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Students' perceptions of highly interactive, reflective and process oriented eLearning courses

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ABSTRACT

The purpose of this research thesis was to research the perceptions of students and requirements for a highly interactive and process oriented virtual learning environment. The participants came from two courses: Software business course at Tampere Polytechnic University, in Tampere England and eLearning Professional course at Open University in United Kingdom. A qualitative research approach was used. On the basis of the research it is quite obvious, that the pedagogical setting of the before mentioned courses sets very specific requirements for the implementation of the courses. Specific recommendations were also made for the practitioner as well as suggestions for further research.

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TIIVISTELMÄ

Tämän tutkimuksen tarkoituksena oli tutkia opiskelijoiden käsityksiä ja vaatimuksia voimakkaasti vuorovaikutteiselle ja prosessiorientoituneelle virtuaalioppimis-ympäristölle. Osallistujat tulivat kahdelta eri kurssilta: Ohjelmistoliiketoiminta Tampereen Ammattikorkeakoulussa ja eLearning Professional kurssi Open University:ssä Englannissa. Tutkimusmenetelmä oli kvalitatiivinen. Tutkimuksen perusteella on selvää, että edellä mainittujen kurssien pedagoginen asetelma asettaa selkeitä vaatimuksia kurssien toimeenpanolle. Seikkaperäisiä toimenpide-ehdotuksia tehtiin myös käytännön opetustyöhön sekä ehdotuksia jatkotutkimukselle.

Students' perception of highly interactive, reflective and process oriented eLearning courses

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1 eLEARNING: AN INTRODUCTION

The traditional delivery system in universities and colleges has for a relatively long period of time been the predominant mode in a classroom with a professor giving lectures to students and them listening and making notes. Interaction between the professor and student has been perceived to be a crucial learning ingredient in this delivery platform. Innovations in educational delivery thinking and mechanisms have, however, challenged this. These include for example interactive and reflective schools of thought (Schon, 1987, and Clegg, et al., 2002).

Progress in information technology has enabled the use of re-born educational delivery methods such as distance learning to obtain new existence. Furthermore the progress in IT has escorted a completely new paradigm, eLearning. As an outcome of this, most universities and colleges have entered this new eLearning world in a major way. For this reason the need for pedagogical and technical knowledge to teach in the Internet has emerged, and this knowledge is slowly becoming a core competence for many teachers. The essential question here is that how and to what extent is eLearning and the information technology skills required actually going to change the essence of teaching. Also what are the ingredients for efficient eLearning in various educational courses?

To start with it is important to define eLearning. According to Wikipedia and Interlera, eLearning can be defined as follows: “E-learning means an approach to facilitate and enhance learning through the use of devices by electronic means like computers and communications technology. Communications technology enables the use of the Internet, email, discussion forums, and collaborative software” (Interlera Training Solutions for Software, 2006 and Wikipedia, 2006).

Some researchers have even predicted that the traditional classroom will disappear (Blustain et al., 1999 and Drucker, 1997). After about ten years of experience in the eLearning era, it can be said that this kind of prognosis is probably not going to happen any time soon, but it is true, however, that eLearning has entered the education as well as the corporate world in major way. ELearning is becoming a

major force in the most parts of the education world and complements in many ways the traditional delivery methods. It has enabled the entry of many new market segments, like adult learners, in a major way back to the learning world.

How the learning actually happens in eLearning is a major question, however. In the words of O'Malley et al (O'Malley et al., 1999): "*The overriding question that must be addressed is how will these new educational delivery approaches that move away from the basic face-to-face relationship between a professor and students impact student learning and student perceptions of learning*". And furthermore: "At many institutions, the effectiveness of distance and on-line learning methodologies has not been well researched prior to adoption."

The purpose and objective of this research is to study students' perceptions and characteristics of the courses in two specific courses, Software business and Tampere Polytechnic University in Tampere, Finland and eLearning Professional course at Open University in London, United Kingdom (NOTE: this latter course was included for comparative purposes only). The nature of the class, the characteristics of eLearning and pedagogical requirements will have an impact on this. The objective is to better understand students' perceptions regarding the effectiveness of the delivery of a highly interactive and process oriented course, like the Software Business and eLearning Professional courses, using the eLearning approach. According to Löfström et al. (Löfström et al., 2005): "Teaching as a core task has been broken down into its' constituent parts, such as the definition of learning objectives, core substance and contents, and the choice of appropriate methods for teaching and evaluation." The essence of this research is to concentrate on the appropriate methods of teaching. It is the belief of the researcher that the other parts of the teaching process should not change. This research is particularly relevant and acute for the educational world today. Not very much attention has devoted to the pedagogical aspects of specific courses using the eLearning approach.

Initially the theoretical findings will help the researcher to better understand the framework for the students' perceptions regarding eLearning and traditional delivery methods. Next the research method and methodology will be chosen. Finally the findings and conclusions will be presented.

2 PROBLEM STATEMENT FOR THE RESEARCH

The issue in this research project is to study students' perceptions regarding the features of an eDelivery platform for teaching a highly engaging, interactive, and process oriented course (like Software Business and eLearning Professional). The two important angles to this research are:

1. Pedagogical options
2. eLearning and its possibilities to enable various learning opportunities.

All these dimensions are important for the facilitation of any course in the Internet.

3 THEORETICAL FRAMEWORK

3.1 PEDAGOGICAL NATURE OF SOFTWARE BUSINESS COURSE

Software industry is globally one of the fastest growing industries (University of Washington, 2006 and Jorgenson, 1999). Software products are also more and more becoming one of the key enablers in other industries, and largely drive and facilitate today's economy and business (Lee, 2002). However, software business contests the companies both in the technological and managerial perspectives. The relationships between technological obstacles and opportunities, and new emerging business strategies and up-surging competition create potentially a complicated collaborative network that is difficult to manage (Finne, 2006). Success in software business depends on how a company can organize itself in order to achieve a perfect match between its' strengths and weaknesses and the opportunities in the marketplace (Haverila, 2004).

Broadly speaking the software business course should include following items:

1. Understanding the difference between software products and services
2. Competing with software products and creation of standards
3. Understanding the **main characteristics** of software business (software business vs. traditional business)

4. Understanding the **main segments and segmentation** in software industry and selection of target market segments
5. **Developing the marketing plan for** software products
    a. Product development
    b. Pricing
    c. Promotion
    d. Distribution
6. Organizing and managing software project business and related services

What does the development of a software business course require? Is the issue just remembering simple facts or is perhaps more required. It is obvious that different courses require different kind of learning and thus the course has to be planned accordingly.

When evaluating the previous question, it might be useful to use a generally accepted theoretical framework for this purpose. Bloom (Bloom, 1956) provides a theoretical framework for classification of behaviors resulting from educational processes and evaluation of the extent to which students learned the desired behaviors. The cognitive field, prevalent in a majority of educational courses, consists of learning that is demonstrated by recall of knowledge and intellectual skills including:

- Comprehension of information,
- Organization of ideas,
- Analysis and synthesis of data,
- Application of knowledge,
- Alternative evaluation and choice, and
- Problem solving.

Bloom defined six levels of learning objectives within the cognitive field. These levels represent a hierarchy of complexity of learning skills ranging from simple recall and fact recognition at the first level to increasingly more abstract and complex mental levels culminating with evaluation reflected in the student's application of learned behaviors. Bloom's classifications of learning objectives in the cognitive domain are:

1. Knowledge - remembering previously learned material.
2. Comprehension - grasping the meaning of material.
3. Application - using learned material in new and concrete situations.
4. Analysis - breaking down material into its component parts and understand its organizational structure.
5. Synthesis - assembling parts together to form a new whole.
6. Evaluation - judging the value of material for a given purpose.

Bloom perceived these goals as the "*intended behaviors, which the student shall display at the end of a time period of education*" and a developmental process through the learning objectives hierarchy, each intended objective building on an achieved antecedent.

By applying specific verb terminology related to each of the learning objectives it becomes possible to define specific behaviors to evaluate successful achievement of a learning objective. Some of the verbs related to each of Bloom's learning objectives include (Baker, 2002):

1. Knowledge: arrange, define, duplicate, memorize, recognize
2. Comprehension: classify, describe, identify, report, restate
3. Application: apply, choose, illustrate, solve, write
4. Analysis: analyze, categorize, criticize, distinguish, test
5. Synthesis: assemble, collect, manage, organize, propose
6. Evaluation: argue, assess, choose, value, evaluate.

Now the question is that what is required from a software business course. Using the Bloom's taxonomy as a framework, the following conclusions can be drawn.

1. Knowledge - remembering previously learned material

In the software business course it is important to understand the basic concepts and terms of business and business planning. Otherwise the development of business plans, mission statements, visions statements, values, selection of target markets and development of marketing plans etc. becomes impossible. If the learners do not have this understanding from previous courses, it is important that the class provides this information. All participants should have this knowledge as a prerequisite before

entering software business class. Therefore this lowest level in Bloom taxonomy as a goal is not a sufficient level for this class.

2. Comprehension - grasping the meaning of material

In the software business course it is important to be able to comprehend the material used, but again this is not to be viewed as a sufficient level of behaviors resulting from educational process in the software business class. Mere comprehension does not suffice for the development of software business.

3. Application - using learned material in new and concrete situations

In the software business course it is imperative to be able to apply the concepts used in the course in new situations. It is also important to be able to move to the next level, i.e. analysis of the market place, competitive environment and other environments.

4. Analysis - breaking down material into its component parts and understand its organizational structure

In order to be able to develop a successful software business, it is again vital to be able to analyze the environment in a broad sense, and most importantly what is happening in the market place, what customers actually want and how their desires are changing. But even this is not enough.

5. Synthesis - assembling parts together to form a new whole

The participants to the software business course need not only to be able to analyze the data, but also draw conclusions from the data, i.e. transfer the data into information.

6. Evaluation - judging the value of material for a given purpose.

Finally the participants need to be able to evaluate the value of the information. At the end of the day, it is not sufficient to be able to transfer the data into information, but also to be able to see the value of the information and turn it into viable business ideas and action plans.

As a conclusion, the highest level in Bloom's taxonomy is required for a course like software business is. This will have a significant effect on the course design for the class. It is important to build such elements into the software business eLearning course, which enable the achievement of this level.

3.2 eLEARNING AND PEDAGOGY

eLearning has experienced a tremendous growth during last decade or so. By 2007, it is anticipated that the eLearning market will have grown to $40 billion (Washington Times, 2002).

The term e-learning (electronic learning) covers a wide set of applications and processes, such as web-based learning, computer based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN[1]), audio and videotapes, satellite broadcast, interactive TV, and CD-ROM (Learning Objects, 2006).

According to Marsh et al. the eLearning approaches can be divided into the following categories (Marsh et al., 2002):

1. **Technology in Lecture Presentation** - Multimedia, presentation software, computer software, and other applications used within the context of a traditional, self-contained classroom. Technology replaces chalk and the overhead projector.
2. **Course Syllabus on the WWW** - Many individual professors, colleges and institutions post online syllabi for courses. In most cases these are electronic replicas of paper syllabi, but sometimes there are also internal links and resources for students.
3. **Web-Assisted Course** - A web-assisted course refers to any traditional course that provides all or substantial portions of course instruction by means of the WWW for students enrolled on campus. Students are not solicited as "distance education" students but are carried as regular on campus enrollments and the course is likely to show on IHE[2] records as a traditional class with a time and room assignment.
4. **Distance Education** (Synchronous or Asynchronous or a mixture) - Excluding correspondence, there are two general kinds of distance education:
    a. ***Synchronous.*** Some IHE's use satellite, cable, and direct broadcast of

[1] Local Area Network, Wide Area Network.
[2] Institute of Higher Education

live television to include students at remote sites. Other variations are videoconferencing through computer connections, "whiteboard[3]" conferencing, and various "chat" applications.

b. ***Asynchronous.*** There are several variations of asynchronous instruction including mailing videotapes to students, compressed video, e-mail, and comprehensive web-based courses.

This categorization also describes the level of the use of the possibilities of eLearning. The minimum level is the use of technology in lecture presentation and the maximum is distance education (excluding traditional correspondence courses) either in synchronous or asynchronous mode.

eLearning will change the methods of learning and what it means to go to school or university. It has the promise to overcome the challenges of time, distance and economics. With technology advances, learning will become more integrated with various aspects of our lives in unparalleled ways. eLearning has been claimed by many to be the next wave in school transformation.

eLearning is referred to as "**disruptive technology**" by Harvard business professor Clayton Christensen (Christensen et al., 2003). Alternatively it can be called a new paradigm for learning. Professor Christensen describes disruptive technologies as alternatives to sustaining technologies credited with improving a dominant, established product's performance. Disruptive technology looks at problems in completely new and creative ways. Also eLearning challenges the traditional way of doing things, creates new alliances between various educational and commercial entities, and presents new ways of solving old problems. The demand for high-quality teachers with new skills and competencies will increase, and as indicated earlier eLearning skills required by the teacher is becoming a core competence of the teacher. Perhaps their role will change from importers of knowledge to facilitators of knowledge. Dr. Yong Zhao and Dr. Paul Conroy of Michigan State University (Zhao et al., 2001) see teachers as designers of their own teaching environment, with a variety of technological tools to facilitate knowledge

[3] In the electronic world these are sometimes called "Writeboards", see http://www.writeboard.com/

construction.

Thomas Friedman alludes to the speed of change in his book, The World is Flat, A Brief History of the Twenty First Century as follows: “We are entering a phase where we are going to see the **digitization, virtualization and automation of almost everything** (Friedman, 2005). The gains in productivity will be staggering for those countries, companies and individuals who can absorb the new technological tools.” And further that “Whenever civilization has gone through one of these disruptive, dislocating technological revolutions the whole world has changed in profound ways. Now the question is which educational institutions are the forerunners and which are the followers in this paradigm change. The same question applies to teachers’ education and finally to teachers.

The technology also enables the change of the traditional teaching approach as follows (Michigan’s State Technology Plan, 2004):

Table 1. Comparison of traditional approach and the use of technology in eLearning.

Traditional approach	**Technology allows more of**
Teacher centered learning	Student centered learning
One size fits all instruction	Customization to meet individual needs
One pace applies to all students	Flexible pacing based on student needs
Classrooms and school buildings	Distributed learning from anyplace
Learning during school hours	Learning at anytime
Facts and recitation	Critical thinking and real world context
Individual student performance	Collaboration and dialogue among students and between teachers and student
Textbooks	Up to date primary information resources
Parent teacher meetings each semester	Parent teacher communication daily

All these issues will be addressed in the following. Questions to be answered are:

1. How does one (via the use of technology) make the learning (*please note the use learning instead of teaching*) more student-centered?
2. How does one make (via the use of technology) the learning more customized to meet individual needs?
3. How does one make (via the use of technology) the learning more flexible to pace the learning more on individual needs?
4. How does one make (via the use of technology) the learning distributed?
5. How does one make (via the use of technology) the learning to happen anytime?
6. How does one make (via the use of technology) the learning supportive to critical thinking and real word context?
7. How does one make (via the use of technology) the learning collaborative among the participants?
8. How does one make (via the use of technology) the learning use up-to-date information sources?

The last issue will not be handled because the level of education is at higher level and thus there is no need for parent teacher interaction. It is important to note that trying to maximize the outcomes to the previous questions could be an impossible task as such and there are probably some practical limitations as well. The issue is to try to achieve an optimal level for the combination of all issues for a specific course. These issues are also interrelated, which probably also limits the effort of maximization.

How to make courses more student-centered?

In eLearning learning is almost by definition more of a responsibility of the student (*a better word to be used here is thus the "learner"*). In the words of Kickul (Kickul, 2006) "In a student-centered learning environment, which characterizes most on-line courses, the student must become increasingly self-sufficient, goal-directed, and proactive in how he/she fulfills their responsibilities of meeting assignment deadlines, and having to solve issues from both a course content and technology context.

How to make courses more customized to meet individual needs?

The software business course is a mandatory course for all students involved in the program. This fact is an answer to this issue, at least to a degree. The course should be relevant to software business as such and not overall business development. Also if any kind of projects will be used, great freedom as far as the choice of the topic of the project is concerned should be provided. Furthermore, the platform should provide many different traits for exploration and study (including the library databases).

How to make courses more flexible to pace the learning more on individual needs?

Complete flexibility is not a possibility here (Haverila, 2006). Certain issues can be taken into account, however. The most important is the fact that how much the learner can have an effect on the contents of the class. In this case the most important dimension is the choice of the topic of the collaborative project. There is a high probability that some of the learners have ideas for their software business development projects, and therefore it is a good idea to use these ideas.

Overall, the production of content in eLearning, which is completely based on individual needs of learners, is a difficult and demanding task. In theory, the learners might have very different level of expertise ranging from complete novice to a full professional. Using the taxonomy of Tavangarian (Tavangarian et al., 2004) the levels of expertise are:

1. Novice
2. Advanced beginner
3. Competence
4. Proficiency
5. Expertise

These levels of expertise differ in various grades and practical mastery of the subject matter. In this case, however, it can be reasonably assumed, that the participants have a pretty similar level of expertise.

Furthermore, Tavangarian (Tavangarian et al., 2004) suggest the use of multi-dimensional model when planning the delivery of individual course content. It is important to note that the use of many dimensions and multiple scales produces very easily of very large database of course content, which also requires technologically very advanced delivery platforms and also large amount of work by the facilitator. The *Multidimensional Learning Objects and Modular Lectures Markup Language* is such an XML[4] based description language geared towards eLearning content, which specifically provides methods of content markup supporting the creation of learner specific documents. According to Tavangarian, the foundation of this kind of system is a modular, scalable description format that enables the separation of content, presentation and didactics. That means that parts can easily be exchanged. Based on these features in combination with the generation of individual learning materials a maximum of individual content is possible. Unfortunately the author of this research project does not have the expertise to this technology, and therefore the provision of individualized content is ignored, In addition the need for individualized content in this specific case is questionable. It is important, however, to provide lots of contents in the Internet so that the learners can use and investigate the learning issues at hand as thoroughly as possible.

How to make courses more distributed?

The great advantage of eLearning is the fact that by definition eLearning is distributed. It can happen any place at any time as long as the learner has a computer, Internet connection and access codes to the eLearning platform. **The inclusion of any kind of physical meetings in between of the course limits the issue of distribution.**

How to make courses time flexible?

Again, one of the advantages of eLearning is that at its best it is completely free of time. In an ideal situation learners can start at any time and they can finish their courses at any time. These kinds of courses have been already developed (see f.ex. http://www.matrixmba.net/). This kind of complete freedom is not, however, very

[4] Extensible Markup Language

practical in many cases, and particularly in cases where interaction between the course participants is highly required.

There are some practical limitations to this of course. In most of the cases courses have to start at some point of time and they have to finish at some point of time. **Also in order to facilitate an effective collaboration, time limits have to be enforced.** Other than this the learning and participation into an eLearning course can happen at any time.

How to make courses such that the learning supports critical thinking and real word context?

The software business world requires critical thinking (see the referral to Bloom's taxonomy before). Therefore the mere transfer of lecture material, which is the lowest level of providing eLearning content, is not sufficient. Therefore it is important to include projects, short essays, discussion boards and other elements that support critical thinking into the course. Feedback by the facilitator and other participants should also be supported.

How to make courses more collaborative among the participants?

eLearning has the advantage of making vast amounts of information readily available[5] but has the disadvantage of learner isolation. Research on classroom learning has shown that learning can be very effectively facilitated by students working together collaboratively in groups. According to (Heron, 2006), in co-operative inquiry, people collaborate:

- To define the questions they wish to explore and the methodology for that exploration (propositional knowing);
- Together or separately they apply this methodology in the world of their practice (practical knowing); which leads to new forms of encounter with their world (experiential knowing); and
- They find ways to represent this experience in significant patterns (presentational knowing), which feeds into a revised propositional understanding of the originating questions.

[5] Via Internet, Intranets and library databases for example.

Development of business plans for software business, or any business, is and should be collaborative by nature (Levine, 2006). The participants define the issues of the software business, ex ante, make practical findings, discover issues and make suggestions (ex post). The project should in this class be process-oriented collaboration (Tolis et al, 2006). The outcome is no a tangible product, but through discussion of the readings and progress reports from the subgroups the students, guided, facilitated and moderated by the instructor, collaborate in learning the topics of the course. Each of the students should also be involved in project-oriented collaboration. Groups of about 4-5 students each will produce a project report. This project should require contribution and collaboration of the team members. The additional benefit of this arrangement is that adult learners can benefit from the experience of each other, which in fact can greatly contribute towards learning (Knowles, 2006).

The best results will be achieved when all stakeholders (learners, educators, external experts, customers, venture capitalists etc.) are heard and their opinions taken into account. The minimum level in the case of this research is to try to engage the participants of the software course offering into group discussions enabled by the eLearning delivery platform. Trying to get potential customers, and maybe even venture capitalists involved might the maximum level of collaboration. **Thus it is important that collaborative features like chat, message boards, threaded discussion, online conferencing, email, blogs and list serve are built into the software business courses**. The following table provides some features as an example that encourage collaboration among participants include (Kaupla et al., 2001).

Table 2. Interactive features in eLearning.

Interaction	Explanation	Degree
Software simulation	Learner interacts with software screens like they would with actual software.	High
Branching events	Several options to proceed are offered to learner, who can select what they want to learn about next.	Medium
Scenario based questions	Learners are given a case study and can respond up to three ways. Depending upon how they respond they receive different feedback/direction.	High
Drag and Drop/ ordering questions	Up to eight steps of a process are offered to learners who need to put them in the correct order.	Medium
Multiple choice questions	Standard multiple-choice questions. Learners select one or more correct answers.	Low
Games	Puzzles, Jeopardy type, etc. games are offered with various information.	Medium
Mastery tests	Usually at the end of the course. Ranges from 10-15 questions presented in "a day in the life" of the learner covering all aspects of the content they learned in real life scenarios. If they miss a question, they return to portion of a course for review.	High

eLearning differs from traditional delivery methods in two important regards: time and place. According to O'Malley (O'Malley et al., 1999): "A two-dimensional, four cell matrix can be employed to categorize the above educational delivery systems.

The first dimension is **time** and the second dimension is **place**. The time dimension has two levels, synchronous, which is when both delivery and receipt of course material occur at the same time, and asynchronous, when delivery of the course material precedes receipt of such material by the student. There are two levels of place: same where both the instruction and student reception of instruction occur at the same place and different where the location of the instruction and student receipt of instruction are different. These cells can be further described as current primary

delivery (synchronous and same), distance learning (synchronous and different), on-line (asynchronous and different) and recorded (asynchronous and same)".

Table 3. Instructional mode matrix.

		Place	
		Same	Different
Time	Synchronous	Current method	Distance learning
	Asynchronous	Recorded	eLearning

How do these factors impact learning and how should the delivery mode be designed in order to alleviate the potential problems?

As indicated earlier collaboration in eLearning can be divided into two different types:

- Synchronous and
- Asynchronous.

Although the faculty members may elect to use either or both of these communication modes, the majority of them choose an asynchronous approach. This preference (Passerini et al., 2000) reflects the trend in eLearning programs. The decision between synchronous and asynchronous mode of communication has significant impact on how interaction occurs. Synchronous, such as chat and conferencing require that all participants are "virtually present" at the same time. This has the benefit that collaboration is done in real time and usually produces results most quickly. Asynchronous, such as email, blogs and threaded discussions have the advantage allowing the student to be able to access them any time. As far as the development of the software business course it is probably more beneficial to take on the "Asynchronous" mode of communication, because in between of the interaction it is important to reflect and discover. Reflection is a powerful tool that can be used to reinforce and improve learning. Reflection is a form of mental processing – like a form of thinking – which we use to fulfill a purpose or to achieve some anticipated outcome. It is applied to relatively complicated or unstructured ideas for which there is not an obvious solution and is largely based on the further

processing of knowledge and understanding and possibly emotions that we already possess (Moon, 1999). Group reflection is often missed; however, it is an extremely important part of helping students retain acquired learning, analyzing their performance on the task at hand, and establishing what they might do better in the next group situation. (Educators Virtual Mentor. 2006).

How to make courses so that most up-to-date information sources are used?
This issue is one of things that Internet enables. Looking for current information from the Internet is one of the great advantages and a significant advantage to traditional means of communicating information. Books, for example, contain information, which is approximately 2-4 years old, if not more. As discussed earlier, software business development on the other hand requires the most up-to-date information, and therefore **the inclusion of learning options that require the learners to use up-to-date information is essential**.

The purpose of this research project is to investigate student perceptions of the effectiveness of specific aspects of the eLearning delivery for the highly interactive and process oriented software business course. Like in O'Malley's research *(O'Malley*) perceived effectiveness was chosen because of:

(1) The difficulties of measuring learning (must have control and experimental group over time in controlled setting),
(2) Student perceptions might be more important than reality (as we know in the service industry decisions are many times based on perceptions) and
(3) Perceived learning will contribute to the knowledge of learning effectiveness.

A similar, but slightly modified approach was chosen for this research than in the O'Malley's research utilizing the Everett Rogers' model of diffusion of innovation (Rogers, 1995). His approach includes five stages in the innovation diffusion process: Knowledge, persuasion, decision, implementation and confirmation. This research concentrates on the first two: Knowledge and persuasion. Three constructs, prior conditions, characteristics of the decision-making unit and perceived characteristics of the innovation will be used. Like in O'Malley's research the modified constructs in this research are:

(1) Prior educational conditions
(2) Characteristics of students, and
(3) Perceived characteristics of eLearning.

It is the belief that these three constructs influence students' perceptions regarding the effectiveness of eLearning in this research setting. The student perception model is thus following:

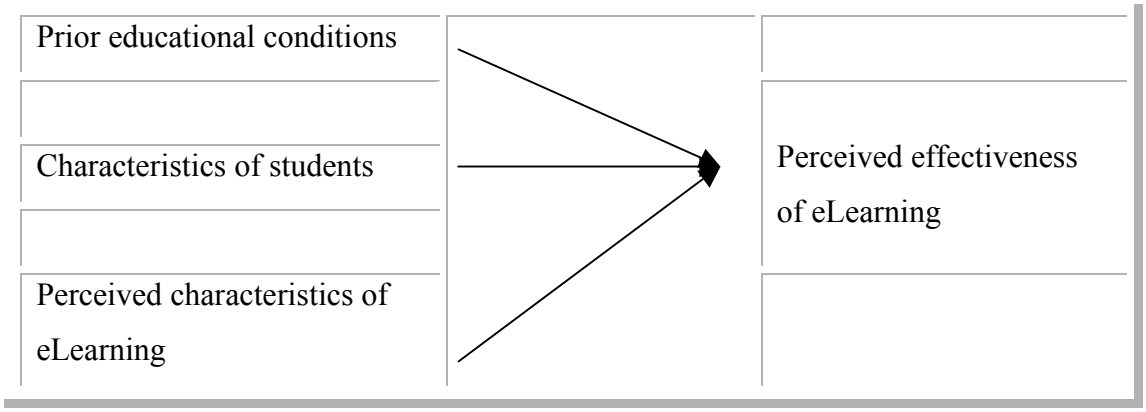


Figure 1. The student perception model.

O'Malley indicated that there are multiple facets for the constructs as described in the figure above for example as follows:

1. Educational conditions
   - Previous educational practice,
   - Student felt needs, and
   - Sociological changes.
2. Characteristics of the student
   - Facets include socioeconomic characteristics,
   - Personality variables, and
   - Communication behaviors.
3. Characteristics of eLearning
   - Relative advantage,
   - Student compatibility, and
   - Course compatibility.

4. Perceived effectiveness of eLearning
    - Grades and
    - Schedule.

As far as the **prior educational conditions** is concerned the list of detailed constructs for this research are:

- Field of the degree
- Time elapsed from last formal learning experience
- Experience with eLearning (Novice, advanced beginner, competent, proficient, expert)
- Comprehension of the basic terms for the course in question prior entering the class.
- The attitude of the student towards eLearning prior entering the class.

As far as the **characteristics of the student** is concerned the list of detailed constructs for this research are:

- Age
- Marital status
- Sex
- Nature of the practical experience in software business (technical, business, N.A.)
- Length of experience in software business.
- Ambiguity tolerance of the student.
- The learning style of the student and its suitability to eLearning.
- The learning activity and initiative of the student.
- Time management skills of the student.
- Level of motivation of the student.

As far as the **characteristics of eLearning** is concerned the list of detailed constructs for this research are:

- The enablement of the pace of eLearning in order to accomplish learning more quickly (no time/place limitations).
- Using the eLearning mode improves learning.
- The use of eLearning makes learning easier.

- Using eLearning improves productivity in learning.
- The suitability of the background and education of the student to eLearning.
- The suitability of the software business course for the eLearning mode.
- The contribution of collaboration with the fellow students towards learning.
- The contribution of physical meetings towards learning.
- The facilitation of eLearning to the use of most up-to-date information and data in the course.
- The necessity and benefit of synchronized meetings (i.e. the use of chat and conferencing).
- The necessity and benefit of asynchronous meetings (i.e. E-Mail, blogs, threaded discussions).
- The responsibility of the student in the eLearning mode in comparison to traditional mode of teaching delivery.
- The suitability of the eLearning in comparison to the traditional delivery mode to the individual needs of the student?

As far as the **perceived effectiveness** is concerned the list of detailed constructs for this research are:

- Most participants believed that eLearning is more effective than traditional methodologies.
- The preference of the student as regards to the learning modes.
- The preference of the student of eLearning courses to traditional courses.
- The amount of learning in an eLearning course and in a traditional course.
- The possibility to get the same grade in an eLearning course and in a traditional course.
- The ability eLearning mode to help the critical thinking skills in the course.

4 RESEARCH METHODOLOGY, SELECTION OF RESEARCH METHOD AND QUESTIONNAIRE DEVELOPMENT

Qualitative research methodology is suitable when (Syrjälä et al., 1994):

1. When one is interested in the detailed constructs of occasions and not so much in the detailed distribution of them.
2. When one is interested in the construct meanings of participants in specific occasions.
3. When one is interested in researching natural situations, which cannot be organized as a test or when it is not possible to control all variables involved.
4. When one wants to get specific information about cause-effect relationships related to specific occasions, which cannot be studied with a test.

It is expected that the number of participants in the first course will be quite limited, maybe in the region 15-25 participants. Therefore the use of a full quantitative research method is not possible. Furthermore it is not possible to organize any kind of tests for this research.

As far as the selection of the research method is concerned, there are four alternatives (Metsämuuronen, 2000):

1. Observation
2. Text analysis
3. Interview
4. Content analysis

Out of these, interview is the natural selection as a research method for this research. This will happen using open-ended questions based questionnaire for selected individuals or groups. The acquisition of data will happen using a case research method. It is important to note here that the issue in this research is *how the software business course should be conducted* and NOT how software business should be conducted.

The questionnaire for this research can be found in Appendix A.

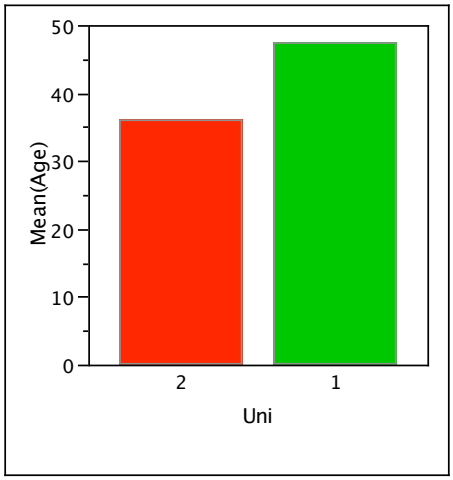
5. DATA ANALYSIS

The qualitative research was conducted using an Internet based questionnaire in the middle of the Software Business class during Fall 2006. The participants were working adults at Tampere Polytechnic University participating into the Upper Level Polytechnic University degree. For comparative purposes some of the participants in the eLearning Professional class at Open University also responded to the questionnaire.

There were altogether 36 responses out of which 13 came from Open University eLearning Professional participants and 23 from the Tampere Polytechnic University Software Professional course participants. As expected the number of responses is so low that a proper statistical analysis is not warranted. The basic distributions of the responses to the research questions will be presented in the following and preliminary comments will also made. The results were analyzed using JMP 1-2-3 statistical software package provided by SAS[6].

5.1. BACKGROUND DATA

The average age of all respondents was 40,1 years, 36 years among the students in the Software Business course at Tampere Polytechnic University and 47,4 years among the students in the eLearning Professional course at Open University.

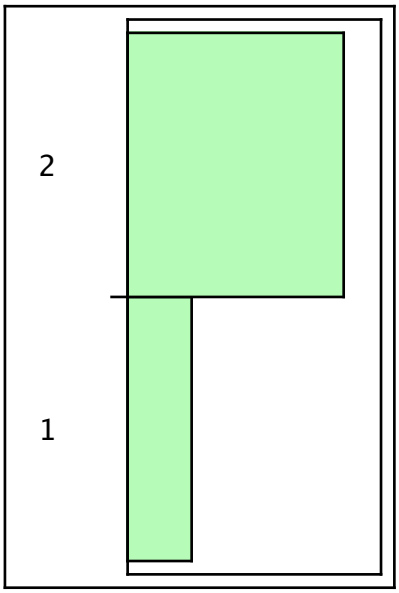


[6] Please note in the forthcoming presentation of the results that if there are no responses to an alternative in a question, that particular column will not be shown.

Figure 2. Average age of the respondents (Open University=1, Tampere Polytechnic University=2).

Gender distribution was following among the respondents in the participating universities. In both universities the number of female respondents was significantly larger than the number of male respondents.

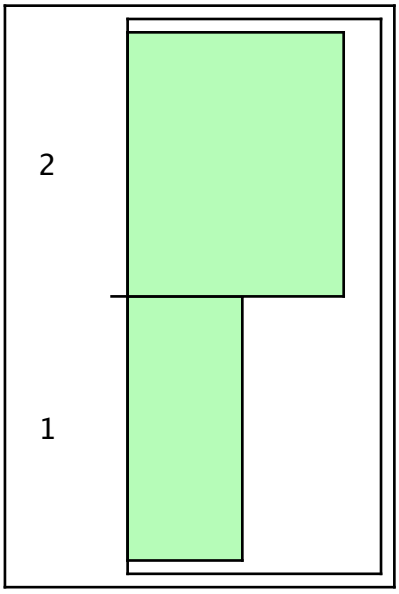
Open University



Frequencies

Level	Count	Prob
1	3	0,23077
2	10	0,76923
Total	13	1,00000

Tampere Polytechnic University



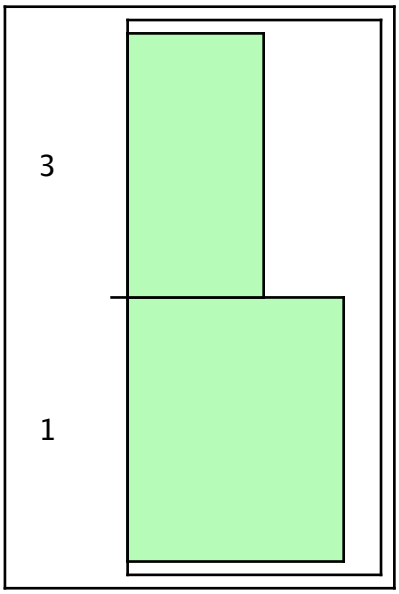
Frequencies

Level	Count	Prob
1	8	0,34783
2	15	0,65217
Total	23	1,00000

Figure 3. Gender of the respondents (Male=1, Female=2).

The marital status of the respondents can been seen from the following figure.

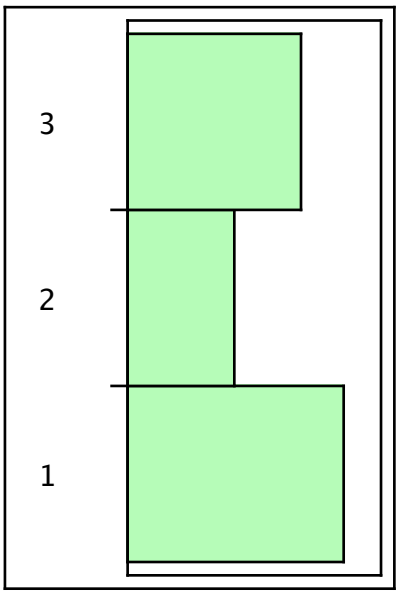
Open University



Frequencies

Level	Count	Prob
1	8	0,61538
3	5	0,38462
Total	13	1,00000

Tampere Polytechnic University



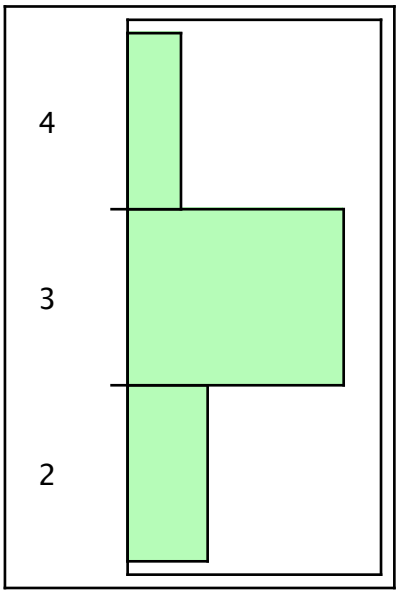
Frequencies

Level	Count	Prob
1	10	0,43478
2	5	0,21739
3	8	0,34783
Total	23	1,00000

Figure 4. Marital status (1=married, 2=companionate marriage, 3= single).

The nature of the work experience of the respondents can been seen from the following figure. Most of the participants in the Open University course have a teaching background while most of the students in the Tampere Polytechnic University course had either a business or technical background.

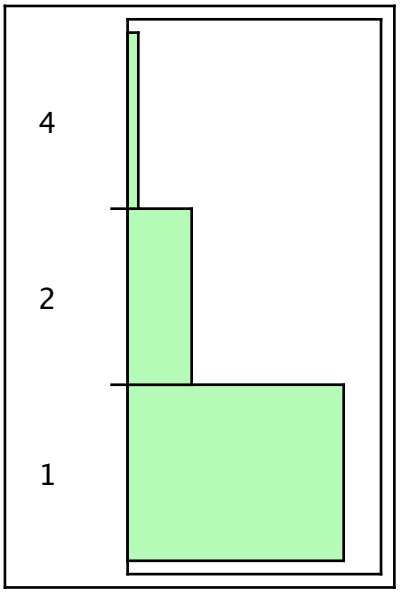
Open University



Frequencies

Level	Count	Prob
2	3	0,23077
3	8	0,61538
4	2	0,15385
Total	13	1,00000

Tampere Polytechnic University



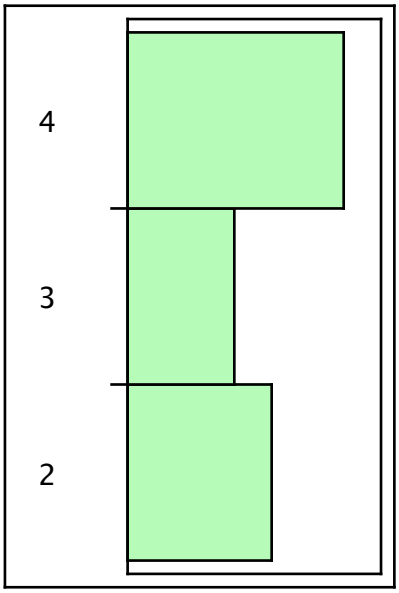
Frequencies

Level	Count	Prob
1	17	0,73913
2	5	0,21739
4	1	0,04348
Total	23	1,00000

Figure 5. Nature of the work experience (1=technical, 2=business, 3=teaching, 4=other).

The length of the work experience of the respondents can been seen from the following figure. Most of the respondents had rather lengthy work experience in both institutions.

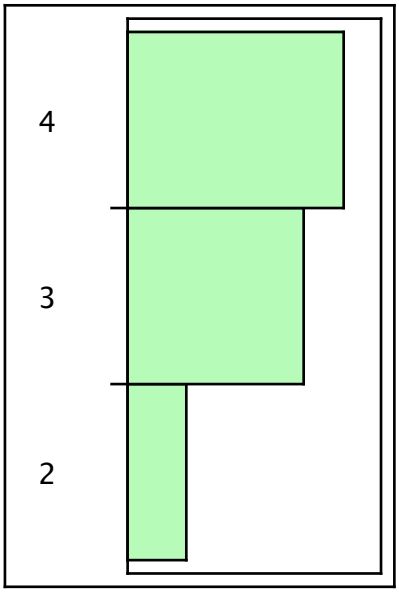
Open University



Frequencies

Level	Count	Prob
2	4	0,30769
3	3	0,23077
4	6	0,46154
Total	13	1,00000

Tampere Polytechnic University



Frequencies

Level	Count	Prob
2	3	0,13043
3	9	0,39130
4	11	0,47826
Total	23	1,00000

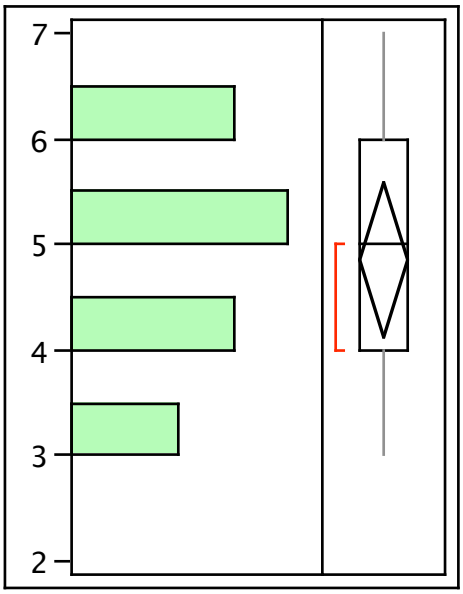
Figure 6. Nature of the length experience (1= none, 2= 1-4 years, 3= 5-9 years, 4= more than 10 years).

5.2. OTHER CHARACTERISTICS OF THE RESPONDENTS

Question: Uncertainty tolerance

Both groups indicated having a reasonably high uncertainty tolerance, which was quite similar in both groups.

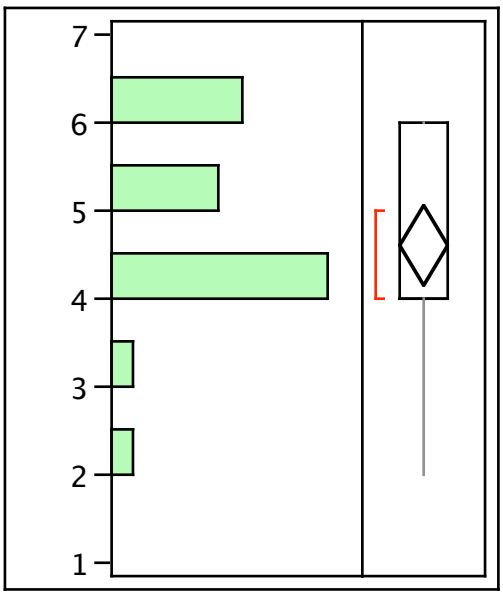
Open University



Moments

Mean	4,8461538
Std Dev	1,2142318
Std Err Mean	0,3367673
Upper 95% Mean	5,5799068
Lower 95% Mean	4,1124009
N	13

Tampere Polytechnic University



Moments

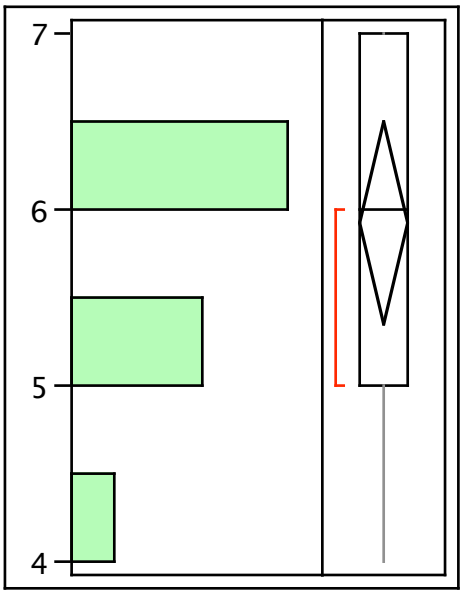
Mean	4,6086957
Std Dev	1,0761518
Std Err Mean	0,2243932
Upper 95% Mean	5,0740586
Lower 95% Mean	4,1433327
N	23

Figure 7. Uncertainty tolerance (1=low, 7= high).

Question: Learning style suitability to eLearning

Respondents in both teams felt that their learning styles are relatively suitable to eLearning. There appears to be a significant difference between these two groups. When comparing the means, it appeared that the OU (Open University) respondents thought that their learning styles were much more suitable to eLearning.

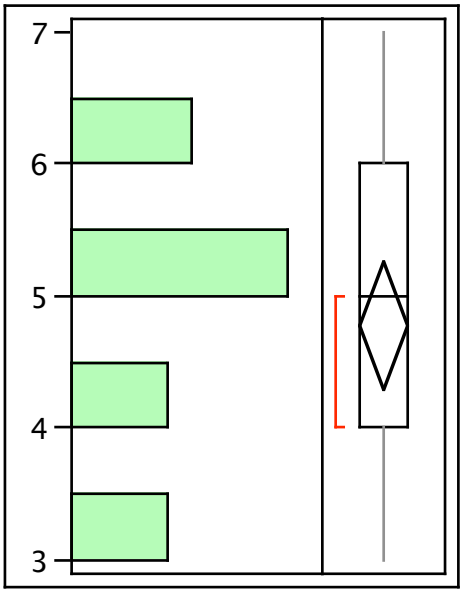
Open University



Moments

Mean	5,9230769
Std Dev	0,9540736
Std Err Mean	0,2646124
Upper 95% Mean	6,4996178
Lower 95% Mean	5,346536
N	13

Tampere Polytechnic University



Moments

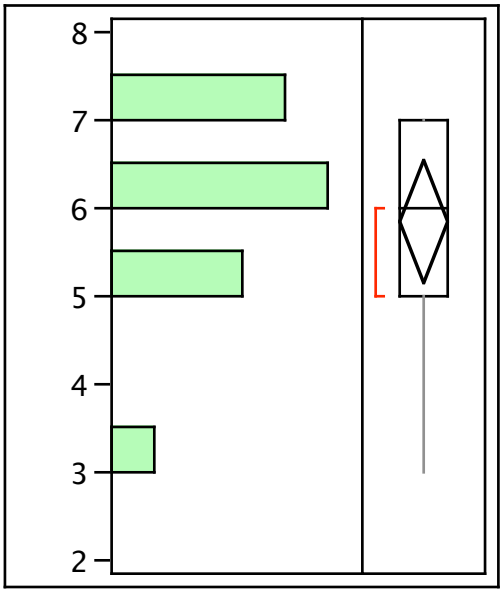
Mean	4,7826087
Std Dev	1,126399
Std Err Mean	0,2348704
Upper 95% Mean	5,2697001
Lower 95% Mean	4,2955172
N	23

Figure 8. Suitability of learning style to eLearning (1=low, 7=high).

Question: Active learner and self-starter

Respondents in both teams felt that they are active learners and self-starters. There appears to be a significant difference between these two groups. When comparing the means, it appeared that the OU respondents thought that they were even more active learners and self-starters that the TPU respondents.

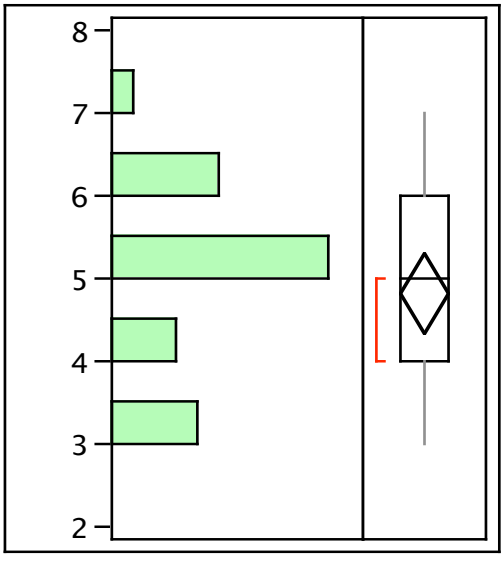
Open University



Moments

Mean	5,8461538
Std Dev	1,1435437
Std Err Mean	0,317162
Upper 95% Mean	6,5371904
Lower 95% Mean	5,1551173
N	13

Tampere Polytechnic University



Moments

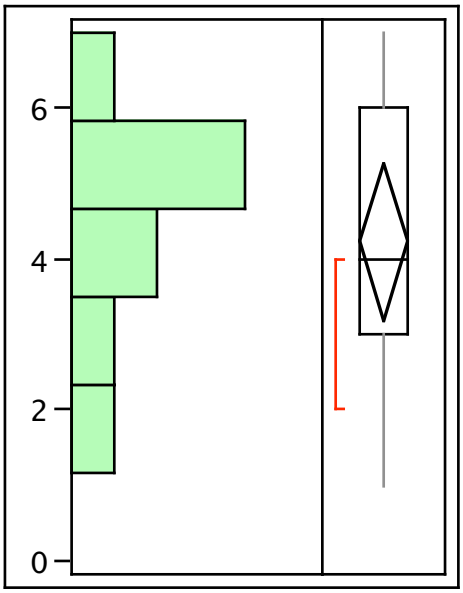
Mean	4,826087
Std Dev	1,1140497
Std Err Mean	0,2322954
Upper 95% Mean	5,3078382
Lower 95% Mean	4,3443357
N	23

Figure 9. Active learner and self-starter (1=low, 7= high).

Question: Time management skills of the respondent

Time management skill is in both groups appeared to be quite similar, but only slightly above the average. Clearly both groups could benefit from better time management skills. The interesting point here is that OU provides time management related resources at the web site. The question of course is that do the course participants take advantage of these resources.

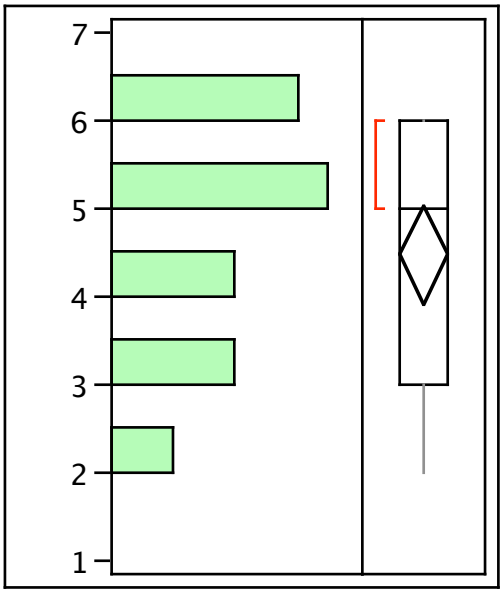
Open University



Moments

Mean	4,2307692
Std Dev	1,739437
Std Err Mean	0,482433
Upper 95% Mean	5,2819005
Lower 95% Mean	3,179638
N	13

Tampere Polytechnic University



Moments

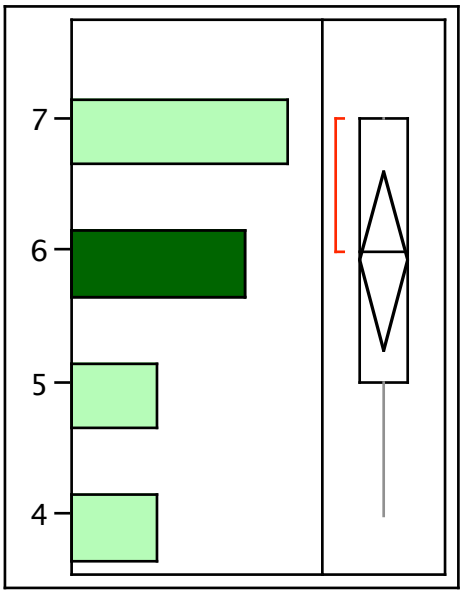
Mean	4,4782609
Std Dev	1,3097385
Std Err Mean	0,2730994
Upper 95% Mean	5,0446343
Lower 95% Mean	3,9118875
N	23

Figure 10. Time management skills (1=low, 7= high).

Question: Motivational level of the respondent

Motivational level appears to be similar in both groups and at a relatively high level. In spite of this many participants in both courses quit the course.

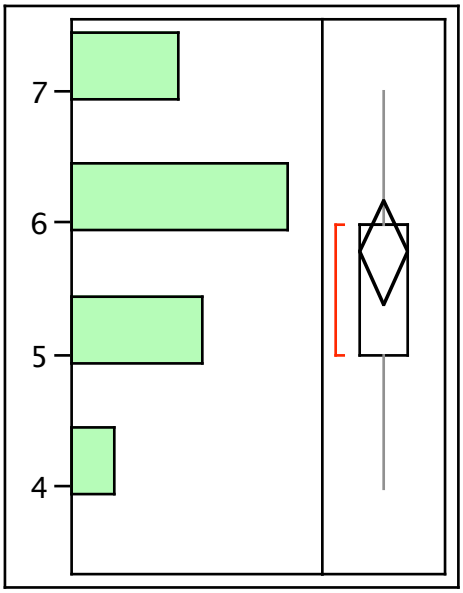
Open University



Moments

Mean	5,9230769
Std Dev	1,1151636
Std Err Mean	0,3092907
Upper 95% Mean	6,5969635
Lower 95% Mean	5,2491903
N	13

Tampere Polytechnic University



Moments

Mean	5,7826087
Std Dev	0,9023465
Std Err Mean	0,1881523
Upper 95% Mean	6,1728126
Lower 95% Mean	5,3924048
N	23

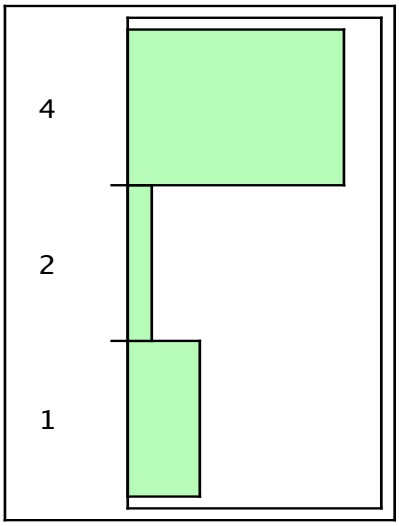
Figure 11. Level of motivation (1=low, 7= high).

5.3. PRIOR EDUCATIONAL CONDITIONS OF RESPONDENTS

Question: Field of degree of the respondent before entering the course

Field of degree reflects the practical experience, which was an earlier question in the research project.

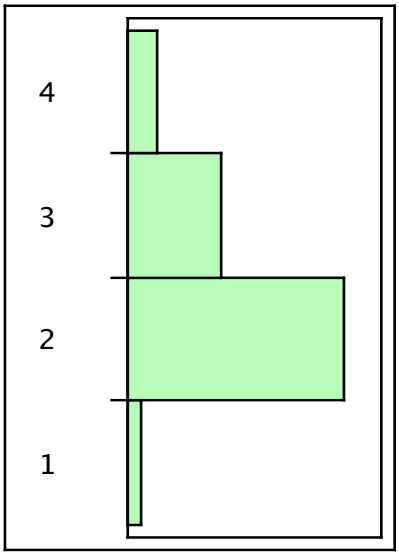
Open University



Frequencies

Level	Count	Prob
1	3	0,23077
2	1	0,07692
4	9	0,69231
Total	13	1,00000

Tampere Polytechnic University



Frequencies

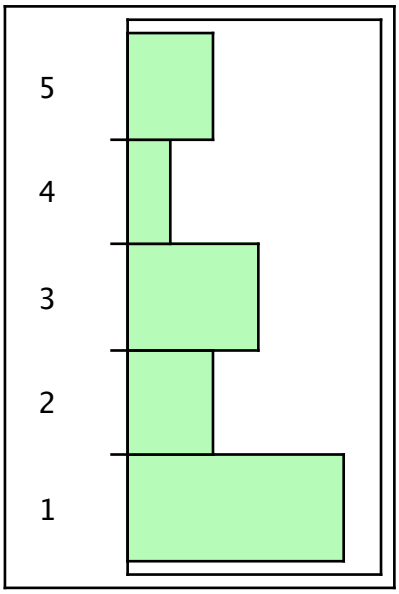
Level	Count	Prob
1	1	0,04348
2	14	0,60870
3	6	0,26087
4	2	0,08696
Total	23	1,00000

Figure 12. Field of degree before entering the course (1= business, 2= computer science, 3=information systems, 4=other).

Question: Time elapsed from the last degree

Even though the average age of the OU respondents is some 10 years more that TPU respondents, the time elapsed from the last degree appears to be somewhat shorter.

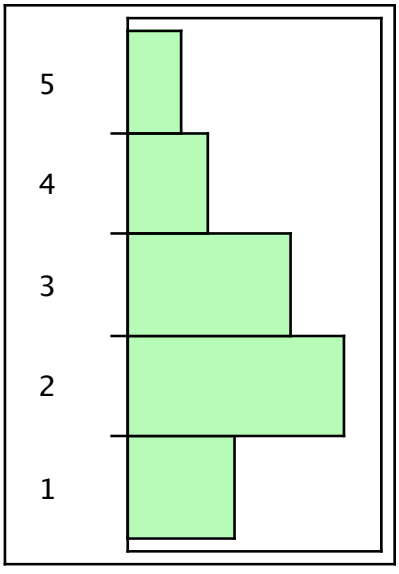
Open University



Frequencies

Level	Count	Prob
1	5	0,38462
2	2	0,15385
3	3	0,23077
4	1	0,07692
5	2	0,15385
Total	13	1,00000

Tampere Polytechnic University



Frequencies

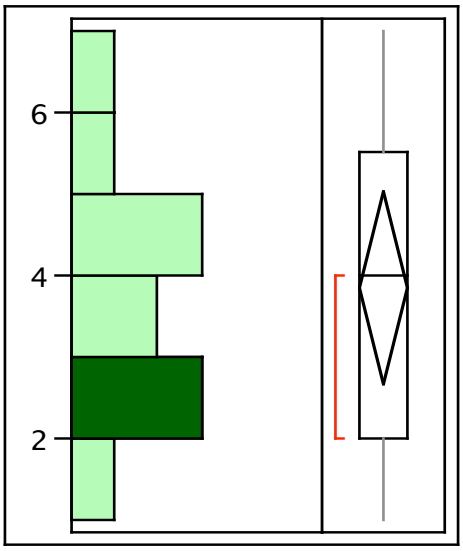
Level	Count	Prob
1	4	0,17391
2	8	0,34783
3	6	0,26087
4	3	0,13043
5	2	0,08696
Total	23	1,00000

Figure 13. Time elapsed from the last degree (1= 1 year, 2= 2-3 years, 3= 4-5 years, 4= 6-7 years, 5= more than 8 years).

Question: Respondents' experience with eLearning

It is no surprise that the OU students have more experience with eLearning since OU is based on the distance-learning mode. One would have expected, however, that the OU students would have been even more experienced. The sample size of course is quite small.

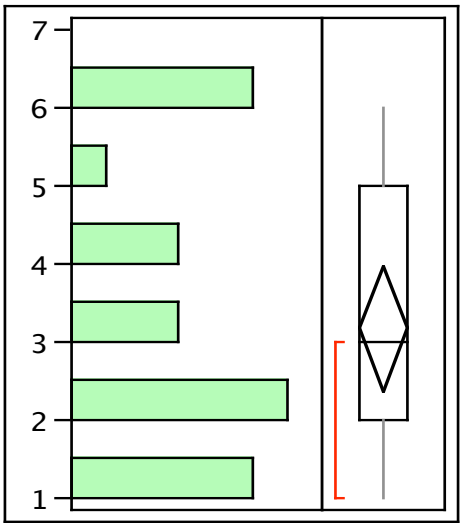
Open University



Moments

Mean	3,8461538
Std Dev	1,9513309
Std Err Mean	0,5412018
Upper 95% Mean	5,0253313
Lower 95% Mean	2,6669764
N	13

Tampere Polytechnic University



Moments

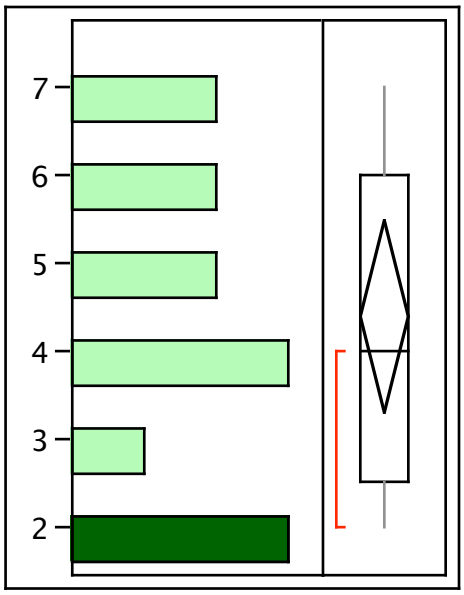
Mean	3,173913
Std Dev	1,8745223
Std Err Mean	0,3908649
Upper 95% Mean	3,9845173
Lower 95% Mean	2,3633088
N	23

Figure 14. Experience with eLearning (1=poor, 7=excellent).

Question: Respondent's comprehension of basic terms in the subject matter

The responses to the comprehension of basic terms appeared to be significantly different between the two groups with higher mean among the OU respondents.

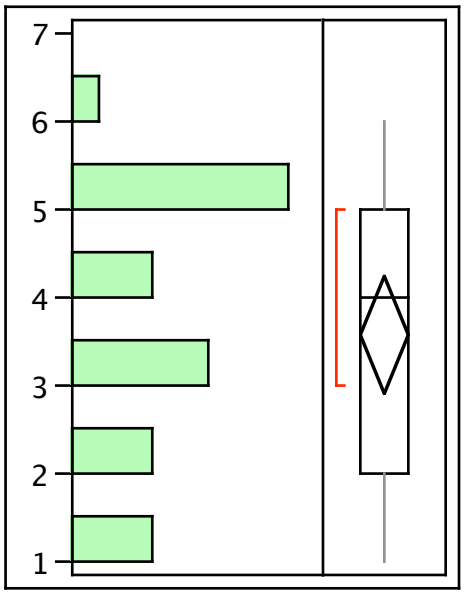
Open University



Moments

Mean	4,3846154
Std Dev	1,8045526
Std Err Mean	0,5004929
Upper 95% Mean	5,4750956
Lower 95% Mean	3,2941351
N	13

Tampere Polytechnic University



Moments

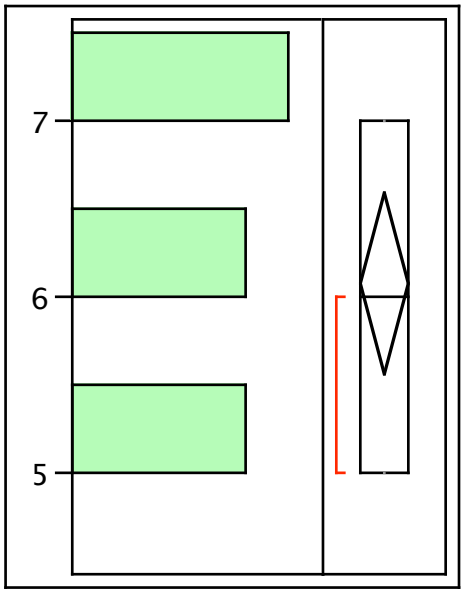
Mean	3,5652174
Std Dev	1,5322618
Std Err Mean	0,3194987
Upper 95% Mean	4,2278171
Lower 95% Mean	2,9026177
N	23

Figure 15. Comprehension of basic terms before entering the class (1=poor, 7=excellent).

Question: Respondents' attitude towards eLearning prior entering the course

The attitude to eLearning appeared to be significantly better among the OU respondents with both groups at a reasonably high level.

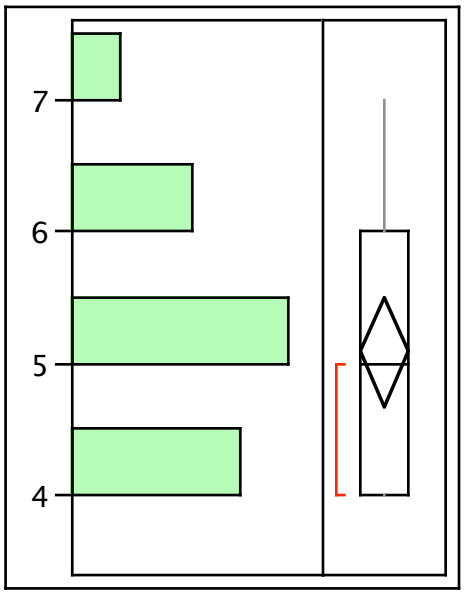
Open University



Moments

Mean	6,0769231
Std Dev	0,8623165
Std Err Mean	0,2391636
Upper 95% Mean	6,5980157
Lower 95% Mean	5,5558304
N	13

Tampere Polytechnic University



Moments

Mean	5,0869565
Std Dev	0,949308
Std Err Mean	0,1979444
Upper 95% Mean	5,4974681
Lower 95% Mean	4,6764449
N	23

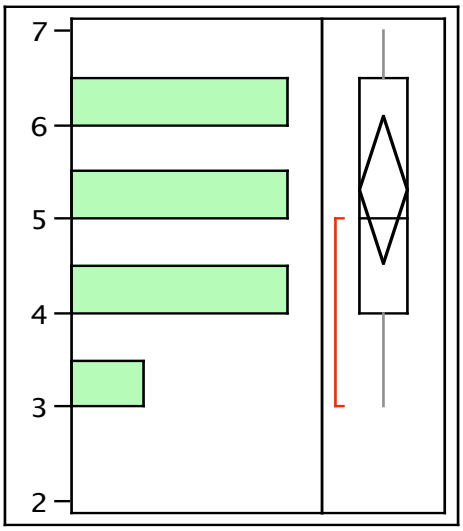
Figure 16. Attitude towards eLearning before entering the class (1=poor, 7=excellent).

5.4. CHARACTERISTICS OF eLEARNING

Question: eLearning enables faster learning

Both groups thought that the eLearning enables faster learning, but again there appeared to be a significant difference between the two groups with the OU respondents thinking that eLearning enabled even faster learning than TPU respondents. This could be due to the fact that the OU respondents had significantly more experience with eLearning.

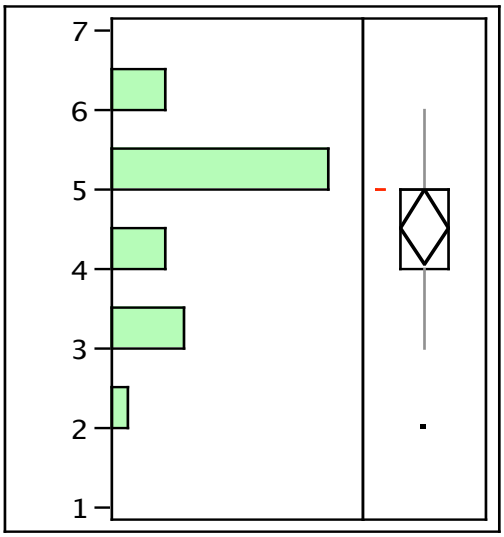
Open University



Moments

Mean	5,3076923
Std Dev	1,315587
Std Err Mean	0,3648782
Upper 95% Mean	6,1026936
Lower 95% Mean	4,512691
N	13

Tampere Polytechnic University



Moments

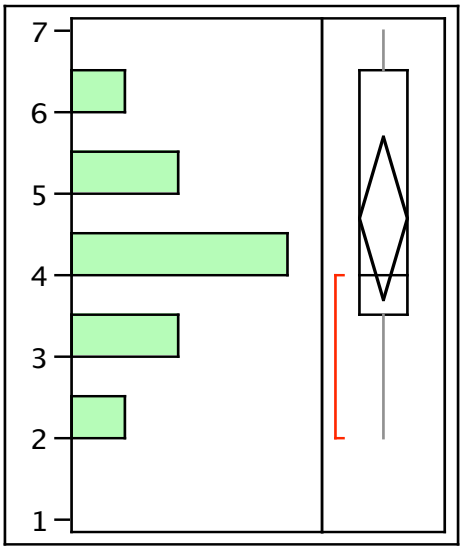
Mean	4,5217391
Std Dev	1,0816471
Std Err Mean	0,225539
Upper 95% Mean	4,9894784
Lower 95% Mean	4,0539998
N	23

Figure 17. eLearning enables faster learning (1=completely disagree, 7=completely agree).

Question: eLearning improves learning

Both groups thought that the eLearning improves learning, but there appeared to be some difference between the two groups with the OU respondents thinking that eLearning improved learning more than TPU respondents. Again this could be due to the fact that the OU respondents had significantly more experience with eLearning.

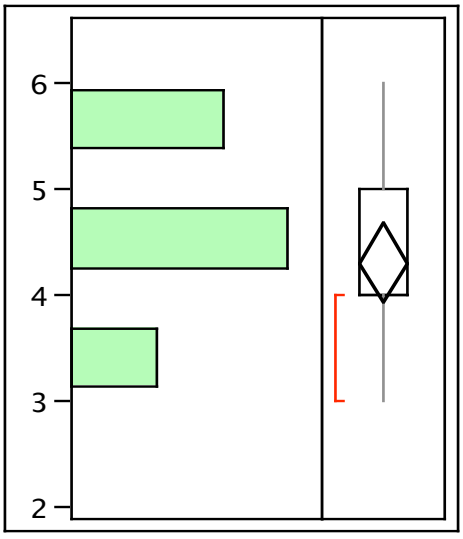
Open University



Moments

Mean	4,6923077
Std Dev	1,6525039
Std Err Mean	0,4583221
Upper 95% Mean	5,6909058
Lower 95% Mean	3,6937096
N	13

Tampere Polytechnic University



Moments

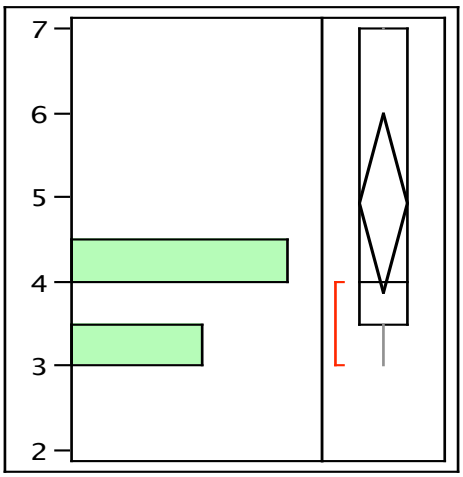
Mean	4,3043478
Std Dev	0,8756703
Std Err Mean	0,1825899
Upper 95% Mean	4,683016
Lower 95% Mean	3,9256796
N	23

Figure 18. eLearning improves learning (1=completely disagree, 7=completely agree).

Question: Learning easier in eLearning mode

Both groups thought that learning is easier in eLearning, but there appeared to be a significant difference between the two groups with the OU respondents thinking that learning is easier in eLearning more than TPU respondents. Again this could be due to the fact that the OU respondents had significantly more experience with eLearning.

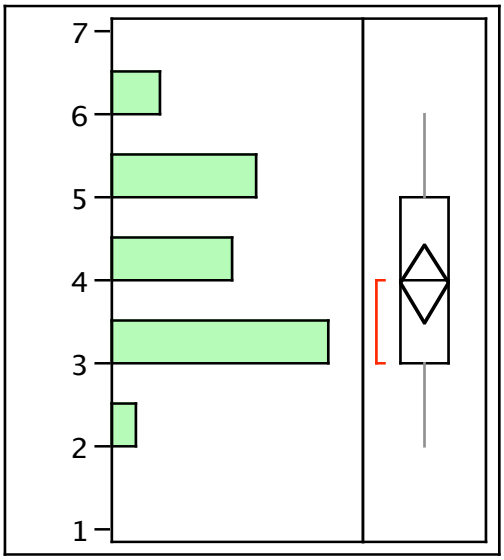
Open University



Moments

Mean	4,9230769
Std Dev	1,754116
Std Err Mean	0,4865043
Upper 95% Mean	5,9830786
Lower 95% Mean	3,8630752
N	13

Tampere Polytechnic University



Moments

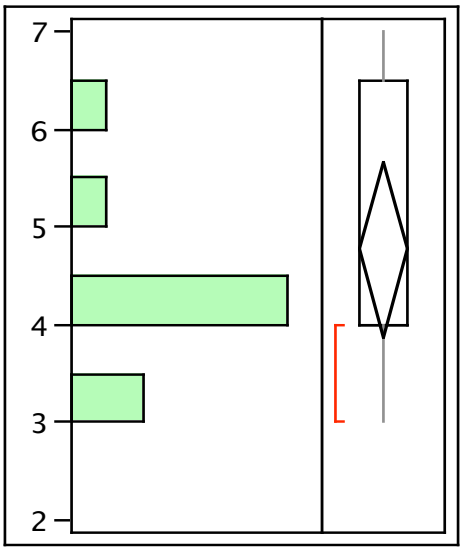
Mean	3,9565217
Std Dev	1,1069311
Std Err Mean	0,2308111
Upper 95% Mean	4,4351946
Lower 95% Mean	3,4778488
N	23

Figure 19. Learning easier in eLearning mode (1=completely disagree, 7=completely agree).

Question: eLearning improves productivity

The expectation here is that eLearning improves productivity due to the fact that eLearning does not depend on place and time. This was also the case based on the responses. But again, the OU respondents thought eLearning improves productivity even more than the TPU respondents.

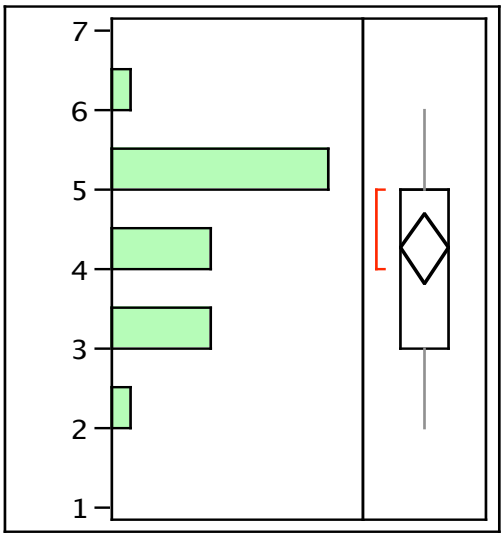
Open University



Moments

Mean	4,7692308
Std Dev	1,4806444
Std Err Mean	0,4106569
Upper 95% Mean	5,6639752
Lower 95% Mean	3,8744863
N	13

Tampere Polytechnic University



Moments

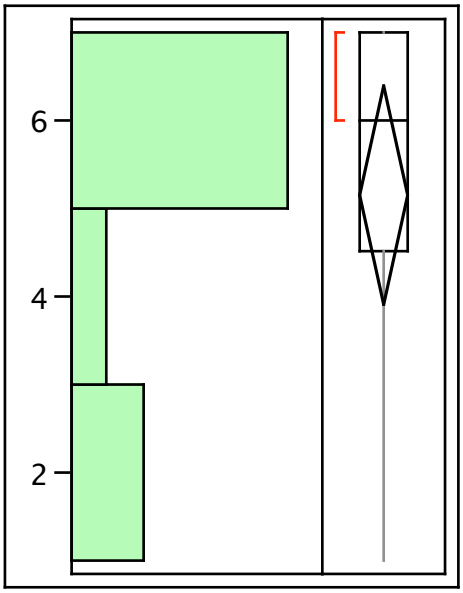
Mean	4,2608696
Std Dev	1,0098331
Std Err Mean	0,2105648
Upper 95% Mean	4,6975541
Lower 95% Mean	3,824185
N	23

Figure 20. eLearning improves productivity (1=completely disagree, 7=completely agree).

Question: Respondent's background suitability to eLearning

Both of the groups thought that their backgrounds were suitable to eLearning and there appeared not to be significant differences between the two groups.

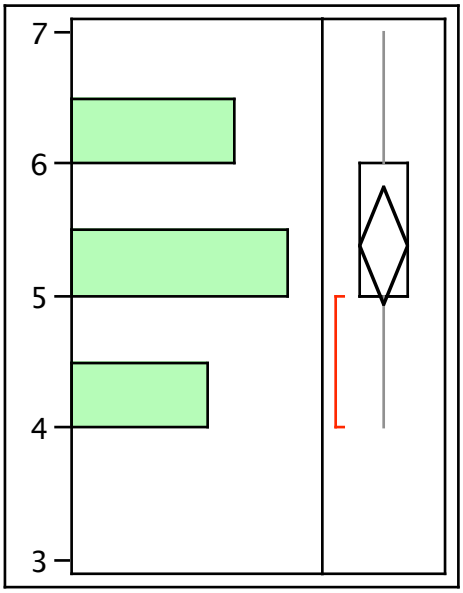
Open University



Moments

Mean	5,1538462
Std Dev	2,0754981
Std Err Mean	0,5756396
Upper 95% Mean	6,4080571
Lower 95% Mean	3,8996352
N	13

Tampere Polytechnic University



Moments

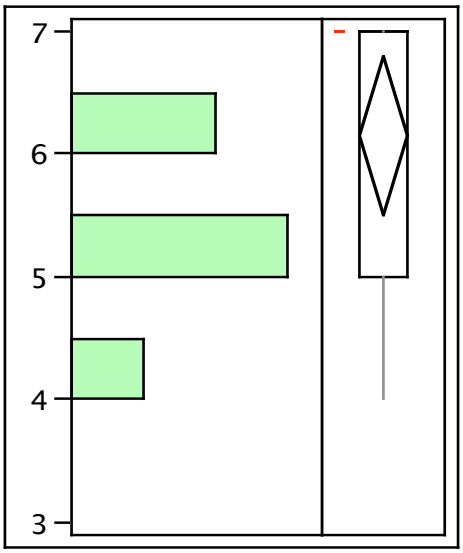
Mean	5,3913043
Std Dev	1,0330507
Std Err Mean	0,215406
Upper 95% Mean	5,838029
Lower 95% Mean	4,9445797
N	23

Figure 21. Background suitability to eLearning (1=completely disagree, 7=completely agree).

Question: Course suitability to eLearning

Both groups thought that their courses were suitable to eLearning. This was true in spite of the fact that both courses are process oriented and require a lot of interaction and reflection. Again there appeared to be a significant difference between the two groups so that the OU students were even more favorable as regards to the suitability of their course to eLearning.

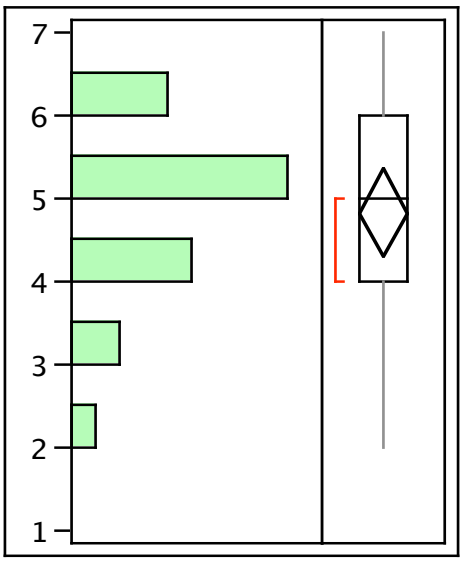
Open University



Moments

Mean	6,1538462
Std Dev	1,068188
Std Err Mean	0,2962621
Upper 95% Mean	6,7993457
Lower 95% Mean	5,5083466
N	13

Tampere Polytechnic University



Moments

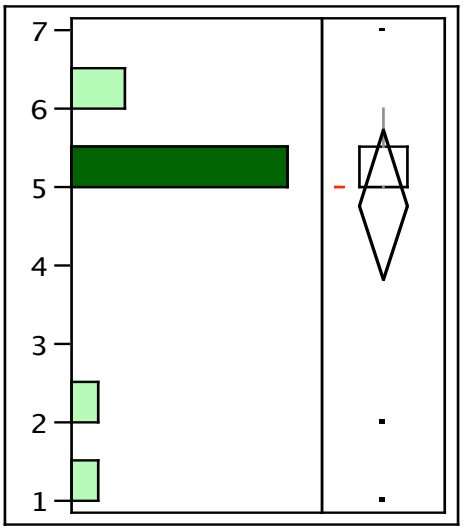
Mean	4,826087
Std Dev	1,2303796
Std Err Mean	0,2565519
Upper 95% Mean	5,358143
Lower 95% Mean	4,2940309
N	23

Figure 22. Course suitability to eLearning (1= completely disagree, 7=completely agree).

Question: Contribution of collaboration towards learning

Both courses include significant opportunities for collaboration online. The TPU degree program also enables collaboration in the off-line world. Both groups thought that collaboration between their fellow students contributed towards their learning. This of course is a two way street.

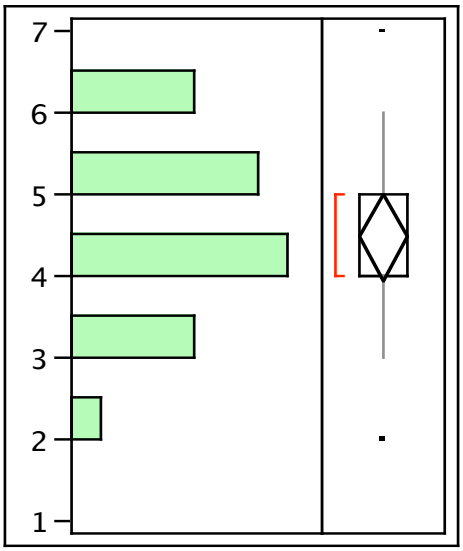
Open University



Moments

Mean	4,7692308
Std Dev	1,5892265
Std Err Mean	0,4407721
Upper 95% Mean	5,7295908
Lower 95% Mean	3,8088708
N	13

Tampere Polytechnic University



Moments

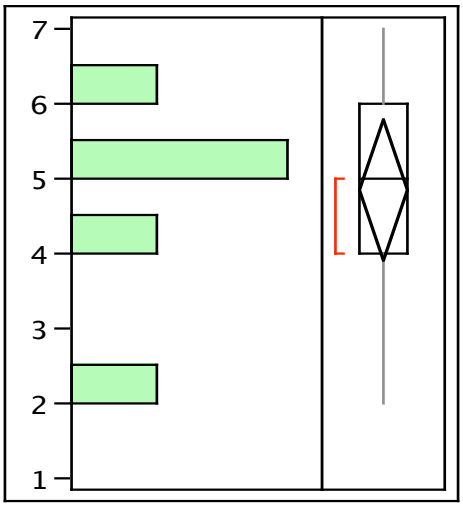
Mean	4,4782609
Std Dev	1,2383848
Std Err Mean	0,2582211
Upper 95% Mean	5,0137786
Lower 95% Mean	3,9427431
N	23

Figure 23. Contribution of collaboration towards learning (1=completely disagree, 7=completely agree).

Question: Contribution of physical meetings towards learning

Both courses did not facilitate physical meetings outside the virtual world. In spite of this fact, both groups felt that physical meetings would have contributed positively towards learning. The participants in the TPU course actually carried out physical meetings outside the course, and perhaps this explains their higher mean of responses.

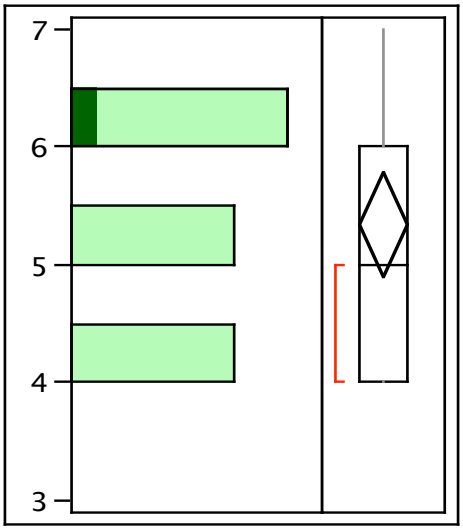
Open University



Moments

Mean	4,8461538
Std Dev	1,5730095
Std Err Mean	0,4362743
Upper 95% Mean	5,796714
Lower 95% Mean	3,8955937
N	13

Tampere Polytechnic University



Moments

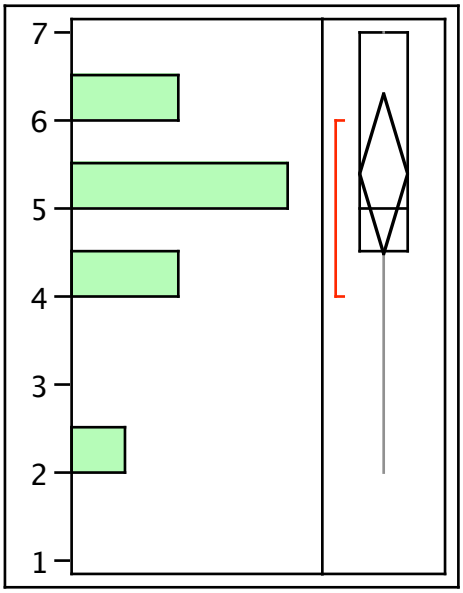
Mean	5,3478261
Std Dev	1,0272955
Std Err Mean	0,2142059
Upper 95% Mean	5,792062
Lower 95% Mean	4,9035902
N	23

Figure 24. Contribution of physical meetings towards learning (1=completely disagree, 7=completely agree).

Question: eLearning facilitates the use of up-to-date information and data

The expectation here is that eLearning should facilitate the use of up-to-date information and data. This was confirmed by the responses of both groups. No significant differences appear between the two groups.

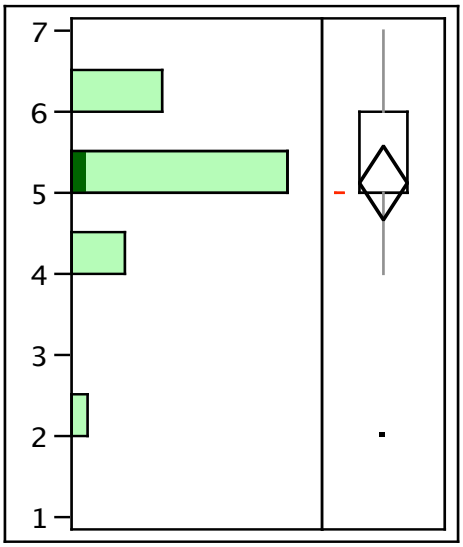
Open University



Moments

Mean	5,3846154
Std Dev	1,5021352
Std Err Mean	0,4166174
Upper 95% Mean	6,2923466
Lower 95% Mean	4,4768841
N	13

Tampere Polytechnic University



Moments

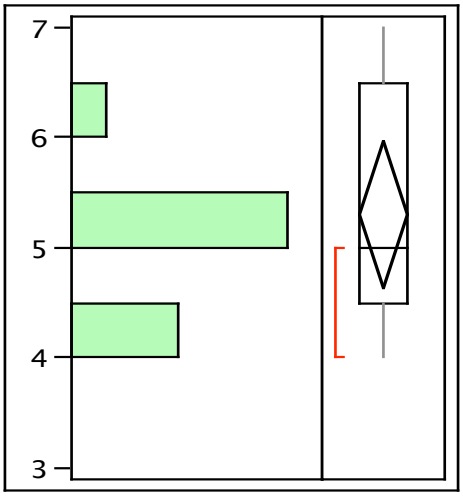
Mean	5,1304348
Std Dev	1,057628
Std Err Mean	0,2205307
Upper 95% Mean	5,5877874
Lower 95% Mean	4,6730821
N	23

Figure 25. eLearning facilitates the use of up-to-date information and data (1=completely disagree, 7=completely agree).

Question: Need for synchronized meetings in the course

One would have expected that the need for synchronized meetings would be quite small since organizing them, especially in the OU course because the students do come from allover the world, is probably quite difficult. This was not, however, confirmed by the respondents. Both favored synchronized meetings and even more so among the OU respondents.

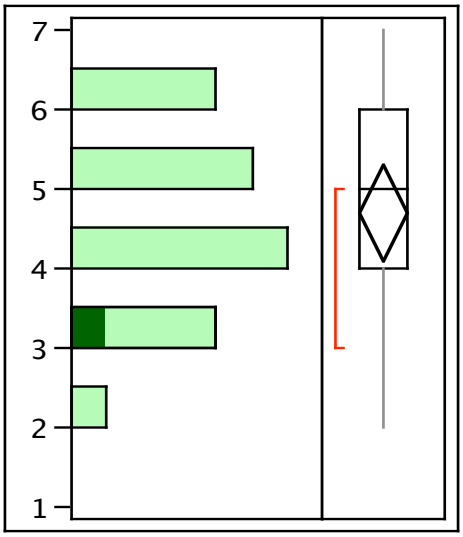
Open University



Moments

Mean	5,3076923
Std Dev	1,1094004
Std Err Mean	0,3076923
Upper 95% Mean	5,9780963
Lower 95% Mean	4,6372884
N	13

Tampere Polytechnic University



Moments

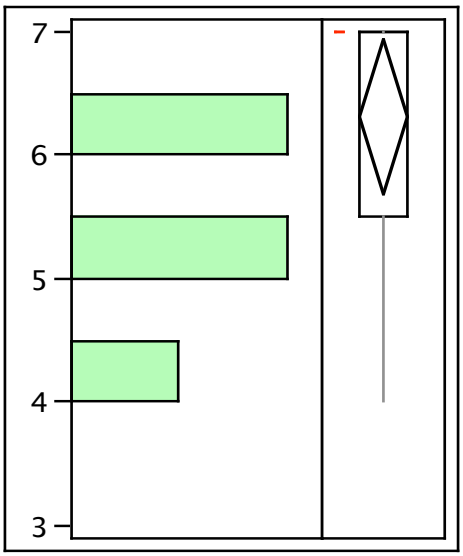
Mean	4,6956522
Std Dev	1,4281196
Std Err Mean	0,2977835
Upper 95% Mean	5,3132174
Lower 95% Mean	4,0780869
N	23

Figure 26. Need for synchronized meetings in the class (1=completely disagree, 7=completely agree).

Question: Need for asynchronous meetings in the course

Organizing asynchronous meetings during the course through the eLearning facilities is of course easier and both groups confirmed the need for asynchronous meetings, again significantly more by the OU respondents.

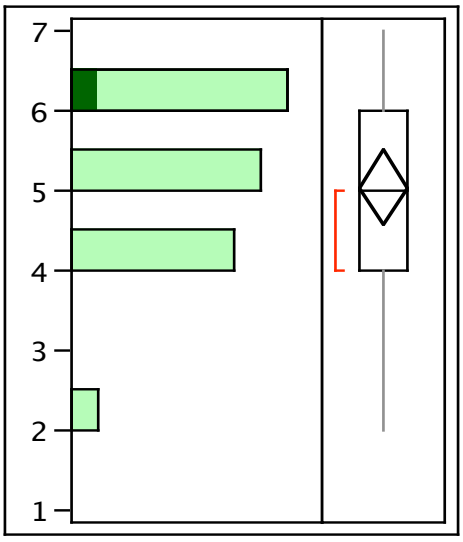
Open University



Moments

Mean	6,3076923
Std Dev	1,0315535
Std Err Mean	0,2861015
Upper 95% Mean	6,9310538
Lower 95% Mean	5,6843308
N	13

Tampere Polytechnic University



Moments

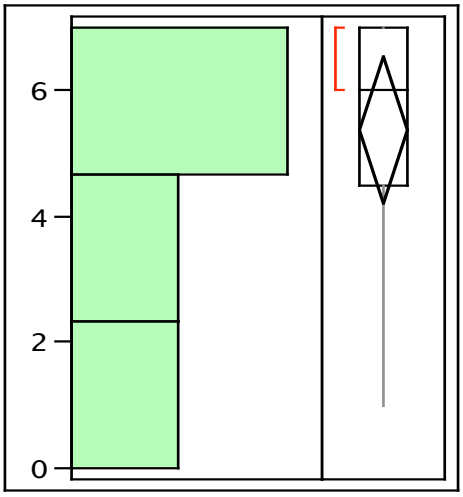
Mean	5,0434783
Std Dev	1,1069311
Std Err Mean	0,2308111
Upper 95% Mean	5,5221512
Lower 95% Mean	4,5648054
N	23

Figure 27. Need for asynchronous meetings in the class (1=completely disagree, 7=completely agree).

Question: The responsibility of the student is eLearning is greater than in traditional learning

The expectation was the responsibility was more on the students in the eLearning mode than in the traditional learning mode. Slightly surprisingly this was felt to be the case even more by the TPU respondents maybe due to the reason that eLearning was a newer experience for them.

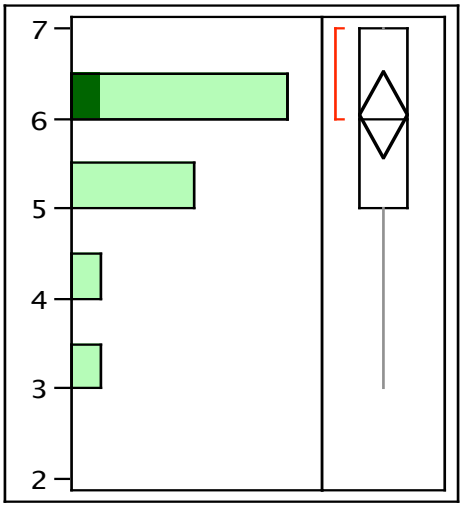
Open University



Moments

Mean	5,3846154
Std Dev	1,9381461
Std Err Mean	0,537545
Upper 95% Mean	6,5558253
Lower 95% Mean	4,2134054
N	13

Tampere Polytechnic University



Moments

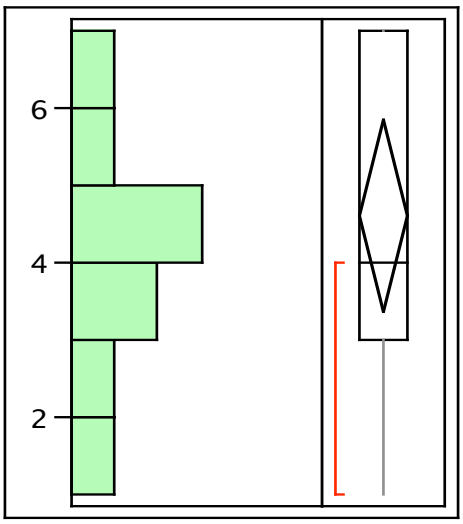
Mean	6,0434783
Std Dev	1,1069311
Std Err Mean	0,2308111
Upper 95% Mean	6,5221512
Lower 95% Mean	5,5648054
N	23

Figure 28. The responsibility of the student is eLearning is greater than in traditional learning (1= completely disagree, 7=completely agree).

Question: eLearning is more suitable to the individual needs than traditional learning

The expectation here was that eLearning was more suitable to the individual needs than the traditional learning especially so, because both groups are adult learners. This is due to the fact that eLearning is free from space and time. This was also confirmed by the responses of two groups. Slightly surprisingly this was felt to be the case even more by the TPU respondents

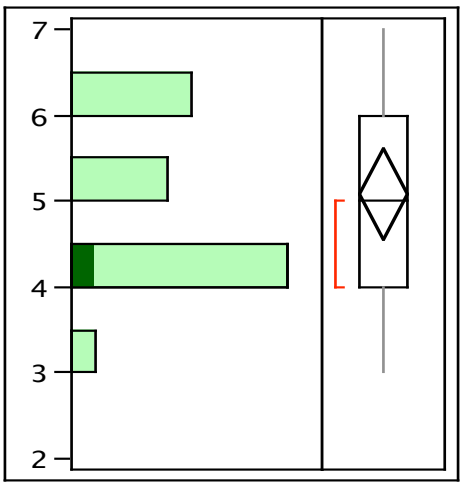
Open University



Moments

Mean	4,6153846
Std Dev	2,0631069
Std Err Mean	0,5722029
Upper 95% Mean	5,8621077
Lower 95% Mean	3,3686616
N	13

Tampere Polytechnic University



Moments

Mean	5,0869565
Std Dev	1,2399796
Std Err Mean	0,2585536
Upper 95% Mean	5,6231639
Lower 95% Mean	4,5507491
N	23

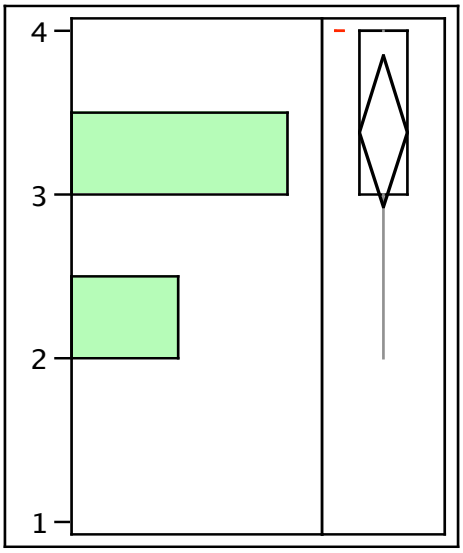
Figure 29. eLearning is more suitable to the individual needs than traditional learning (1=completely disagree, 7= completely agree).

5.5. PERCEIVED EFFECTIVENESS OF eLEARNING

Question: eLearning more effective than traditional learning

eLearning was not felt to be more effective than traditional learning. No significant differences between the two groups were discovered.

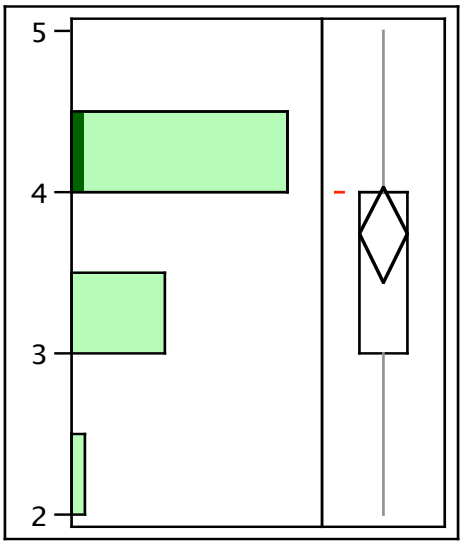
Open University



Moments

Mean	3,3846154
Std Dev	0,7679476
Std Err Mean	0,2129904
Upper 95% Mean	3,8486815
Lower 95% Mean	2,9205493
N	13

Tampere Polytechnic University



Moments

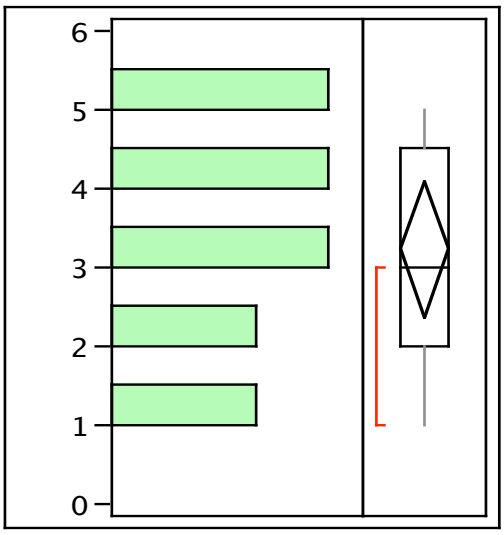
Mean	3,7391304
Std Dev	0,6887004
Std Err Mean	0,143604
Upper 95% Mean	4,0369468
Lower 95% Mean	3,441314
N	23

Figure 30. Participants perceptions regarding the effectiveness of eLearning vs. traditional learning (1=completely disagree, 7= completely agree).

Question: Learning is better in the traditional mode if both modes are used

The responses were for the first time divided to this question with the OU respondents slightly disagreeing with the statement and the TPU students slightly agreeing.

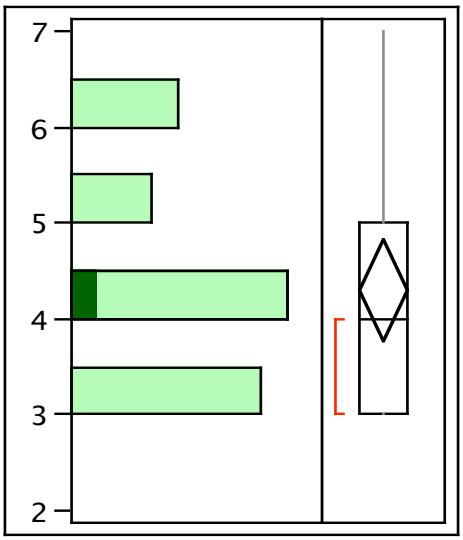
Open University



Moments

Mean	3,2307692
Std Dev	1,4232502
Std Err Mean	0,3947386
Upper 95% Mean	4,0908307
Lower 95% Mean	2,3707078
N	13

Tampere Polytechnic University



Moments

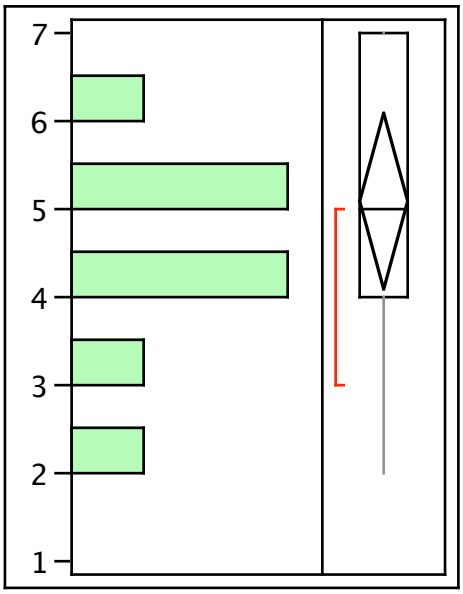
Mean	4,3043478
Std Dev	1,222322
Std Err Mean	0,2548718
Upper 95% Mean	4,8329195
Lower 95% Mean	3,7757761
N	23

Figure 31. Learning is better in the traditional mode if both modes are used (1=completely disagree, 7=completely agree).

Question: Preference of eLearning to traditional learning

Both groups preferred eLearning to traditional learning with OU students being even more favorable than TPU students.

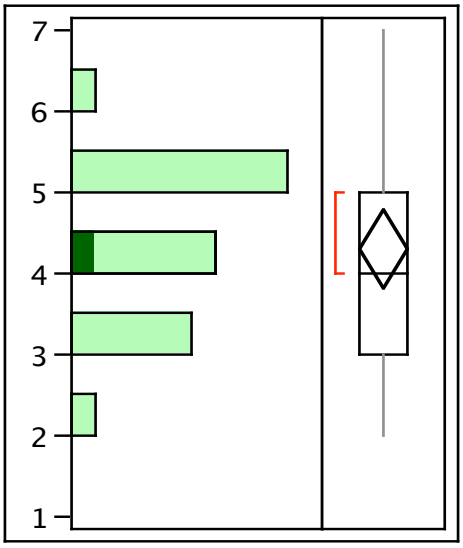
Open University



Moments

Mean	5,0769231
Std Dev	1,6563785
Std Err Mean	0,4593967
Upper 95% Mean	6,0778626
Lower 95% Mean	4,0759836
N	13

Tampere Polytechnic University



Moments

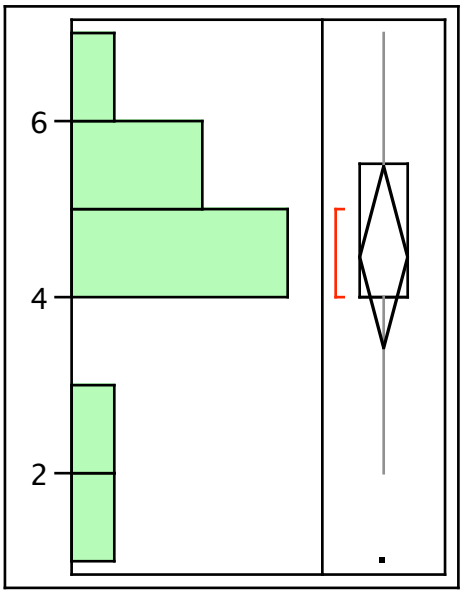
Mean	4,3043478
Std Dev	1,1455361
Std Err Mean	0,2388608
Upper 95% Mean	4,7997148
Lower 95% Mean	3,8089809
N	23

Figure 32. Preference of eLearning to traditional learning (1=completely disagree, 7=completely agree).

Question: Learning more with eLearning

Both groups were quite indifferent in this question between eLearning and traditional learning.

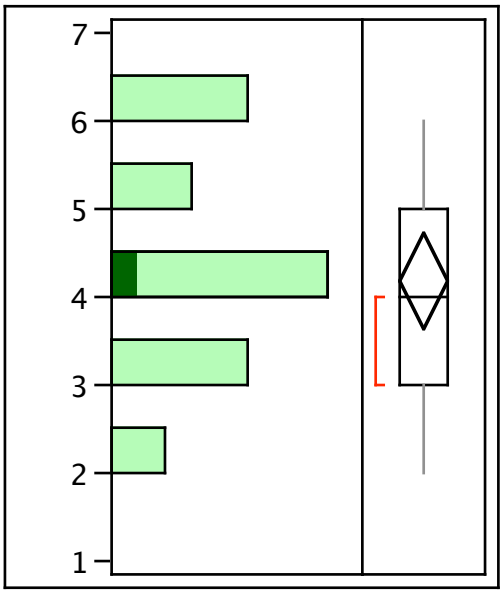
Open University



Moments

Mean	4,4615385
Std Dev	1,7134461
Std Err Mean	0,4752244
Upper 95% Mean	5,4969636
Lower 95% Mean	3,4261134
N	13

Tampere Polytechnic University



Moments

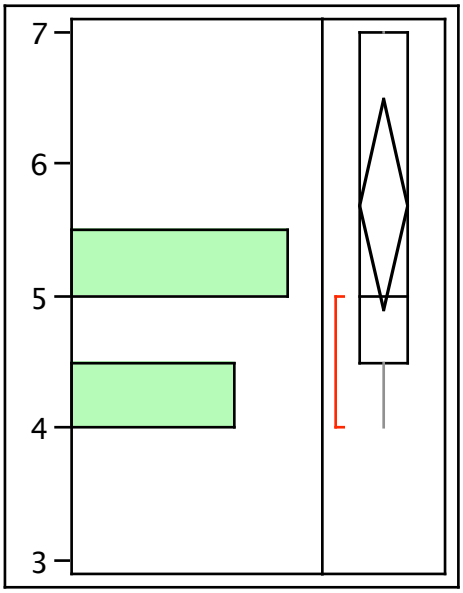
Mean	4,173913
Std Dev	1,2667845
Std Err Mean	0,2641428
Upper 95% Mean	4,7217118
Lower 95% Mean	3,6261143
N	23

Figure 33. Learning more with eLearning (1=completely disagree, 7= completely agree).

Question: Same grading in both modes

The OU respondents were quite agreeable to the similarity of the grading. Somewhat surprisingly the TPU students were quite indifferent in this question. The grading principles are perhaps somewhat clearer in the OU course than in the TPU course.

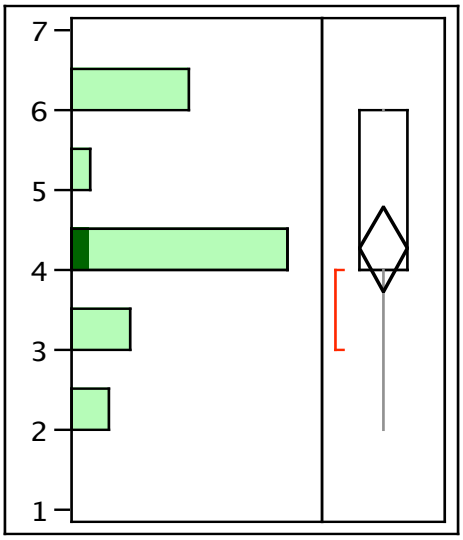
Open University



Moments

Mean	5,6923077
Std Dev	1,315587
Std Err Mean	0,3648782
Upper 95% Mean	6,487309
Lower 95% Mean	4,8973064
N	13

Tampere Polytechnic University



Moments

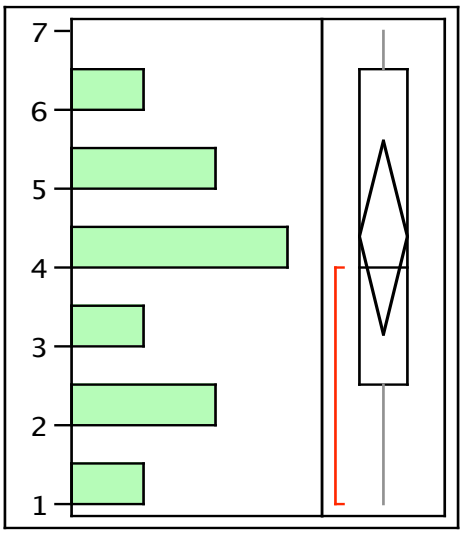
Mean	4,2608696
Std Dev	1,2510865
Std Err Mean	0,2608696
Upper 95% Mean	4,8018799
Lower 95% Mean	3,7198592
N	23

Figure 34. Same grading in both modes (1=completely disagree, 7=completely agree).

Question: eLearning improved critical thinking skills

One would have expected that both courses would improve critical thinking skills since both course include significant reflective elements; especially in the OU course. This was not, however, confirmed by the responses.

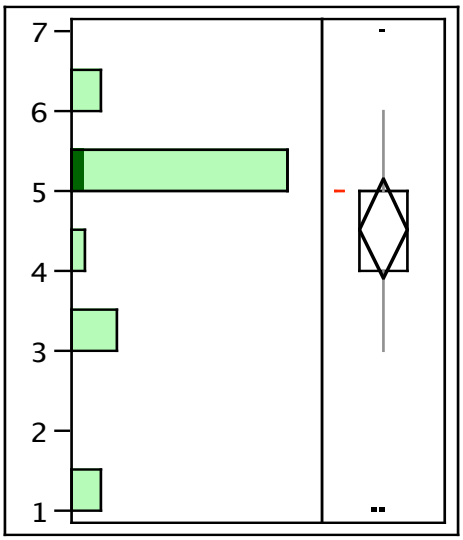
Open University



Moments

Mean	4,3846154
Std Dev	2,0223114
Std Err Mean	0,5608883
Upper 95% Mean	5,606686
Lower 95% Mean	3,1625448
N	13

Tampere Polytechnic University



Moments

Mean	4,5217391
Std Dev	1,4418916
Std Err Mean	0,3006552
Upper 95% Mean	5,1452598
Lower 95% Mean	3,8982184
N	23

Figure 35. eLearning improved critical thinking skills (1=completely disagree, 7=completely agree).

5.6. OPEN-ENDED QUESTIONS

There were two open-ended questions in the questionnaire as follows:

1) Please describe with your own words what specific features of the class made this eLearning course a success? For example could more have been done to foster collaboration?
2) Please describe with your own words what specific features of the class made this eLearning course a failure?

The specific responses to the question "What specific features of the class made this eLearning course a success?" can be found in Appendix B. The specific responses to the question "What specific features of the class made this eLearning course a failure?" can be found in Appendix C.

It was possible to identify some common traits in the responses. These traits were following:

1) Learning environment (17 comments)
2) Collaboration (13 comments)
3) Tools and technology (9) comments)
4) Teaching staff (moderators, tutors, facilitators etc.) (5 comments)
5) Student related issues (5 comments)
6) Support material (books, readings etc.) (2 comments)
7) Degree program management (1 comment)

Most of the comments concentrated on three key issues, which were the learning environment, collaboration, and tools and technology. The other topics received relatively few comments.

Learning environment

Learning environment received the largest number of comments. Here are comments:

1) It is a typical badly organized OU course and I feel like a guinea pig. (OU)
2) I should be able to work when I have time available - i.e. fits in with my work

commitments and domestic issues. (OU)

3) Course has been quite good. (TPU)
4) It would have been good if a pre-course meeting could have been organized and clarify the course procedure. (TPU)
5) A start-up meeting (e.g. the first lesson) would have been good. (TPU)
6) The thoughts of other students were visible to read. The large amount of exercises clarified the theory towards practice. (TPU)
7) Workload and time frames make it challenging for me to complete tasks, and group coordination is difficult coping with different time frames. (OU)
8) Not enough thought and preparation. (OU)
9) The cycles in this course have long enough. (TPU)
10) The alternating roles when answering questions and commenting has been surprisingly good. (TPU)
11) There should have been some kind of kick-off lecture in real life to get the team members know each other. Now it took a lot of (wasted) time to gather the group together. (TPU)
12) I think traditional and eLearning methods should be combined to make this course to a success. (TPU)
13) Organized structure in learning environment is very important. Some discussions (answers to course questions) will become very long (almost 60 posts on one page), there might be some way to organize these answers (or the page) so that the information is easily 'readable' (I might not know all 'tricks' on the page though). (TPU)
14) The responses of the participants to the questions could be kept hidden as long as all participants have responded. This would make the answers a little different. (TPU)
15) I think this kind of course is not suitable as virtual course. (TPU)
16) It would have been advisable to kick start the course with one face-to-face meeting with the participants. In this meeting the general guidelines and procedures of the course could have been explained in much more clear manner than in the Moodle course info.
17) First time should have been face-to-face and all the contents etc. of the course should have been explained clearly.

The overwhelmingly most important issue by the TPU students was the kick-off meeting prior the start of the course. There are possible reasons for this. It could be that:

1. The learning style of the students is not quite as suitable to eLearning as it should be. Students feel a little uncomfortable with eLearning (average of the responses 4,78).
2. Limited experience with eLearning (average of the responses 3,17).

The need for the kick-off meeting was felt necessary in spite of the fact that the respondents felt that respondents' background was suitable for eLearning (average of the responses 5,39). The need for the kick-off meeting was also confirmed by the need of physical meetings (average of the responses 5,35).

Interesting comments were also made regarding the structure of the course. The two courses had very different kind of structures. The OU course had a very complicated structure also so that external parties provided many of the learning environments, which should not be a major issue as long as the learning environments work properly and also that the number of the learning environments remains limited. The timing of the activities here is also important. The OU course a weekly schedule and the TPU runs a biweekly schedule. Time is an important issue for both groups since all the participants are working adults, and it might be that the biweekly schedule is more suitable for working adults and gives them a little more flexibility.

Collaboration

Collaboration received a lot of comments as well. Here are comments:

1) Maybe small groups of learning 'buddies' (about 4 people) could be set up from the beginning of the course with photos and instant message details to provide peer feedback and moral support. (OU)
2) Perhaps, there should be more clear directions about collaborative tasks, because, at least, in my case, I feel a bit lost about what to do and how to do it. (OU)
3) Blogging added an extra opportunity for collaborative reflection, which I found beneficial. (OU)
4) The use of the bulletin board system, and the use of eportfolios and blogs to

share your work with lecturers and others. (OU)

5) I think the collaboration using conferences has been absolutely essential and a really good feature of the course. (OU)
6) Although we are physically remote it feels as if we are learning community and we are able to share ideas and knowledge in a beneficial way. (OU)
7) This course at the moment is not a success, it is a disaster area, and not enough thought has been given to socialization of the students. (OU)
8) On the other hand the collaboration in the project assignment has been very productive and innovative (partially because the group members are all highly skilled). The idea of getting feedback from other students itself is a good one. (TPU)
9) Too early to say as (regard to failure of the class) we are only part way through the course. I do find that it depends on the cooperation of students via IM, forums etc. This depends very much on the group dynamic and tutor direction (luck of the draw?) (OU)
10) There are a lot of participants - this is good because there are a lot of different opportunities to learn about other people's viewpoints but it bad because there is too much 'noise' and it is difficult to focus on one area. (OU)
11) On the success side the sharing and discussion with others and on the less successful side the overload of conferences, it takes a great deal of time to check all these. (OU)
12) The amount of group work that seems to be required is not helpful. It should have been called the e-group work professional. (OU)
13) This group work thing has been really good. (TPU)

Interestingly the OU respondents again made most of the comments. This can be due to the fact that the OU course expected a lot of collaboration; maybe a little too much at times, because many students had problems fulfilling the collaboration requirements on time. Collaboration is an important feature of these kinds of classes and the facilitation of them should carefully planned and managed by the use of conferencing, discussion boards etc.

Tools and Technology related comments

It is interesting to note that all "Tools and technology" comments were given by the OU respondents. Here are comments:

1) I've got many very interesting links from the teacher and other students that may not have gone in to my mind.
2) I think it successful because of the content and tools we are learning and how tutors are helping us.
3) I don't think we need to do this (*sharing experience*) in so many ways i.e. first class, wikis, and blogs one or two would be sufficient.
4) We are using and gaining experience with quite a good range of the technologies currently available for eLearning. I am slightly concerned some of the versions are not actually start of the art.
5) The technology is clouding the situation. It is a typical badly organized OU course and I feel like a guinea pig.
6) I think that after this course I will have a good knowledge of how to deal with ePortfolios, wikis, blogs, podcasts, etc.
7) The technical challenges are quite frustrating and it would be good to have had more help with that.
8) Positive and innovative use of technology, with very little gaps for lack of understanding.
9) Range of techniques used (*made this course a failure*).

It is no surprise that this issue received so many responses for the reason that tools and technology play a key facilitating and supporting role for learning in both classes. It is somewhat surprising that the number of negative comments as regards to the OU course, in which the author of this paper was also a participant, was quite limited taking into account the amount of technical problems that the participants in the eLearning Professional class encountered.

There were no negative or positive comments towards to TPU course in this section. The reason for this probably was the fact that the tools and technology worked well probably due to the fact the tools and technology (Moodle) were relatively simple and tested in many, but not similar courses.

Teaching staff (moderators, tutors, facilitators etc.)

There were some comments presented regarding teaching staff. Here are comments:

1) They (tutors) are very helpful and efficient. (OU)
2) The role of the tutor/ moderator is extremely important. (OU)
3) There are questions tutors cannot answer. (OU)
4) I just would have liked the facilitator to comment on all the answers briefly as well. (TPU)
5) Additionally I am unclear about the role and function of the moderators - they 'speak' like tutors but should surely be technical assistants?

The two classes are very different regarding the use of teaching staff. The TPU class has just one instructor (note: there are about 30 participants in the course) and the OU class has about 10-12 tutors and instructors (note: there are about 150 participants in the course). Even relatively speaking the number of teaching staff per students is larger in the OU class. It is quite obvious, and not only from the above comment, but also from the point of view of the author of this article as a participant in the eLearning Professional course, that the role of all OU staff members is not quite clear. It could be also that the TPU course could benefit of having an additional staff member.

Student related issues

There were some comments presented regarding student related issues. Here are comments:

1) One has to be good at expressing himself in writing. (TPU)
2) Taking personal responsibility for interpreting the various papers was useful. (OU)
3) The course could not motivate at least my group members, enough to do anything else than the mandatory requirements. This is probably due to the people, but can’t be that the same people do all of the work. (TPU)
4) The Haverila book was complicated, because I didn’t comprehend the basic terminology. (TPU)
5) I know that some of the students are really having difficulties with the English book. I'm just glad I'm not one of them since the subject itself is challenging enough without the whole 'translation' sequence in between. (TPU)

Support material

There were some comments presented regarding supporting material. Here are comments:

1) I liked both books, which we have to read in this course. (TPU)
2) The amount of literature has been sufficient. (TPU)

Degree program management

There was one comment presented regarding degree program management. Here is the comment:

1) Only one course at a time would be suitable. Now, when there are many courses at the same time, (I feel) there's not enough time to use for this course than I would like to. (TPU)

6. CONCLUSIONS

eLearning is a fascinating new and versatile learning environment, which many companies and educational institutions have adopted since the emergence of Internet. This study concentrated in the development and facilitation of highly interactive, collaborative and process oriented courses. The courses were conducted at two universities, Open University in the United Kingdom and Tampere Polytechnic University in Finland. The courses were eLearning Professional and Software Business respectively.

Background of the students

The questionnaire included both open-ended and closed-ended questions. There were some differences in the background of the two participating groups. The Open University (OU) respondents worked primarily in the teaching profession, while the Tampere Polytechnic University students worked in technical (IT) profession.

Other characteristics of the respondents

Regarding the other characteristics of the respondents the two groups were rather similar regarding the following issues (1=low, 7= high):

1) Uncertainty tolerance (OU mean 4,84 and TPU mean 4,60)
2) Time management skills (OU mean 4,23 and TPU mean 4,48)
3) Motivational level (OU mean 5,92 and TPU mean 5,78)

Some differences between the two groups existed regarding the other characteristics in the following issues:

1) Learning style suitability to eLearning (OU mean 5,92 and TPU mean 4,78)
2) Active learner and self-starter. (OU mean 5,84 and TPU mean 4,82)

Prior educational conditions

Obviously the field of degree of the respondents was different. The time elapsed from the last degree was also somewhat different so that the degree of OU respondents was a bit more recent. Also the OU students were more experienced with eLearning. As regards to the comprehension of the basic terms prior to entering the course both groups were rather indifferent so that the TPU respondents indicated

lower scores in this question. The attitude of the respondents towards eLearning in both groups was rather positive and remarkably high among the OU respondents. Attitude has been shown to be one of the key indicators of success in online training (Cereijo, 2006).

Perceptions of the respondents regarding the characteristics of eLearning

Both groups thought that eLearning enabled somewhat faster learning with OU respondents agreeing more with this statement. Both groups also somewhat agreed with the statement that eLearning improves learning again so that the OU respondent agreed more with this statement.

The groups were a bit divided regarding if learning is easier in the eLearning mode that in the traditional learning mode. Again the OU respondents were more positive in this question.

Both groups thought that eLearning improves productivity with more positive responses by the OU respondents. One would have expected that the responses even more positive to this question (now the responses were OU=4,76 and TPU=4,26), especially because the respondents were adult learners. Time is typically of essence for adult learners.

Again both groups thought that their backgrounds are suitable to eLearning. This was the case especially as regards to the TPU respondents. It is quite probable that the reason is the IT background of the TPU students.

In relation whether the courses taken are suitable to eLearning, both groups agree with the statement, particularly in the case of OU students. The difference between the responses of the OU and TPU respondents appears to be significant.

Collaboration seems to help learning in both cases. The means of the responses (OU=4,77, TPU=4,48) were somewhat low, however. One would have expected that the statement would have got quite a bit of support due to the interactive and group oriented nature of the courses. In the case of the OU responses there were some completely opposite opinions to this, and it might be that this explains the somewhat

low mean. Another thing is that the pace of learning varies between the students, maybe due to the different levels of motivations and time constraints, in both cases, especially in the OU course, and this might actually decrease the benefits of collaboration (Haverila, 2006). Therefore, in order to really to reap benefits from collaboration, it is essential that the schedule of the course is created flexible enough so that most of the students have a chance to participate in collaborative activities.

Both groups thought that physical meetings would contribute positively towards learning. This is an interesting issue, especially in the case of the OU respondents, because the respondents are aware of the fact that the course did not facilitate physical meetings and also that organizing physical meetings was impossible, because the students were from all over the world.

It was agreed by both groups that eLearning facilitates the use of up-to-date information and data. Again one would have expected that this statement would have gained even more support, because the great benefit of Internet is to publish information and data immediately when it becomes available. Books and journal articles in paper format are typically several years behind.

Both groups confirmed the need for synchronized and asynchronized meetings. This was the case even more so in the case of asynchronized meetings. This is understandable, because organizing a synchronous meeting is quite difficult even though the participants are all in the same time zone.

Both groups agreed that the responsibility of the student is greater than in the traditional learning. This was the case especially in the case of the TPU students. This was an expected result and conforms to the adult learning research (Knowles, 2006).

Also both groups agreed that eLearning is more suitable to the individual needs than traditional learning. This is an interesting issue and may be explained by the possibility to immediately extend to the Internet at the time of learning, which is quite difficult in the traditional classroom learning.

The statement that eLearning is more effective than traditional learning was slightly supported by both groups. The result was, however, inconclusive to both directions. Previous research has shown that there are no differences in this regard between the two modes (Fortune, 2006).

The responses of the OU and TPU groups differed regarding the question "Is learning better in the traditional mode if both modes are used". The OU respondents slightly disagreed with this and the TPU respondents somewhat agreed with the statement. In the open questions, one of the TPU respondents suggested that the course should use both traditional and eLearning mode. The responses to the question "Is learning better…" by the TPU respondents seem not to support this individual opinion.

Both groups preferred eLearning to traditional learning and more so in the case of the OU respondents. The reason for the somewhat inconclusive support of the TPU respondents might be due the limited experience of the students in eLearning and also the fact that the responsibility in eLearning is more on the shoulders of the student than in traditional learning.

Both groups were quite indifferent in this question between eLearning and traditional learning showing, however, some support to the statement that they are actually learning more with eLearning.

As far as grading is concerned, both groups agreed to a degree that they will get same grades in the eLearning and traditional courses. The support for the statement was somewhat low, especially in the case of the TPU students.

Regarding whether eLearning improves the critical thinking skills, both groups somewhat agreed that this is the case (OU=4,38, TPU=4,52). This is a surprising result in the case of the OU respondents, because in the OU class there is a very heavy emphasis in improvement of critical thinking skills and reflection. Thus it was reasonable to expect that the OU respondents would have supported the statement more strongly.

7. LIMITATIONS

This study surveyed students in an IT (Software business, a Tampere Polytechnic University course)) course and eLearning Professional (an Open University course) only. Results therefore cannot be generalized. In addition, students surveyed were at two universities only and these results cannot be generalized to students at other colleges and universities. As regards to the findings in the case of the TPU, it may be that the university, where the students were surveyed, is not effectively using eLearning methodologies, and thus the respondents are thus quite inexperienced in eLearning. It may also be that the technology (in this course Moodle, which is based on open source code) used is not enabling effective use of eLearning due to the limitations of the software.

This study utilized qualitative research method and the number of responses was quite low, especially in the case of OU. The researcher approached the eLearning Professional course management and got only a limited permission to conduct research. This means that the invitation to participate into this research was posted in the General Discussion Forum only. The researcher made the point that this will limit the number of responses, but inspire of the request no permission was granted to send an E-Mail to every participant of the eLearning Professional course (Note: There was about 150 participants in this course). This is quite interesting in lieu the fact that OU greatly embraces eLearning research by the students, but not in their course. This is really too bad, because a greater number of responses would have given much more credibility to the findings. As such the results are interesting, but only indicative especially as regards to the OU responses.

8. RECOMMENDATIONS

On the basis of the research following recommendations can be made for a course, which is highly interactive and process oriented, to be carried out in the eLearning environment.

1. Since all the elements in the Bloom taxonomy for learning are used in the interactive and process-oriented course with an emphasis on the higher levels of learning, the course design should enable analysis, synthesis and evaluation of material based on asynchronous mode.
2. In case the students do not have experience in eLearning, it is important that the procedures, software tool, material to be covered and expectations are explained in detail before the course, preferably in a special physical face-to-face setting so that students can check whether eLearning is suitable for them or not. In addition it is important to explain for the students that learning is eLearning mode is much the responsibility of the student that perhaps in the traditional learning mode.
3. The projects to be used should be tailored to meet the needs of the participants.
4. The schedule to should be accommodative enough; not too demanding and not too loose, but expectations should still be set in a specific time frame.
5. Collaboration should be an important element in an interactive and process-oriented course, because that facilitates learning from others in deep learning mode.
6. Enhancement of critical thinking and reflection should be also an important element in an interactive and process oriented course. This can be achieved by peer-to-peer assessment of assignments and conferencing in a team environment.
7. The inclusion of learning options that require the learners to use up-to-date information is essential in an interactive and process-oriented course in order to take full advantage of eLearning.
8. Continuous feedback by the facilitator is an important element of an interactive and process-oriented course.
9. Since time management is an important element in any, but especially interactive and process-oriented course, it is important to emphasize for the

participants the meaning of schedules in order to gain full advantages of eLearning and collaboration.

10. Like in any course, but especially in interactive and process-oriented course, it is important to make sure that the participants meet pre-specified requirements for the course. This guarantees that participants are able to participate in the course to best of their ability, and not blocking the advancement of their fellow students.
11. It is important to make sure that the technology to be used in the interactive and process-oriented course works well and is robust so that unnecessary frustrations, which are not related to the actual learning process, can be avoided.

9. SUGGESTIONS FOR FURTHER RESEARCH

eLearning is a relatively new area of research and has only emerged since the evolution of Internet. The expectations have been enormous regarding the use of eLearning in universities and colleges as well as in many corporations. Many universities have quickly adopted this new platform with vengeance. Also some large global corporations are eLearning as a main delivery platform of corporate education. It is important, however, that eLearning is based on sound pedagogical foundations. Therefore it is important, that the various venues and opportunities are properly researched.

This research concentrated on a particular aspect of eLearning, which is on interactive, process oriented and reflective eLearning courses and the pedagogical aspects of these kinds of courses. As regards to further research is concentrated, it would be important, if at all possible, to test the results of this research in a larger scale so that the results could be validated also statistically. This might require the use of longitudal studies so that a satisfactory sample size could be achieved.

Furthermore, using the approach of this study maybe also different kinds of pedagogical settings could be researched. The Bloom's taxonomy could be used as a basic framework here for the establishment of the setting of the research. In this study the higher levels of the Bloom taxonomy were used as a framework. It would be interesting to see what the outcome(s) would be in other levels.

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APPENDIX A. The questionnaire

Prior educational conditions

1) Field of the degree before entering the eLearning course
   a) Business
   b) Computer science
   c) Information systems
   d) Other

2) Time elapsed from last formal learning experience. Please specify the number of years_____.

3) Experience with eLearning

   1…….2…….3…….4…….5…….6…….7

   Poor Excellent

4) Comprehension of the basic terms for the course in question prior entering the computer business class.

   1…….2…….3…….4…….5…….6…….7

   Poor Excellent

5) The attitude of the student towards eLearning prior entering the class.

   1…….2…….3…….4…….5…….6…….7

   Poor Excellent

6) The attitude of the student towards the use of computers prior entering the class.

   1…….2…….3…….4…….5…….6…….7

   Poor Excellent

Characteristics of the student

1) Age, please specify_____.

2) Gender
   a) Male
   b) Female

3) Marital status
   a) Married
   b) Single

4) Nature of the practical experience
   a) Technical
   b) Business

5) Length of your work experience
   a) None
   b) 1-4 years
   c) 5-9 years
   d) More than 10 years

6) My tolerance for ambiguity is high.

   1…….…2…...….3…….....4…….….5…..…...6…..…...7

   Completely disagree Completely agree

7) My learning style is suitable for eLearning.

   1…….…2…...….3…….....4…….….5…..…...6…..…...7

   Completely disagree Completely agree

8) I am an active learner and self-starter.

   1…….…2…...….3…….....4…….….5…..…...6…..…...7

   Completely disagree Completely agree

9) My time management skills are excellent.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

10) My motivational level is high

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

Characteristics of eLearning

1) eLearning enables me to accomplish learning more quickly (no time/place limitations).

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

2) eLearning mode improves my learning.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

3) The use of eLearning makes learning easier for me

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

4) Using eLearning improves my productivity in learning.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

5) My background and education are particularly suitable to eLearning.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

6) The software business course is suitable to be carried out with the eLearning mode.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

7) The collaboration with the fellow students contributed greatly towards learning.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

8) Physical meetings contribute towards learning.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

9) ELearning facilitated the use of most up-to-date information and data in the course.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

10) There is a necessity and benefit for synchronized meetings (i.e. the use of chat and conferencing) in this class.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

11) There is a necessity and benefit for asynchronous meetings (i.e. E-Mail, blogs, threaded discussions).

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

12) The responsibility of the student in the eLearning mode in comparison to traditional mode of teaching delivery is far greater.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

13) The eLearning is more suitable to the individual needs of the student than the traditional delivery mode?

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

Perceived effectiveness

10) Most participants believed that eLearning is more effective than traditional methodologies.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

11) In a course with both traditional and eLearning methodologies, I learn better through the traditional portion.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

12) I prefer eLearning courses to traditional courses.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

13) I learn more in an eLearning course than in a traditional course.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

14) To the best of my knowledge I am able to get the same grade in an eLearning course than in a traditional course.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

15) The use of eLearning mode improved my critical thinking skills in the course.

1…….…2…...….3…….....4…….….5…..…...6…..…...7

Completely disagree Completely agree

16) Please describe with your own words what specific features of the class made this eLearning course a success? For example could more have been done to foster collaboration? _____

17) Please describe with your own words what specific features of the class made this eLearning course a failure? _____

APPENDIX B. Responses to open ended question: What specific features of the class made this eLearning course a success?

OU responses

1. I think the question is flawed. I find traditional learning much more effective BUT for me it's not practical. Work and home location make it impossible. I enjoy learning in general, prefer f2f contact in general but recognize the value of elearning for people and me in my situation.
2. Maybe small groups of learning 'buddies' (about 4 people) could be set up from the beginning of the course with photos and instant message details to provide peer feedback and moral support. Compare with dieting - people have more success with Weight Watchers than dieting alone! The online course could have checkmarks to show when one has completed each piece of the course.
3. I've got many very interesting links from the teacher and other students that may not have gone in to my mind.
4. I think it successful because of the content and tools we are learning and how tutors are helping us. They are very helpful and efficient. Perhaps, there should be more clear directions about collaborative tasks, because, at least, in my case, I feel a bit lost about what to do and how to do it.
5. It's a bit early to say this. Individual contact with other students has been helpful
6. Blogging added an extra opportunity for collaborative reflection which I found beneficial
7. The role of the tutor/ moderator is extremely important
8. The conference although a bit too many of them are a very good way of sharing experience and learning and contribute greatly to the course, but I don’t think we need to do this in so many ways i.e. first class, wikis, and blogs one or two would be sufficient.
9. The use of the bulletin board system, and the use of eportfolios and blogs to share your work with lecturers and others
10. We are using and gaining experience with quite a good range of the technologies currently available for elearning. I am slightly concerned some

of the versions are not actually start of the art. There seems no built in procedure for students to comment and suggest things, which on a first or 2nd running could be useful. The exposure to some of the material and thoughts of other students shows a tremendous range of aptitude and contribution. It's illuminating and frightening how productive some are (and they have jobs and families). There are perhaps aspects of good practice that the course doesn't employ (quite old but see George Siemens checklist of 2002 at http://www.elearnspace.org/Articles/lessonslearnedteaching.htm). There is no analogue to the seminar. With our group including people in China, Philippines, UK and USA maybe there cannot be a synchronous chat room but the asynch conference technology is very weak (no searching, indexing, bookmarking, resetting 'read' flag). By the time I reflect that something was worth quoting I've probably forgotten where it was.
11. I think the collaboration using conferences has been absolutely essential and a really good feature of the course. Although we are physically remote it feels as if we are learning community and we are able to share ideas and knowledge in a beneficial way.
12. This course at the moment is not a success, it is a disaster area, not enough thought has been given to socialization of the students, there are questions tutors cannot answer. The technology is clouding the situation .It is a typical badly organized OU course and I feel like a guinea pig.
13. I should be able to work when I have time available - i.e. fits in with my work commitments and domestic issues

TAMK responses

1. Kurssi on ollut ihan hyvä. Itseltäni toivon paljon enemmän mitä nyt olen pystynyt tekemään tämän eteen. Toisaalta johonkin pitäisi olla myös tyytyväinenkin. Sairastan masennusta, mikä suurimmalta osin vaikuttaa työpanokseeni tässä opiskelussa. Olen aikaisemmin ollut lahjakas oppilas ja siihen haluan vielä palata jos vain enää mahdollista.
2. Pitää olla hyvä ilmaisemaan itseään kirjallisesti. Ennen kurssin alkua olisi ollut hyvä kokoontua yhden kerran ja käydä läpi kurssin etenemiseen ja toteutukseen liittyviä asioita. Nyt perusasioiden selvittämiseen meni liian paljon aikaa. Aikuisopiskelijalla aika on kortilla ja olisin toivonut käyttää sen kokonaan itse substanssiin eikä opiskelun opetteluun. Yhteistyön kannalta olisi hyvä, jos oman ryhmän jäsenet olisi tuntenut paremmin. Pelkästään verkkokurssina toteutettava kurssi kannattaisi pitää vasta jonkin ajan kuluttua opiskelujen aloittamisesta, jotta muut opiskelijat olisivat jo tutunpia. Tämä olsi edistänyt vuorovaikutusta ja ehkä kurssista olisi tullut enemmän keskustelevampaa kuin nyt.
3. A start-up meeting (e.g. the first lesson) would have been good.
4. Opitun asian soveltaminen uudessa asiayhteydessä ja siitä keskusteleminen syventää oppimista
5. Pidin molemmista kirjoista, jotka meidän piti lukea tällä kurssilla. Ne tukivat hyvin kurssia.
6. The evaluations of the other participants' answers tend to be a bit thin in substance. This might be because the answers of the specific groups are very similar with one other so there is basically 4 people writing the same things in different words. Not very productive. On the other hand the collaboration in the project assignment has been very productive and innovative (partially beacause the group members are all higly skilled). The idea of getting feedback from other students itself is a good one. I just wouod have liked the facilitator to comment on all the answers briefly as well. This would have given a clear definition of the level of expectation the facilitator had from the groups performance.
7. Toisten ajatukset harjoitustöiden muodossa olivat kaikkien nähtävillä ja luettavissa. Harjoitustöiden suuri määrä lisäksi selvensi teoriaa käytäntöä kohti.

APPENDIX C. Responses to open ended question: What specific features of the class made this eLearning course a failure?

OU responses

1. Too early to say as we are only part way through the course. I do find that it depends on the coopeation of students via IM, forums etc. This depends very much on the group dynamic and tutor direction (luck of the draw?)
2. There are a lot of participants - this is good because there are a lot of different opportunities to learn about other people's viewpoints but it it bad because there is too much 'noise' and it is difficult to focus on one area.
3. I find it very successful because we are trying to be collaborative and tutors are helping us to learn how to use tools that are new for us. I think that after this course I will have a good knowledge of how to deal with ePortfolios, wikis, blogs, podcasts, etc., but the most important thing for me would be to learn how to use &/ improve reflection in a sensible way. I also find the other students very kind and helpful.
4. The technical challenges are quite frustrating and it would be good to have had more help with that. Additionally I am unclear about the role and function of the moderators - they 'speak' like tutors but should surely be technical assistants?
5. The opportunity for taking personal responsibility for interpreting the various papers was useful (viewing them in my own context), the blogging was very helpful, the tutor group conference helped me engage with course topics, the Wiki wasn't that useful - interesting, but not particularly engaging - and the ePortfolio was frustrating but gave a glimpse of its potential.
6. On the success side the sharing and discussion with others and on the less successful side the overload of conferences, it takes a great deal of time to check all these.
7. Success: Positive and innovative use of technology, with very little gaps for lack of understanding. It brings together people from a wide range of experiences and geographical locations to share knowledge and tools. Negative: workload and time frames make it challenging for me to complete tasks, and group coordination is difficult coping with different time zones.

Overall I'm finding it very interesting
8. Range of techniques used. Associate lecturer / tutor very knowledgeable.
9. Not enough thought and preparation see above at the moment for me it is a failure.
10. The amount of group work that seems to be required is not helpful. It should have been called the e-group work professional.

TAMK responses

1. Tällä kurssilla on ollut sopivan mittaiset nämä syklit. Olen toistaiseksi pysynyt niillä mukana ja siihen minun pitäisi itsessäni olla tyytyväinen. Se, että niiden ajankohdat ovat juuri ne mitkä ovat ja jos aikoo kurssilla pysyä, pitää pysyä tahdissa. Se on minutkin pitänyt mukana. Masentunut ihminen tarvitsee jonkin ulkopuolisen 'potkimaan' eteenpäin ja se onnistuu jos motivaatiota on. Ja kyllä sitä minulla on, vaikka asiat välillä on vaikeita ja ihan erilaisia kuin mitä ennen on opiskellut. Tuo projektiryhmäjuttu on myös tosi hyvä. Oon odotellut innolla että jotain tapahtuisi. Harmittaa vain etten sitä ole postaillut sinne palstalle. Viime lähiopetuspäivänä joidenkin ryhmäläisten kanssa yritin keskustelua saada aikaiseksi mutta turhaan. Kai mulle on toi palsta vähän vieras tapa. Pitää opetella käyttämään sitä. Nämä syklit ovat siis olleet sopivan mittaisia ja tämä tapa vuorotellen itse tehden tehtävät ja vuorotellen kommentoiden on ollut yllättävän hyvä. Omalla tavallaan yhtä vaikeita, joskus on tosi vaikea löytää mitään sanottavaa joidenkin tosi hyviin ja tyhjentäviin vastauksiin. Kirjallisuutta on ollut sopivasti. Ja tuo projektiryhmäjuttu on varmasti tosi hyvä, odotan sen etenemistä mielenkiinnolla.
2. Failure: There should have been some kind of kick-off lecture in real life to get the team members know each other. Now it took a lot of (wasted) time to gather the group together.
3. I think traditional and eLearning methods should be combined to make this course to a success.
4. Organized structure in learning environment is very important. Some discussions (answers to course questions) will become very long (almost 60

posts on one page), there might be some way to organize these answers (or the page) so that the information is easily 'readable' (I might not know all 'tricks' on the page though).
5. Kurssi ei pystynyt motivoimaan ainakaan minun ryhmäni jäseniä tarpeeksi tekemään muuta 'kuin pakolliset' ajoissa. Johtuu varmaankin ihmisistä, muttei se saa mennä siihenkään, että vain osa tekee ja keikki pääsee läpi.
6. Mielestäni tällainen kurssi ei kaikilta osiltaan sovi verkkokurssiksi. Ainakin muutama lähiopetuskerta, aloitustunti jne. olisi ollut tärkeä olla.
7. Kurssilaisten vastaukset voitaisiin pitää niin kauan piilossa, että kaikki ovat vastanneet ja vasta sen jälkeen ne tulisivat julkisiksi. Mielestäni vastauksista tulisi siten huomattavasti enemmän erilaisia.
8. It would have been advisable to kick start the course with one face to face meeting with the participants. In this meeting the general guidelines and procedures of the course could have been explained in much more clear manner than in the Moodle course info. I know that some of the students are really having difficulties with the English book. I'm just glad I'm not one of them since the subject itself is challenging enough without the whole 'translation' sequence in between.
9. This was first time for me to use elearning and Moodle.
10. Haverilan englannin kielinen kirja turhan monimutkainen, koska tämä alan sanasto ei alkuunkaan hallussa.
11. First time should have been face-to-face and all the contents etc. of the course should have been explained clearly.
12. Only one course at a time would be suitable. Now, when there are many courses at the same time, (I feel) there's not enough time to use for this course than I would like to.