be assessed again after the implementation of the aforementioned changes.

The fifth model, performing video communication through Open eClass, was reformulated by the instructors to depict the sequential activities which would enable video communication and conference among the users of the platform. However, when it came to the check with reality, the instructors were skeptical about its contribution to communication and interaction for learning purposes, as they could not see how it could be incorporated within a pedagogical framework. Although, we informed them about the students’ opinion that it would facilitate collaboration, they were not convinced, as they detected a desire for socializing rather than learning behind this capability. They argued that, for learning purposes, it would be better to use the forum, which could ensure transparency and availability for all who could benefit from the discussion. Another reason that made the instructors apprehensive was the immediacy that this ability would provide which they feared would further burden their workload. The students were disappointed about the rejection of this model, but they said that they could live without it, since they had other channels to perform such activities.

4.6 Overview of Systemically Desirable and Culturally Feasible Changes

The changes proposed by the participants of the research are summarized in table 4.2, where the title that identifies each change with a corresponding description is depicted.
### Table 4.2 Outline of systemically desirable and culturally feasible changes

<table>
<thead>
<tr>
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<th>Systemically Desirable and Culturally Feasible Changes</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>Creation of a support group of experts</strong></td>
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<td></td>
<td>The implementation of a system that establishes a support group, consisting of individuals who have technical and pedagogical expertise, to assist instructors on building their courses on Open eClass platform based on pedagogical methods.</td>
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<tr>
<td>2</td>
<td><strong>Creation of a pilot course as a sample for experiential training</strong></td>
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<tr>
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</tr>
<tr>
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</tr>
</tbody>
</table>
5. Discussion

This chapter is constituted of three parts. The first part contains the core outcomes derived from the interview findings, which are discussed based on the first research question that they answer and in relevance to other studies. Subsequently, the proposed changes derived through SSM application, which answer the second research question, are explicated and discussed in relevance to pertinent literature. Thirdly, the implications of the study and its significance are exposed and justified.

5.1 Discussion on the Interview Findings

Our research is intended to contribute to the extended literature on blended learning with an emphasis on the technology based interaction and communication which supplements the environment of face-to-face education. In our case, the study was performed in a tertiary educational institution, the Technological Educational Institution (TEI) of Athens which engages in a face-to-face education supplemented by the Open eClass platform. According to the extended literature that we reviewed and presented during this study, it became evident that, although LMSs exist as a norm in Universities and all of them enable communication and interaction activities, these capabilities are not fully exploited. However, another highlighted point within these researches was the common acknowledgement that interaction and communication through LMSs can benefit teaching and learning and contribute to a better learning experience. This capability, nowadays more than ever, needs to be exploited due to the current economic recession that has affected many countries. In Greece, the recession restraints the physical presence on campus of students who have to work or those who come from other parts of Greece and cannot afford to live in the city, where the institution is located.

Our personal experience, working for TEI, had made us aware of the limited usage of LMS Open eClass and upon considering the benefits that could be harvested from the exploitation of its communication and interaction capabilities, we proceeded to investigate users’ (instructors and students) perceptions on the usage of Open eClass in supporting and facilitating their communication and interaction. This was our first research aim within this research. Our approach to solicit users’ perceptions included in depth interviews that enabled participants to elaborate on their experiences, practices and obstacles encountered while using the platform, leading to ideas on how the situation could be improved. This process initiated a reflection on the subject under investigation for both our participants and us, which helped conceptualize a complex situation with multiple worldviews and underlying tensions.

The process of the interviews revealed that all our participating instructors used the platform to disseminate their course material, although it became evident by the students that it is not a regular practice followed by all instructors, since there are courses taught without the implication of the platform. However, both participant groups expressed their appreciation about the platform in regards to disseminating course material. The platform helped instructors organize their material and saved them time and energy making course material available to students. In turn, the
students appreciated the flexibility that the platform offered them in retrieving their course material.

Another aspect that both instructors and students appreciated was the immediate access to the information that instructors upload and students retrieve. However, other abilities of the platform, such as students communicating with instructors or instructor-student and student-student interaction, including collaboration, were not exploited. In regards to this, the instructors pointed that the students were reluctant to engage in these activities when they were initiated by the instructors, while the students expressed that they were not motivated, because the instructors were not themselves actively engaged. Some users stressed that they were oblivious about the interaction and communication capabilities of the platform and others that they were not familiar enough to feel comfortable using them. This obstacle along with the non-existence of a mandatory directive to take advantage of the platform's capabilities has resulted in diminishing its value and therefore its use. Another side effect was the cultivation of an attitude that whatever is performed through the platform and however is achieved, is “plain and simple” enough. In turn, all the aforementioned resulted to lack of motivation and engagement apprehension by both groups who have adopted a rather passive stance.

Overall, the lack of formal training users on the platform, the heavy workload for the instructors, the lack of formal directives about the use of the platform and the excessive number of students attending each course resulted to an inconsistent use of the platform which created tension and confusion as, both groups of users, did not know what exactly should be done, how it should be done and who is responsible for what. Therefore, each group impeached the other for not taking advantage and exploiting the capabilities of the platform. The realization of this fact drove our decision to arrange different sessions with each group while depicting the situation and determining feasible and desirable changes.

In reference to existing literature, our findings are consistent with studies performed in Universities to examine communication and interaction through LMSs, even though they had engaged different research methods (Landry, Griffeth and Hartman, 2006; Jamal and Shanaah, 2011; Vassilikis, Psaroudakis and Kalogiannakis, 2008; Georgouli et al., 2006). The use of platforms to disseminate course material was a favorable practice and was appreciated by both instructors and students. On the other hand, communication and interaction activities through the platform were limited and used mostly by instructors to convey messages to the students. Demanding activities such as providing feedback or collaboration were observed in minimal occasions and the level of involvement depended on the teaching initiatives of some instructors. In regards to collaboration, it should be noted that the way it is exercised, depicts cooperation rather than collaboration according to Dillenbourg’s (1999) distinction on the terms.

5.2 Discussion on the SSM Application

The perceptions of the users on how Open eClass supports their communication and interaction and their consistence to previous research was not unexpected, but it was deemed necessary to eliminate any possibilities that it could had been otherwise. However, our aim was not limited to identifying these perceptions, but rather to
deeply understand the complexity of the situation which would help us to emerge suggestions for improvements based on users’ needs and desires. This aim reflects our second research question: “How can communication and interaction through Open eClass, be improved based on users’ desires and needs” which in a time of economic hardship, fulfills an imperative need to exploit these capabilities in order to reach all students with no time and place limitations.

Soft Systems Methodology (SSM) was employed to answer our second research question. The methodology, which was developed to tackle complex social reality, where multiple worldviews and conflicts have to be resolved into accommodating for all stakeholders changes, was selected as the most appropriate for our case since it portrayed just that. As noted by Checkland and Poulter (2006), the first challenge is to identify the complexity of the situation, which does not remain static, through the eyes of the stakeholders within the situation. This is further entangled by the fact that these stakeholders do not share the same worldviews and may have conflicting interests. Another challenge is that, as learning occurs within the processes of the methodology, new knowledge that comes up changes previous assumptions, hence, requiring the reappraisal and reconfiguration of previously completed steps of the methodology in order to accurately capture the changing flux of the situation under a holistic view. Yet another challenge is to conclude to changes that may accommodate all involved stakeholders. These challenges came forth throughout the application of the methodology in our study and were overcome by our methodical, elaborate and meticulous involvement in the case.

The application of the methodology resulted in emerging possible changes that all affected users could live with. Specifically these changes included, the formulation of a support group with pedagogical and technical expertise, the creation of a pilot course for experiential training sessions and the development, based on participation design, of a mobile application. In existing literature Hilton and Hilton (2013) support our first two proposed changes as they recommend through their study that digital technologies in education need to include pedagogical considerations. Similarly, Hadjerrouit (2008) supports our findings by stating that a successful blended learning environment must be grounded on learning theories and pedagogical principles. Drawing on his classification of blended learning usage in three levels, namely conceptualization, construction and dialogue phase which correspond to cognitive, constructivist and socially situated learning theories respectively, it is worth mentioning that TEI’s blended learning environment is situated within the first level with some exceptions where the second level has been reached. In detail this implies that mainly knowledge is transmitted from instructors to students who are passive recipients with some pre stated exceptions where students construct new knowledge as active participants. The third level where knowledge is constructed through collaboration, discussion, negotiation and interaction with others is somewhat away. This is the level that we are attempting to reach with the implementation of the proposed and subsequent changes. In other words, the proposed changes will set the foundation of combining pedagogy with technology towards a student-centered approach which is currently missing.

Our last proposed change, to develop an Open eClass mobile application, which enables the anytime / anyplace acquisition of knowledge, is in accordance with the
literature that advocates the benefits from incorporating mobile technology in education as attractive and promising means (Bidin and Ziden, 2013). This proposed change, describes the development of a mobile app based on participatory design and draws on the participatory design processes and principles which not only focus on functionality, but rather ensure that the designed product reflects the values of the future users (van der Velden and Mörtberg, 2014). Additionally, Kensing and Blomberg (1998) argue that a good design presupposes the participation of the future intended users during the whole design process.

5.3 Implications for Practice and Significance of the Study

The partial exploitation of Open eClass, that is limited to the use of functionalities enabling convenience and time saving, while maintaining the traditional teacher-centered educational practices, has not contributed in enhancing learning. Therefore, it is suggested to overturn this approach in favor of an Open eClass student-centered approach. This suggestion could be materialized by first providing instructors with the technical and pedagogical support that would enable them to make such a transformation. At the same time, the creation of a pilot course, which incorporates pedagogical principles in it, used as a sample for meaningful training, could cultivate the value of teaching and learning under a social constructivist perspective and overturn the status quo. The researchers believe that the knowledge disbursed to both instructors and students by this sample course will elucidate them and introduce new perspectives that are worth exploring. In all cases, the availability of platform functionalities through all possible means, including mobile phones, tablets and iPads which have penetrated the new generation and are widely used, would only contribute positively towards the adoption of this environment, since culture and existing norms “make or break” a change.

Additionally, we can safely assume that the in-depth interviews and extensive workshops, we conducted with users from various departments, had an impact on the organization. The participating instructors carried on their experience to their colleagues stimulating their interest on the subject, which became evident to us when we were contacted to discuss the findings of the study within the organization.

In general, the study would be interesting for individuals in a variety of disciplines and positions who are concerned about high quality education with the use of LMS. For instance, TEI management could develop a new strategy to enhance the blended learning environment of the institution based on the findings and suggested changes. Similarly, other higher education institutions could review the findings and suggestions which could apply in their case as well. Furthermore, any educational institution which is considering to incorporate blended learning could use the study to design its implementation in an effective way. Additionally, the study could prove useful to individuals or organizations who want to employ Soft Systems Methodology by referencing the application of its stages as described in this case. Finally, the research could be insightful to all future researches on communication and interaction performed through LMSs or in researches geared towards improving these capabilities.
6. Conclusions, Contribution, Reflections and Future Research

This chapter presents in a concise manner the conclusions of the research, highlighting the main points of interest. This part is followed by the contribution of the study and the researchers’ reflections on the deployment of the research. Finally, it concludes with suggestions for future research.

6.1 Conclusions

The aim of this qualitative interpretivist research was double fold. Firstly, we aimed at gaining a deeper understanding of users’ perceptions on the usage of Open eClass in TEI of Athens by focusing on its communication and interaction capabilities. Secondly, based on these findings, we extended our aim into formulating improvement suggestions for the enhancement and exploitation of Open eClass communication and interaction capabilities towards a meaningful learning experience. This aim was accomplished with the engagement of Soft Systems Methodology, which complemented our deep understanding of a complex situation, with its holistic approach and emphasis on considering and accommodating different worldviews.

Specifically, the research questions that this study explores are:

- How do users -instructors and students- perceive the usage of Open eClass in supporting and facilitating their communication and interaction?
- How can communication and interaction through Open eClass, be improved based on users’ desires and needs?

In regards to the first research question, semi-structured interviews were performed and the collected data were analyzed using thematic analysis, which identified five themes. The results indicated that functionalities of Open eClass, such as course content and announcements, were mostly used, whereas sophisticated capabilities, such as forum discussions, feedback on assignments, message exchange, wiki and teleconference, were used moderately to not at all. Therefore, the general perception underlined that the platform was used to facilitate instructors and students post and retrieve course related material and information and concentrated on providing convenience rather than contributing to student-centered learning. As a result, neither meaningful communication and interaction nor collaborative activities, were performed adequately through the platform. Furthermore, it became evident that the students were passive users in a system, where the level of involvement was determined solely by individual instructor initiatives.

The barriers that were identified included the lack of a common strategy on how and to what extent the platform should be used, lack of training and support, lack of collaborative culture, lack of time, too many students to attend to and a general preference towards resorting to other communication channels such as Facebook and skype. However, during the interviews the barriers that were exposed emerged ideas on how to overcome them. These ideas contributed to the formulation of purposeful activity models for improvement changes, which reflect to the second research question.
In regards to the second research question, within the Soft Systems Methodology, we applied the first three phases, since taking action to improve the situation and critically reflect on outcomes so as to repeat the learning cycle and further improve the situation, as it is being reconfigured each time, was out of the scope of this study. In the first phase, the participants’ perceptions which had derived from the interviews along with the rich pictures that they created, during workshops, depicted the problematic situation in detail. This activity, during the application of the second phase, enabled the formulation of relevant models that could improve the situation. These models were evaluated in turn and then modified or, in some cases, reconfigured by the participants, in a subsequent workshop during the third phase. The systemically desirable and culturally feasible proposed changes that could accommodate both groups of users (instructors and students) were the following:

- Creation of a support group with pedagogical and technical expertise to assist instructors in building their courses on the platform based on pedagogical methods.
- Creation of a pilot course on the platform, according to pedagogical methods, as a sample, for experiential training.
- Determination of Open eClass mobile app specifications, based on participatory design, to develop an app according to users’ needs and desires.

Overall, through the study, it became evident that the incorporation of technology in traditional instruction does not constitute effective blended learning (Daniels, 2007), unless the courses that are offered by the platform are based on pedagogical methods and everyone has the training and support to materialize the transition.

### 6.2 Contribution of the Study

In general, this study contributed to the broad area of blended learning providing useful insights on opportunities that emerge and challenges that should be addressed, when technology is incorporated in education through LMS to support face-to-face instruction for better learning.

In particular, this study shed light to the current perceptions of students and instructors in TEI of Athens on interaction and communication that is enabled through Open eClass. The analysis revealed the satisfying aspects of the system as well as the limitations that needed to be addressed. Moreover, this study complements a previous study, on students’ experiences, which was based on the usage of Open eClass in TEI of Athens (Georgouli et al., 2006), as presented in the Introduction under Related Studies. This current study, re-examined students’ perceptions to investigate the current situation and additionally incorporated the instructors’ perceptions in order to form a comprehensive picture of the status quo.

Another contribution is the holistic approach to the context of LMS, using Soft Systems Methodology (SSM) to explore the different perceptions of Open eClass users. The application of this methodology itself is a contribution, since relevant issues have not previously been examined under this prism. Another contribution of the study is the integration of traditional qualitative methods, namely data collection through interviews and thematic analysis, within the SSM application. These two approaches, employed together, assure the capture of rich data and their in depth
interpretation, which in turn facilitates better understanding of the situation under study.

Finally, the identified systemically desirable and culturally feasible proposed changes contribute as ideas for improvement of the blended learning environment in TEI of Athens and might be applicable to other educational institutions as well.

### 6.3 Reflections

The study was conducted based on Soft Systems Methodology. While considering various methodologies, we had a chance to examine in detail various options before we decided to use SSM. In retrospect, this was proven a good choice, as it fruitfully supported us in carrying out this study. We can state this with certainty as, although SSM is a challenging methodology which requires entering the situation to evaluate it, acting, reevaluating and often returning to earlier phases to reformulate already completed parts, it paid off at the end. This way we managed to capture in depth a complex fuzzy situation with conflicting worldviews and underlying tensions, which led to commonly accommodating proposed changes. These tensions were possibly related to asymmetric power relations which were not directly addressed in an attempt to resolve them, but rather they were placed aside to allow exposing accommodating solutions despite of them. In that effort, the workshops to generate Rich Pictures and Conceptual Models were conducted separately for instructors and students contrary to SSM methodology’s directives. SSM methodology is a learning process and we feel that in that aspect we benefited twice, since we learned all that the topic under investigation entailed, while at the same time dived deep in the methodology itself. Additionally, the integration of the traditional interpretivist qualitative data collection and analysis methods within SSM was proven fruitful in our active engagement and deep understanding of the situation. However, the workshops that were performed to draw the rich pictures of the situation and discuss the created models were very challenging. The workshops’ discussions, were very intense and tedious, as the decisions that were needed to be made took a lot of negotiations among the participants.

Another challenge was the process of collecting and analyzing the data. First, it was a challenge to schedule individual interviews at a convenient time for all the participants. This became even more challenging when we were organizing the workshops, where the participants had to be assembled at the same time. Additionally, the data analysis was very demanding, since first the interview data had to be transcribed verbatim and then translated from Greek to English. Subsequently, emerging the themes from the data felt like working on puzzle pieces and required some time with intense discussions among the researchers to sort things out.

A third challenge, working within the area of research, was trying to keep a balance while handling a complex situation which entailed different worldviews, tensions and conflicts. We were consciously self-reflective to avoid being biased. In this matter, the fact that it was two of us involved, enabled us to reflect on each other’s assumptions so as to refrain from any preconceptions.

The challenges, set aside now that they have been resolved, did not hamper us enjoying the process which, although with its ups and downs, gave us the privilege
and the joy to face them as a team. It was very convenient that we both work at the same place and could use an office every day of the week, all hours of the day, to sit side by side and work on this thesis. Therefore, we are both accountable for every word in it. Although, we do not feel that we are in a position to indicate that working in a pair is the best way to conduct a thesis, we can say with certainty that our collaboration worked in the best way for us, as we believe that combining our ideas along with discussing and negotiating about every issue, resulted in a more credible outcome.

6.4 Future Research

In this study the problematic situation, where users did not exploit the interaction and communication capabilities of LMS due to different reasons, which were addressed, was explored. The outcome of the study, based on users’ needs and desires, emerged feasible and desirable changes which could improve the situation. Once, the proposed changes are implemented a future research should be conducted to reevaluate the situation going through a new SSM learning cycle, which will emerge new knowledge to further improve the situation.

Additionally, there is a need for further research on organizational and cultural factors which restrain the usage of LMS to its full potential. Although, some of these issues were addressed within this study, we believe that there is a need for a specific focus on the subject matter.

Furthermore, we believe that it would be proven very effective, if our study was replicated by educational institutions, while taking their unique environment into consideration, in order to establishing concrete strategies on what should be offered through their LMS and how it should be done.

Lastly, the following saying by Walsham (2012, p.91) should be highlighted. He suggests that any research in the Information Systems field

“should embrace other disciplinary contributions”.

Under this prism, our research topic could be fruitfully further investigated through an interdisciplinary effort to capture latent aspects and provide valuable insights that would contribute into

“making a better world with ICTs” (Walsham, 2012, p.92).
References


Inglis, A., 1999. Is online delivery less costly than print and is it meaningful to ask? *Distance Education*, 20(2), pp. 220-239.


Appendices

Appendix A1. Interview Guide for Instructors

We would like to inform you that the interview corresponds to a research that is performed for a master thesis. Please review and sign the informed consent form if you agree with the terms. Also, we would like to highlight that the participation is voluntary, you can withdraw at any time and if you consent we would like to record our session.

Opening questions
1. Please state your name, your status, your department and how long have you been working in this department
2. How long have you been involved in Open eClass and which functionalities of it you have used and which not? (show printout of available options)
3. How would you briefly describe Open eClass (user friendly, supportive, enhances teaching, facilitates learning, time consuming, work overload, is technical support provided?)

Questions
4. Which of the available Open eClass functionalities that promote communication and interaction with students do you use and how? (show printout with the available options: Announcements, Agenda, Exercises, Message Exchange, Assignments, Questionnaires, Forum, Wiki, Chat)
5. How would you describe the existing communication channels provided through Open eClass?
6. Please describe any problems you have experienced or any reservations you may have using these functions
7. Please share any ideas or practices that you think may enhance communication and interaction between you and the students through Open eClass
8. Which of the available Open eClass functionalities that promote interaction and communication among students do you use and how? (show printout with the available options: Forum, Groups, Message Exchange)
9. How would you describe the existing communication channels provided through Open eClass?
10. Please describe any problems you have experienced or any reservations you may have using these functions
11. Please share any ideas or practices that you think may enhance communication and interaction among students through Open eClass
12. Which of the available Open eClass student collaboration functionalities do you use (wiki, forum) and how?
13. Please describe any problems you have experienced or any reservations you may have using these functions
14. Please share any ideas or practices that you think may enhance student collaboration through Open eClass
15. Do you think that technology, in our case Open eClass, can contribute to enhance learning? Please explain by giving an example.

16. How do you think pedagogical methods (student active participation, constructive feedback, motivation, collaboration) could be integrated in the usage of Open eClass in order to be effective?

17. If TEI’s educational strategy included the use of all functionalities in Open eClass
   i) What would it take to entice you to do it?
   ii) What do you need in order to be able to do it?
Appendix A2. Interview Guide for Students

We would like to inform you that the interview corresponds to a research that is performed for a master thesis. Please review and sign the informed consent form if you agree with the terms. Also, we would like to highlight that the participation is voluntary, you can withdraw at any time and if you consent we would like to record our session.

Opening questions

1. Please state your first name, your level of study and your department
2. How long have you been involved in Open eClass and which functionalities of it you have used and which not? (show printout of available options)
3. How would you briefly describe Open eClass (user friendly, supportive, enhances teaching, facilitates learning, time consuming, work overload, is technical support provided?)

Questions

4. Which of the available Open eClass functionalities that promote communication and interaction with instructors do you use and how? (show printout with the available options: Exercises, Message Exchange, Assignments, Questionnaires, Forum, Wiki, Chat).
5. How would you describe the existing communication channels provided through Open eClass?
6. Please describe any problems you have experienced or any reservations you may have using these functions
7. Please share any ideas or practices that you think may enhance communication and interaction between you and the students through Open eClass
8. Which of the available Open eClass functionalities that promote interaction and communication among students do you use and how? (show printout with the available options: Forum, Groups, Message Exchange).
9. How would you describe the existing communication channels provided through Open eClass?
10. Please describe any problems you have experienced or any reservations you may have using these functions
11. Please share any ideas or practices that you think may enhance communication and interaction among students through Open eClass
12. Which of the available Open eClass student collaboration functionalities do you use (wiki, forum) and how?
13. Please describe any problems you have experienced or any reservations you may have using these functions
14. Please share any ideas or practices that you think may enhance student collaboration through Open eClass
15. Do you think that technology, in our case Open eClass, can contribute to enhance learning? Please explain by giving an example
16. How do you think pedagogical methods (student active participation, constructive feedback, motivation, and collaboration) could be integrated in the usage of Open eClass in order to be effective?

17. If TEI’s educational strategy included the use of all functionalities in Open eClass
   i) What would it take to entice you to do it?
   ii) What do you need in order to be able to do it?
Appendix B. Permission to Conduct Research in TEI of Athens

TIMME, GRAMMATHEIAS PROTEDRON- ANTIPOEDRION
& GENIKOU GRAMMATHEA

Τομ. Δήμος: Αγ. Σπυρίδωνος, 122 10 ΑΙΓΑΛΕΣ
Τηλ/Μητρώο: 210 63 86 580-3
E-mail: tsp.gr@teiath.gr
FAX: 210 991 1590
Πληροφορίες:

DEMA: «Είδεια εκπόνησης ερωτηματικής εργασίας»

ΣΧΕΤ.: ΚΟΙΝ.: ΠΡΟΣ:
κ. Κορτολαγιάς Ελισάβετ, ΕΠΕ Τμήματος
Επιμελείας και Διαχείρισης
κ. Φυσικόγλωσσου Δέσποινα
Βιβλιοθηκονόμος ΤΕΙ Αθήνας

ΕΣΩΤΕΡΙΚΗ ΔΙΑΝΟΜΗ:
- Τμήμα Γραφείων Προέδρου, Αντιπροέδρων
και Γενικού Γραμματέα

Ο ΠΡΟΕΔΡΟΣ ΤΟΥ Τ.Ε.Ι. ΑΘΗΝΑΣ

ΜΙΧΑΗΛ ΜΠΡΑΤΑΚΟΣ
ΚΑΘΗΓΗΤΗΣ

ΠΕΤΑΛΦΟΣ ΑΝΤΙΠΡΟΕΔΡΟΥ
ΠΡΟΕΔΡΟΣ ΤΟΥ ΤΕΙ ΑΘΗΝΑΣ

ΠΙΝΑΚΑΣ ΜΠΡΑΤΑΚΟΣ
ΝΕΑ ΑΠΟΣΤΟΛΗ ΜΠΡΑΤΑΚΟΣ

98
Appendix C. Informed Consent Form for Master Thesis

Research Topic
Improving the Interaction and Communication through Open eClass in Blended Learning

Researchers
Fyntanoglou Despina, Kartaloglou Elissavet, Master Program in Information Systems, Linnaeus University

Purpose of the Research
The purpose of the research is to investigate users’ perceptions (instructors and students) on the interaction and communication that is facilitated through Open eClass in TEI of Athens. Moreover, based on users’ desires the study intends to provide suggestions for improving this interaction and communication.

Description of the Research Process
We will conduct interviews to elicit users’ perceptions on how interaction and communication is achieved through Open eClass aiming to emerge constraints as well as suggestions for improvement. Subsequently, we will conduct a workshop to depict the processes, the stakeholders, the climate and the structure of our case in a rich picture. Thereafter, we will conduct an additional workshop to discuss the improvement suggestions.

The Benefits of the Research and the Benefits to You
Firstly, we aim to get a better understanding of how users perceive the communication and interaction through Open eClass and emerge the different viewpoints of the relevant stakeholders. This, will allow us to combine our knowledge on Soft Systems Methodology with the expertise of the users on the subject matter to depict the situation and form possible suggestions. The improvement of communication and interaction through Open eClass will enhance learning in the blended learning environment of TEI of Athens. In turn, these improvements will result to more productive teaching while it will make the learning experience more fruitful and flexible.

Risk and Discomfort
The research does not contain elements that may cause discomfort or risks to the interviewees however during the sessions relevant questions will be asked to ensure the well-being of the participants. The participants’ names will not be revealed to ensure confidentiality and privacy. Additionally, any pictures that may be taken during the workshops will not depict the participants.

Participant’s Rights
The participation is voluntary and the participants may withdraw at any time without giving an explanation. Furthermore, the analysis of the collected data from each participant will be available to her/him upon request.

Access to Interview and Workshop Material
The information disclosed will be handled only by the interviewers, their supervisor and their examiner and they will not be shared with third parties. All collected data will be used only for this thesis and they will be destroyed upon its completion.
**Question about Research**

The participants have the right to ask any questions about the research before, during and after the interviews. Additional information can be provided by contacting the researchers via email (Despina Fyntanoglou df222cv@student.lnu.se, Elissavet Kartaloglou ek222ng@student.lnu.se)

**Consent**

I understand and agree with the above statements.

Yes

No

I understand that my participation is voluntary and I can withdraw from the research any time without giving any explanation.

Yes

No

I understand that I can ask the researcher to remove any data provided by me without any explanation.

Yes

No

I consent to participate in the research study and I allow you to use the information that I will provide in your master thesis.

Yes

No

I agree to audio record our interview

Yes

No

Date of interview: ____________ Place: TEI Athens

Participant's Name: _________________________________________

Participant's Signature: _________________________________________

Researcher Name: Despina Fyntanoglou, Elissavet Kartaloglou

Signature: _________________________________________
Appendix D. Informed Consent Form (in Greek)

Φόρμα συγκατάθεσης για συμμετοχή σε έρευνα

Τίτλος έρευνας

«Η βελτίωση της επικοινωνίας και διαδραστικότητας μέσω της πλατφόρμας Open eClass στην υβριδική μάθηση».

Ερευνητές

Φυτάνογλου Δέσποινα, Καρτάλογλου Ελισσάβετ, Master Program in Information Systems, Linnaeus University, Sweden.

Ο σκοπός της έρευνας

Ο σκοπός της έρευνας είναι να διερευνήσει τις αντιλήψεις των χρηστών, εκπαιδευτών και φοιτητών, σχετικά με τη διαδραστικότητα και επικοινωνία η οποία υποστηρίζεται μέσω της πλατφόρμας ασύγχρονης εκπαίδευσης Open eClass, στο ΤΕΙ της Αθήνας. Επιπλέον, η έρευνα αποσκοπεί να αναδείξει προτάσεις βελτίωσης της διαδραστικότητας και επικοινωνίας βάσει των επιθυμιών των χρηστών.

Περιγραφή της ερευνητικής διαδικασίας

Στα πλαίσια της έρευνας θα διεξαχθούν συν εντεύξεις από τις οποίες θα αντληθούν πληροφορίες σχετικά με το πώς οι χρήστες αντιλαμβάνονται τη διαδραστικότητα και την επικοινωνία η οποία επιτυγχάνεται μέσω του Open eClass, αποσκοπώντας ταυτόχρονα να αναδείξει τόσο οι δυσχέρειες όσο και ιδέες για βελτίωση. Στη συνέχεια, θα διεξαχθεί μια οικοδομική συνάντηση για να αποτυπώσουμε τις διαδικασίες, τα ενδιαφέρομενα μέρη, το «κλίμα» και τις σχέσεις σε μια εικόνα. Έπειτα θα διεξαχθεί και μια δεύτερη ομαδική συνάντηση για να επικυρωθούν οι προτάσεις βελτίωσης.

Τα οφέλη της έρευνας και τα οφέλη για τους συμμετέχοντες

Πρωταρχικά, επιδιώκουμε να κατανοήσουμε σε βάθος τον τρόπο που οι χρήστες αντιλαμβάνονται την επικοινωνία και τη διαδραστικότητα μέσω της πλατφόρμας Open eClass και να αναδείξουμε τις διαφορετικές απόψεις των χρηστών. Αυτό θα μας επιτρέψει, εφαρμόζοντας τη μεθοδολογία «Soft systems Methodology» να αποτυπώσουμε την κατάσταση και να διαμορφώσουμε πιθανές προτάσεις βελτίωσης. Η βελτίωση της διαδραστικότητας και της επικοινωνίας μέσω Open eClass θα προάγει την μάθηση στο πλαίσιο της υβριδικής εκπαίδευσης του ΤΕΙ Αθήνας. Επίσης, η βελτίωση θα συνεισφέρει στην προώθηση της διαδικασίας εκπαίδευσης, ενώ παράλληλα θα διαμορφώσει μια πιο εικαστική και γόνιμη μαθησιακή εμπειρία.

Κίνδυνοι και δυσαρεσκοί

Η έρευνα δεν περιέχει στοιχεία που είναι πιθανό να προκαλέσουν δυσαρεσκοί ή κίνδυνους στους συμμετέχοντες. Ωστόσο, κατά τη διάρκεια των συναντήσεων, οι συμμετέχοντες θα ερωτώνται κατά διαστήματα εάν αισθάνονται άνετα. Τα ανάμεσα των συμμετέχοντων δεν θα αποκρίνονται για να διασφαλιστεί η εικονική συμμετοχή και η ιδιωτικότητα. Επίσης, οι φωτογραφίες που θα ληφθούν κατά τη διάρκεια των συναντήσεων δεν θα αποτυπώνουν τους συμμετέχοντες.

Δικαιώματα συμμετέχοντος

Η συμμετοχή είναι εθελοντική και οι συμμετέχοντες μπορούν να υπαγορεύσουν οποιαδήποτε όρα χωρίς να δόσουν καμία εξήγηση. Επίσης, η ανάλυση των δεδομένων θα είναι στη διάθεση των συμμετέχοντων εάν το ζητήσουν.
Πρόσβαση στα δεδομένα

Τα δεδομένα που θα συλλέγονται θα χρησιμοποιηθούν μόνο από τους ερευνητές, τον επιβλέποντα καθηγητή και τον εξεταστή και δεν πρόκειται να κοινοποιηθούν σε τρίτα πρόσωπα. Όλα τα δεδομένα θα χρησιμοποιηθούν μόνο για το σκοπό της ερευνητικής εργασίας και θα διαγραφούν αμέσως μόλις αυτή ολοκληρωθεί.

Ερωτήσεις σχετικά με την έρευνα

Οι συμμετέχοντες έχουν το δικαίωμα να θέσουν οποιοδήποτε ερώτημα σχετικά με την έρευνα πριν, κατά τη διάρκεια και μετά τις συνεντεύξεις και τις ομαδικές συναντήσεις. Επιπροσθέτως, οι συμμετέχοντες μπορούν να επικοινωνούν με τους ερευνητές για κάθε επιπλέον πληροφορία μέσω email (Δέσποινα Φυντάνογλου df222cv@student.lnu.se, Ελισσάβετ Καρτάλογλου ek222ng@student.lnu.se)

Συγκατάθεση

Κατανοώ και συμφωνώ με τα παραπάνω

Ναι

Όχι

Κατανοώ ότι η συμμετοχή μου είναι εθελοντική και ότι μπορώ να υπαναχωρήσω από την έρευνα οποιαδήποτε ώρα χωρίς καμία εξήγηση

Ναι

Όχι

Κατανοώ ότι μπορώ να απαγορεύσω τη δημοσίευση οποιουδήποτε τμήματος των πληροφοριών που έχω δώσει, χωρίς περαιτέρω εξήγηση.

Ναι

Όχι

Συμφωνώ να συμμετέχω στη έρευνα και σας επιτρέπω να χρησιμοποιήσετε τις πληροφορίες που θα παρέχω για τους σκοπούς της ερευνητικής εργασίας σας.

Ναι

Όχι

Συμφωνώ να ηχογραφηθεί η συνέντευξή μας.

Ναι

Όχι

Ημερομηνία συνέντευξης: ____________ Τόπος: TEI Αθήνας

Στοιχεία συμμετέχοντος: ______________________________

Υπογραφή συμμετέχοντος: ______________________________

Ερευνητές: Δέσποινα Φυντάνογλου, Ελισσάβετ Καρτάλογλου

Υπογραφές: ______________________________
Appendix E. Open eClass Screen Displays

Appendix E.1 Open eClass home page - instructor's view
Appendix E.2 Open eClass home page – students’ view

In this screen shot, all possible learning modules are activated to be shown.
Appendix E.3 Description of learning tools

As shown in Appendices E.1 and E.2 the platform’s home page displays the name of the course which in this case is “test” followed by the activity that the user is in. In these figures, being at home page, it shows “About” which contains a description about the course and any units that are defined within it. The language can be either Greek or English and it can be set in Course Administration. The icons that are available are:

- toggle between instructor/student
- contact teacher
- add to bookmark
- RSS feed

As it is described in OpenOpen eClass documentation the learning modules are:

**Agenda:** Contains course events such as lectures, meetings etc, displayed in chronological order. (Appendix E.4)

**Announcements:** Contains announcements that the instructor posts about the course. The instructor is given the option, while editing it, to send the announcement to the emails of registered users as well. (Appendix E.5)

**Assignments:** In this learning module the instructor posts an assignment (title and description), specifies the due date and time and if it is a group or an individual one (Appendix E.6). Once the students submit their assignments, the instructor can grade it and provide comments to the students (Appendix E.7). Furthermore, the instructor can see, for each assignment posted, how many have been submitted, how many are graded and the deadline. (Appendix E.8).

**Course Description:** This module displays information such as the course syllabus, the course objectives and goals, information about the instructor (email, phone number and office location), the courses textbooks and any other information the instructor wants to share with the students.

**Documents:** In this module the instructor uploads course material which can be grouped and placed in directories, provides links that take the students directly to them, can create HTML files that open up upon selection and displays the available space left.

**E-Book:** In this module there is the ability to upload and present electronic books in HTML format.

**Exercises:** In this module the instructor may post exercises with a true/false, filling the gaps and choosing the correct answer, format. It provides a final grade and can be accessed and performed unlimited times while it holds the final grade of the last time performed. The module facilitates the students to practice their course material and it is meant for self-assessment.

**Forum:** In this module the students as well as the instructor can exchange ideas or post questions relevant to the course (Appendix E.9).

**Glossary:** This module contains terms contained in the course.

**Groups:** This module contains the registered users for the course, both students and instructors. The register users share all the learning modules for the course (Appendix E.10).

**Learning Path:** In this module the educational material is organized in a sequence of learning activities that students are urged to follow in order to ensure thorough comprehension of the course.
**Links:** This module is reserved for all Internet resources, relevant to the course, and facilitates their access by being grouped together in one place.

**Message exchange:** This module enables instructors to send a message to any of their students as well as to a whole group. The students, on the other hand, can send a message to their team members. When this module is used, both instructors and students, can view all incoming and outgoing messages that they have sent, as well as their remaining available space for this function.

**Multimedia:** The area in this module is reserved for the storage and presentation of audiovisual educational material. The instructor has a choice to either add a multimedia file or an external link to it.

**Questionnaires:** This module offers the instructors the capability to run a survey on their course. The survey is anonymous and the instructor can obtain cumulative results on the questions asked along with graphical representations of them.

**Teleconference:** This is the only synchronous module in the platform and provides the capability of instant text message exchange among users.

**Wiki:** This module enables students to collaborate on a document by allowing all of them to edit (although not simultaneously), while it maintains a history of the changes.
Appendix E.4 - Agenda

The learning module Agenda is within the active tools and the instructor can make it inactive, hence not shown to students by selecting Deactivate.

The events are listed in chronological order and within the parenthesis is their start time while its title and the duration of it is listed right below. Underneath, the instructor can include a description about the event.

The icons refer to:  modifications  delete  visible/invisible to students
Appendix E.5 – Announcements

The Announcement displays the date posted, the title of the announcement and the text about it.

The instructor, while editing the announcement, has the option to select to send it to the email of the course’s register users as well.
Appendix E.6 – Assignments

The instructor in the Assignment edit screen can specify the title of the assignment, its description, the deadline date and time and if it is an individual or a group submission.
Appendix E.7 – Assignments

Once the students have submitted their assignments, the instructor can download the posted file, input a grade and provide comments. When the grades and comments are posted they are visible by the students.
Appendix E.8 – Assignments

In the Assignments learning module, the instructor can monitor the assignments as to how many submissions have been posted and how many have not graded yet, and what is the deadline.
This module, once activated by the instructor, displays discussion topics that have been created on a particular subject. Also, it displays the number of posts that have been performed as well as the date, the time and the name of the person who had performed the last post.

The icon enables the user to be notified by e-mail about a new post in the specific subject.
Appendix E.10 – Groups

In this instructor's view of module “groups”, it is specified whether or not the students are allowed to register themselves in the course and if they can belong to more than one group. It shows how many students are assigned to groups, how many have not been assigned yet and the total number of registered students.

Through this module, the instructors may activate tools such as documents and forums, while they can specify if the forums are restricted to group members only or they are open access.

Additionally, the created groups are displayed along with their assigned tutor, the number of students that are registered in them as well as the maximum number of students allowed, per group.