Open University Cyprus **Hellenic *Open University***

Master's join degree/post graduate Programme
Enterprises Risk Management (ERM)

MASTER THESIS

Multicriteria evaluation in measuring student satisfaction: the case of Open University Cyprus

Veniamin S. Veniamin

Academic Supervisor
Ipsilandis Pandelis

May 2018

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«Enterprises Risk Management (ERM)»
Faculty of Economics and Management

Open University of Cyprus **Hellenic Open University**

May 2018

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Executive Summary

The purpose of this postgraduate dissertation is to investigate students' satisfaction with Higher Education Institutes (HEIs). In particular, the present dissertation represents a study dealing with the evaluation of students' satisfaction with the Open University of Cyprus (OUC).

The main objective of the study is to identify the factors that are important in determining satisfaction experienced by students in HEIs; and to identify in what extend those factors influence students' satisfaction with OUC. One of the main interests in this research is to identify groups with distinctive preferences and expectations. Another point of interest is to observe whether students' expectations from online learning are different from previous conventional studies.

The methodological approach is based on the development of a multicriteria satisfaction model and relies on the assumption that students' satisfaction depends on a set of variables and criteria.

According to the findings, the study concludes that students' satisfaction with Higher Education (HE) is determined by the academic personnel, content of the programme, the educational process and infrastructure and support services. Although OUC students are generally satisfied with the above criteria and their overall experience, the results are suggesting marginal improvements, with the content of the academic programmes being in the center of priority. Furthermore, faculty of study is the main factor significant with students' satisfaction. In addition, students are satisfied with online experience compared with previous conventional education experience.

In conclusion, although extend of meeting students' expectations is generally high there is still room for improvement, since students' expectations determine the outcome of satisfaction.

Keywords: students' satisfaction, quality, HE, HEIs, multicriteria analysis, students

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Chapter 1
Introduction

In recent years, the higher education sector is expanding rapidly all over the world, becoming an increasingly competitive market for higher education institutions trying to satisfy their main customers (students). Technological advancement, internationalization of education and research; and reorganization of knowledge have shifted the strategic emphasis of institutions from a teaching-oriented model to a service model (e.g. Kuo *et al*., 2013; Parahoo *et al*., 2013). As a consequence, assessing and managing the key factors determining students' satisfaction has become a priority for HEIs in order to maximize their performance.

1.1 Purpose of the postgraduate dissertation

The purpose of this postgraduate dissertation is to investigate students' satisfaction in higher education (HE) and to introduce a conceptual model of students' satisfaction with their higher education experience, based on the identification of the variable determinants of students' satisfaction with the overall student experience. A useful variety of information and data focused on global and partial explanatory analysis for each determinant of students' satisfaction will be also provided.

1.2 Theoretical Background

Institutional evaluation represents one of the most modern and interesting issues of higher education systems. In recent years, higher education is been through significant transformation and reform with respect to meeting the demand for knowledge and the growing role of information and communication revolution, representing the new challenges of globalization (Marginson, 1998; Salmi, 2001). A study by International Development Programs (IDP) Australia estimates that the global demand for international higher education will grow fourfold to approximately 7.2 million students,

by 2025, representing a 5.8% compound growth rate between 2000- 2025. At the same time different marketing strategies are implemented to attract the growing number of students seeking higher education.

The globalization of education has intensified competition among universities, not only for local, but also for international students. As a consequence, Higher Educational Institutions (HEIs) are now becoming more business-like, facing pressure to improve value in their activities (Heck and Johnsrud, 2000), aiming to understand what students actually expect from HE. At first glance, students' satisfaction is easy to be defined. However, there are hundreds of scientific articles trying to define this concept, to quantify it and to measure its impact (Letcher and Neves, 2010). Elliot and Shin (2002) define student satisfaction as students' disposition by subjective evaluation of educational outcomes and experience. Students' satisfaction is a short term attitude, resulting from an evaluation of students' educational experiences. It is a positive antecedent of student loyalty and is the result and outcome of an educational system (Zeithaml, 1988).

Besides the obvious long-term advantages of having 'satisfied customers', who are more likely to return for follow-up education or who share their positive experiences with peers (Gu, Schweisfurth and Day, 2010), an increasing number of institutions are using student evaluation instruments to monitor and improve the teaching and learning experience (Arbaugh, 2014; Eom, Wen and Ashill, 2006; Rienties, 2014). The measurement of student's satisfaction has attracted a significant interest among researches over the past two decades and is increasingly important to HEIs, to help them to pinpoint their strengths and identify areas for improvement (Eom et al, 2006; Kember and Ginns, 2012; Marsh, 1982a; Zerihun et al, 2012). The challenge for the institutions is to develop modern operational research and management tools in order to understand and to address the key sources of student satisfaction in their service delivery initiatives. If HEIs achieve to translate students' satisfaction in measurable parameters, they will be able to maximize their performance and thus, gain competitive advantage against competition.

Measuring student satisfaction can be done through various techniques. Most Western institutions in the USA and UK systematically collect learning satisfaction and learner

performance data (Baldwin and Blattner, 2003; Rienties, 2014), but learner evaluation results were only used to improve teaching and learning (Baldwin and Blattner, 2003). Over the years, a range of standardized student evaluation instruments have been developed, such as the Course Experience Questionnaire (Ramsden, 1991), National Student Survey (Ashby et al, 2011; Callender et al, 2014), or Students' Evaluations of Educational Quality Questionnaire (Marsh, 1982b). However, in order to imprint students' satisfaction correctly, the concept of quality must be clarified (Kristensen, 1999). Defining quality in higher education engages many difficulties due to its complex character. Service quality can be defined as discrepancy between consumer service expectation and the perceived service, if the expectations were greater than the performance, the consumer satisfaction will not occur (Parasuraman et al., 1985). The assurance of service quality in the field of higher education has received escalating attention from both researchers and academicians during the last two decades (Tahar, 2008).

The relation between student's satisfaction and service quality in education has attracted greater attention in HEIs' pursuit of competitive advantage. Extensive literature presents the two concepts to be closely related. Shemwell et al. (1998) argue that in today's world of intense competition, the key to sustainable competitive advantage lies in delivering high quality service that will result in satisfied customers. Kelley et al., (1990) and Munteanu et al., (2010) argue that students are believed to be satisfied only when the quality of the service they receive exceeds their expectations. Moreover, Frasier (1997) suggests that continuous quality improvement requires an organization to meet or exceed the customer's expectation of quality.

While many institutions have become reasonably skilled in collecting large amounts of student satisfaction data, making sense of rich data sources and acting upon the data is complex and cumbersome. Therefore, there is a need to adopt techniques that measure service quality and students' satisfaction with HE. Given that student's satisfaction is a complex phenomenon (Benjamin and Hollings, 1997) the execution of reliable student's satisfaction evaluations can be a difficult problem to handle. To grasp the complexity of students' educational experience, it is not enough to know the degree to which students are satisfied. A considerable variety of variables has to be examined in order to identify valid predictors that contribute to student's satisfaction.

The present postgraduate dissertation represents a research dealing with the evaluation of students' satisfaction with the Open University of Cyprus. The OUC is the country's only Higher Education Institution dedicated solely to distance education. The University offers undergraduate and postgraduate programmes, as well as vocational/training programmes of short duration. This dissertation focuses on postgraduate students only.

Although the HE sector in Cyprus has been through great advancement during the last years, an absence of students' satisfaction studies is observed. Furthermore, a growing student demand for online learning in higher education is observed (Cole et al., 2014), and many university presidents view online education as a core component of their higher education programmes (Parker et al., 2011).

The methodological approach is based on the development of a multicriteria satisfaction model and relies on the assumption that student satisfaction depends on a set of variables and criteria. Based on extended literature review, a set of variables is identified to determine educational quality and/or students' satisfaction. The quality variables that also appear to determine students' satisfaction are distinguished and properly grouped to develop the main body of criteria to be used.

1.3 Research Objectives

The purpose of this paper is to contribute to the main knowledge about students' satisfaction with OUC, by adding factors that are important in determining satisfaction experienced by students in HEIs.

The objectives of the postgraduate dissertation are:

- ✓ To identify the factors that constitute students' satisfaction
- ✓ To identify the extend those factors influence students' satisfaction with OUC
- ✓ To identify groups with distinctive preferences and expectations
- ✓ To determine if students' expectations from online learning are different from previous conventional studies

As a consequence, this dissertation aims at identifying the prerequisites of becoming a highly satisfied student, which in turn might stimulate modifications in university environments, support students' adjustments, lead to higher performance levels, and prevent students from dropping out (Starr et al., 1971; Wiers-Jenssen et al., 2002).

1.4 Exposition of the Chapters

Chapter 1 is the introduction, analysing the purpose, the theoretical background and the objectives of the research.

Chapter 2 presents the literature review – dedicated to the concepts of students' satisfaction and service quality in HE; and the relation between the two concepts, based on the characteristics of the operating environment of HEIs.

In **Chapter 3**, existing models used in students' satisfaction studies are divided and analyzed on three categories: SERVQUAL, MUSA, and different methodologies (linear regression etc.). For each methodology, the variables identified to be determinants of service quality, and/or determinants of students' satisfaction are presented, emphasizing the quality determinants that also determine students' satisfaction. Multicriteria methodology is also introduced with special attention on its in appropriateness on students' satisfaction studies.

In **Chapter 4**, the research design and methodology is discussed with special reference to the assessment of satisfaction criteria.

Chapter 5 focuses on the data obtained, survey results and the analysis of main findings.

Chapter 6 presents the conclusions that can be derived from the analysis, limitations of the dissertation and recommendation for future research.

Chapter 2
Literature review

This chapter presents the literature review – analysing the environment where HEIs are operating and the great attention given by HEIs in meeting or even exceeding the needs of their students. The focus of this chapter is on presenting the literature of the concepts of students' satisfaction and service quality in HE; and the relation between the concepts.

2.1 Customer satisfaction in organizations

Customer satisfaction is considered as an important issue concerning all types of business organizations, which is justified by the customer orientation philosophy and the main principles of continuous improvement of modern enterprises.

Customer satisfaction measurement is a necessary condition for applying continuous improvement and total quality management philosophies. It may be considered as the most reliable feedback, considering that it provides in an effective, direct, meaningful and objective way the clients' preferences and expectations. In this way, customer satisfaction is a baseline standard of performance and a possible standard of excellence for any business organization (Gerson, 1993). For this reason, organizations tend to target measuring and translating customer satisfaction into a number of measurable parameters. This justifies the need for developing modern operational research and management tools, which will be sufficient enough to analyze customer satisfaction in detail.

2.2 Measuring students' satisfaction in HEIs

In order to understand the concept of students' satisfaction with HE, important parameters of the operational environment of HEIs should be analyzed.

2.2.1 HE's changing environment

As a consequence of the rise of wide scale reforms across the global HE sector, the role of Universities is rapidly changing and their identity as institutions of education and science is brought into question. Previously constructed definitions and conceptual frameworks are constantly being reframed and redesigned, as online learning continues its rapid growth phase. In that environment, Universities are required to satisfy their many stakeholders who include students, graduates, management, teaching and administrative staff, public authorities that fund universities, labor markets and employers, professional bodies etc.

In 2008, Tomlinson states that University education, once the prerogative of small social elite, is now the expectation of a large proportion of the population whose primary desire is to improve their position on the subsequent employment market. University management is driven toward the delivery of a more transferable and professional skill set that is more closely aligned to the graduate expectations of successful employment (Senior, Moors and Burgess, 2017), creating new benchmarks and ways to evaluate student experiences to reduce frustration when their expectations are not met (Rossing *et al*., 2012).

2.2.2 HE as a service

The elimination of socioeconomic barriers and the opening of opportunities to connect people more closely in time and space are among the dramatic benefits associated with globalization (Mavondo et al. 2004). While education has become more globalized, the market has become particularly competitive for institutions competing not only for local, but also for international students. Continuous technological advances, deregulation, globalization and increased competition have shifted the strategic emphasis of higher education institutions from a teaching-oriented model to a service model (e.g. Kuo *et al*., 2013; Parahoo *et al*., 2013). Education is thoroughly presented as

a service and thus, what is applicable to consumers generally should also, from this perspective, be applicable to students.

The concept of the student as customers is not new. Crawford first used the phrase in 1991, some ten years before UK students became liable for the payment of "up-front" tuition fees, while other researchers have continued to use the phrase (Hill, 1995). According to Oldfield and Baron (2000), higher education can be seen as a "pure" service and for Hennig-Thurau et al. (2002), educational services fall into the field of services marketing. Gremler and McCollough (2004), also characterize students as primary consumers of higher education service. Further, educational services have several service characteristics: they are predominately intangible, perishable, heterogeneous, and the professor's teaching efforts are simultaneously produced and consumed with both professor and student being part of the teaching experience (Shank et al., 1995). However, Yorke (1999) argued that this supplier-customer relationship is not as clear cut as that of some other service relationships, given that students are also "partners" in the learning process. In this connection, Guolla (1999) rightly points out that students could also take the role as clients, producers, and products. Educational services also differ from other professional services in several ways being in a central place in the lives of students, who require huge amounts of motivation and intellectual skills to attain their goals (Hennig-Thurau et al., 2002).

One consistent finding of research is that high quality teaching is an important factor for students' satisfaction. Students' satisfaction and perceptions of the education quality are seen as an indicator of their future recommendation of the institution where they attended, but they are also the best indicator for an organization's future profits (Fornell 1992; Reichheld and Sasser 1990, Chan, et al. 2003). Despite that adequate research suggest a relation of educational quality to student's satisfaction, there doesn't exist a universally accepted concept to quality. Zeithaml et al. (1990) and Winsted (2000), maintain that service providers will only be able to deliver service encounters that will satisfy customers if they know what their customers want. If universities know how their students perceive the offered services, they may be able to adapt their services to a certain degree, which should have a positive impact on students' perceived service quality and their levels of satisfaction. Oldfield and Baron (2000) maintain that "*there is an inclination to view service quality in higher education from an organizational*

perspective". They suggest that institutions should pay attention to what their students want instead of collecting "*data based upon what the institution perceives its students find important*". Similarly, Joseph et al. (2005) point out that research on service quality in higher education has relied too strongly on the input from academic insiders while excluding the input from the students themselves. They believe that traditional approaches leave "*decisions about what constitutes quality of service (e.g. such as deciding what is 'most important' to students) exclusively in the hands of administrators and/or academics*". The authors, therefore, suggest that academic administrators should focus on understanding the needs of their students, who are the specific and primary target audience. Similarly, Douglas and Douglas (2006) suggest that the student experience and its improvement "*should be at the forefront of any monitoring of higher education quality*".

The rise of the consumer model of universities has developed a common philosophy to effectively transcend national boundaries. Increasingly, higher education institutions are beginning to focus more on meeting or even exceeding the needs of their students. To that end they need to be able to measure themselves against the competition. This development is especially true for countries with a tuition-based model (DeShields et al., 2005). As maintained by Williams and Cappuccini-Ansfield (2007), Germany's highest court decision to allow German universities to start charging student tuition fees in 2005, was a reason for universities to act as a "service provider" and be responsive to student requirements. Earlier, Rolfe (2002) maintained that the introduction of tuition fees may change "students' approach to education from that of a recipient of a free service to that of a "consumer". Further, Watson (2003) and Narasimhan (2001) maintain that fee-paying students may expect "value for money" and behave more like consumers.

Moreover, German HEIs decision to switch to the two-level system (bachelor-master) to achieve the objectives of the Bologna process by 2010, would allow every student completing a Bachelor degree in Germany to begin a master's degree at a different university. As suggested by Joseph et al. (2005), HEIs were expected to increasingly turn to treat students as customers, trying to retain them as study results indicate that the recruitment of students is several times more expansive than their retention.

2.2.3 Measuring students' satisfaction

Although measuring students' satisfaction has been conducted through various techniques, traditional mechanisms may be effective in measuring individual's perceptions, but have little impact at the institutional level and almost none across the sector. As if to validate the status of the student as a customer, most developed countries use some form of national survey. On behalf of the UK Government, the Higher Education Funding Council for England (HEFCE) has introduced a National Student Survey. The results were used to produce league tables of university performance and published on the Higher Education and Research Opportunities (HERO) portal. The position of a university in any league tables will impact ultimately on its brand image, which has a strong impact on the attraction of potential students (James et al., 1999; Palacio et al., 2002). Some years later Asthana and Biggs (2007) argued that the National Student Survey has become increasingly important in the decision making process for students in selecting which University they will attend. Recruitment and retention of students has been moved to the top of most universities' agendas by HEFCE due to its desire to increase the UK student population in line with Government targets. Poor retention rates have adverse funding consequences for institutions (Rowley, 2003).

2.2.4 Effects of having a cohort of satisfied students

Elliot and Shin (2002) discussed the positive effect that student's satisfaction plays on student's motivation, student's retention and recruiting efforts. HEIs should try to maximize students' satisfaction with their experience whilst they are at university and minimize dissatisfaction in order to improve their performance across a number of league tables, and so aid recruitment. Appleton-Knapp and Krentler (2006) suggest that students' satisfaction with their educational experience should be a desired outcome in addition to learning. Research by Blackmore et al. (2006) into student satisfaction found that even whilst satisfaction ratings overall were at an acceptable level, a significant number of respondents (many of whom were in their final year) claimed that they would not recommend their institution to others. Furthermore, Helgesen and Nesset (2007) conclude that the retainment of matriculated students is now just as important as attracting and enrolling new students. Some years later, in 2011, Venesaar, Ling and Voolaid argued that students' satisfaction s is related to recruitment, retention and academic success; and as a consequence, universities are focusing their attention on

creation of more supportive and attractive learning environments. As a result of the above, student satisfaction has become an extremely important issue for universities and their management.

Several researches have shown that there is a significant correlation among satisfaction level, customer loyalty, and profitability (Dutka, 1995; Naumann and Giel, 1995). Alves and Raposo (2007) proposed a conceptual model to examine the effects of students' satisfaction and stated the hypothesis that students' satisfaction results to loyalty. The results illustrated that students' satisfaction had a direct influence of 0.58 in loyalty and thus, satisfaction bred loyalty. The results are in accordance with Webb and Jagun (1997) and Eskildsen et al., (1999). Students who were satisfied were more loyal to the institution and were more likely to engage with alumni activities and maintain an ongoing relationship with their alma mater. As universities in many countries expend considerable effort and money on establishing a body of loyal graduates that may one day reward them with a financial return, this is clearly an important finding.

Keeping customers satisfied, or preferably, completely satisfied, leads to customer loyalty. Customer loyalty is discernible in many forms of customer behavior. Jones and Sasser (1995) suggested the following ways of measuring loyalty:

1) Customer intention to repurchase
2) Primary behavior - actual repurchasing behavior: retention, frequency, amount, longevity
3) Secondary behavior: customer referrals, endorsements and spreading the word

When translating this into university services, this includes intent to study at a higher level within the same institution, how frequently and recently a student used ancillary services, such as the library, catering and IT services, student retention, and lastly the willingness to recommend the institution to friends, neighbors and fellow employees (Blackmore et al., 2006).

2.2.5 Challenges in measuring students' satisfaction

The consumerist model of HE presents institutional managers and policy directors with many challenges, in order to re-define the role of a university in the modern consumerist era. Despite its almost ubiquitous position as a tool for university managers, the concept of "student satisfaction" remains ephemeral and surprisingly little is known about what makes a student satisfied with their experience of HE or how it can be measured effectively.

Senior, Moores and Burgess (2017), support that managers can no longer expect students to be satisfied with excellent teaching alone. In the new era students expect the provision of excellence with regards to professional skills that they can transfer to the post-graduation workforce and thereby harvest the economic and social benefits that attracted them to University study in the first place. There is also a need for a detailed and thorough statistical examination of the current means by which student satisfaction is measured across the HE sector. In the changing academic environment, current student satisfaction measures must be evaluated and restructured, in order to meet the emerging expectations of students and the developing roles of universities. Most important, there is a need to better understand the concept of student satisfaction and how this is driven by the increasingly important economic consequences that studying in HE has for students.

2.3 Main Concepts

Students' satisfaction and quality in education have been a theme of extended research due to their complex character. In order to better understand the relationship between students' satisfaction and quality in HE, the two concepts should be better analyzed.

2.3.1 The concept of students' satisfaction

Several satisfaction definitions exist in the services and consumer marketing literature. Satisfaction can be defined as pleasurable fulfillment, which means that consumers perceive that "*consumption fulfils some need, desire, goal, or so forth and that this fulfilment is pleasurable. Thus, satisfaction is the consumer's sense that consumption provides outcomes against a standard of pleasure versus displeasure*" (Oliver, 1999). By

referring to Oliver and DeSarbo's (1988) definition of satisfaction, Elliott and Shin (2002), describe student satisfaction as the favorability of a student's subjective evaluation of the various outcomes and experiences associated with education. Student satisfaction is being shaped continually by repeated experiences in campus life.

The still limited amount of research suggests that student satisfaction is a complex concept, consisting of several dimensions. Marzo-Navarro et al., (2005a, b), suggests students' satisfaction as a consistent of satisfaction with four variables named: the content of the major of study, social skills, methodological skills; and participation skills. Appleton-Knapp and Krentler, (2006) state that a variety of factors seem to influence student satisfaction and the factors fall into personal factors related to the student (gender, temperament, preferred learning styles and grade point average) and institutional factors related to the educational experience (instructor teaching style and quality of instruction). The satisfaction concept has also been extended recently to the context of higher education. Sinclaire (2011) indicated that student satisfaction in online learning was a combination of student success and having an enjoyable experience.

In their recent effort, Ahmed and Dar (2015) identified five business characteristics that were positively correlated with university satisfaction: consumer attributes; provider attributes; marketing activities; product attributes (such as quality of education); and symbolic attributes including institutional identity and reputation (Mourad *et al*., 2011).

2.3.2 The concept of quality in HE

In the growing literature on academic quality there is often extensive debate about the meaning of the term (Green 1994). Quality in HE is a complex and multifaceted concept and a single correct definition of quality is lacking (Harvey and Green, 1993) and therefore "*the best way to define and measure service quality*" (Clewes, 2003) does not exist yet. Grönroos (1982) introduced the results from the comparison of customer service expectations prior to receiving the service with their experience of the service, as perceived consumer's quality. Nitecki et al. (2000) defined service quality in terms of "*meeting or exceeding customer expectations, or as the difference between customer perceptions and expectations of service*". Based on findings in the service quality

literature, quality in education can be said to be determined by the extent to which students' needs and expectations can be satisfied.

As analyzed before, educational services have several service characteristics: they are predominately intangible, perishable, heterogeneous, and the professor's teaching efforts are simultaneously "produced" and "consumed" with both professor and student being part of the teaching experience (Shank et al., 1995). Due to these unique characteristics of services (Zeithaml et al., 1985), service quality cannot be measured objectively (Patterson and Johnson, 1993). Harvey and Green (1993) engaged a structural development of quality consisting of five dimensions: Quality as exceptional (linked to the idea of excellence), Quality as perfection or consistency (the processes and specifications are aimed to be perfectly met), Quality as fitness for purpose (meeting customer requirements), Quality as value for money (related to costs and thus, to accountability), Quality as transformation because education is not a service to the customer, but an ongoing process of transformation of the participant, suggesting that Quality as transformation can incorporate the other dimensions to some extent. A more recent model of quality management in HEI's, proposed by Mergen, Grant, and Widrick (2000) is based on three components: quality of design, quality of conformance and quality of performance.

Due to its complex character and consistency, many studies have been carried out indicating the significant importance of quality in HE. Although quality assurance schemes in European Higher Education were first introduced in France (1984), the UK (1985) and the Netherlands (1985) (Westerbeijden et al., 2007) it was first the Sorbonne declaration (1998) and then the Bologna declaration (1999) that addressed this issue at an international level by promoting the development of a coherent and cohesive European Higher Education Area by 2010. "The Bologna Process reflects enormous progress by creating a common degree structure and qualifications frameworks in order to bring uniformity and quality assurance across Europe while promoting transparency, mobility, employability and student- centered learning. Moreover in the Bergen ministerial meeting (Bergen, 2005) the standards and guidelines for quality assurance in the European Higher Education Area were adopted as proposed by the European Association for Quality Assurance in Higher Education (ENQA). Finally, in the Louvain meeting (April 2009), the European ministers

acknowledged the importance of quality assurance in every aspect of higher education. In all the above meetings the need to enhance quality in European Higher Education at institutional and national levels was stressed, driving thus universities around Europe to adopt external evaluation systems and also to apply for an ISO9001: 2000 certificate as a part of their internal quality management system (Hutyra, 2005).

Reduced public funding, global competition in the education sector, the freedom of students to choose the best attainable education they can receive, and the speed of information exchange have contributed to the awareness and implementation of education quality in higher education. Every stakeholder in higher education has its own view of quality due to particular demands. The challenge is to recognize and respond, in a balanced fashion, to these competing, and occasionally conflicting demands. This paper is concerned with one particular stakeholder in higher education: students.

Due to the introduction of tuition fees and the new degree structure, students are increasingly regarded as priority customers of educational activities (Marzo-Navarro et al., 2005a), receiving and using the training offered by the university. This view, however, does not mean that other perspectives may not be valid and important as well. Total quality management (TQM) - a new area of higher education Management, enables businesses to overcome global competition threats and improve their position. In terms of education quality evaluation, most people agree with the two approaches to assess education quality: mechanistic and humanistic. The mechanistic approach is conducted by experts and agencies during exercises such as the Research Assessment Exercise and the Quality Assurance Assessment. The humanistic approach focuses on the views of students.

2.3.3 Students' satisfaction vs. Quality

In examining the institutional drivers of student satisfaction, research found a significant relationship between satisfied students and the quality of the teaching with a mediating role for institutional reputation. A significant predictive relationship was also reported between satisfaction and intended post-graduation outcomes. Alves and Raposo (2007) examined the behaviors that effectively predicted student satisfaction and revealed that the quality of teaching experience was a key driver. Surprisingly, they

also found that institutional reputation was actually a more influential predictor of student satisfaction than teaching quality and thus, concluded that students are satisfied if they receive good teaching at a reputable institute.

It is by and large agreed that perceived service quality is a form of attitude related but not equivalent to customer satisfaction, although the relationship between the two has also been the cause of considerable debate within the raft of literature on the topic. Extended services literature suggests service quality and customer satisfaction as fundamentally different concepts. While quality is a general attitude, satisfaction is linked to particular transactions (Patterson and Johnson, 1993; Rowley, 1997; Aldridge and Rowley, 1998; Robinson, 1999). There are, however, conceptual issues in literature concerning the sequential order of the two constructs. While authors such as Dabholkar et al. (2000); Cronin et al. (2000); and Farrell et al. (2001) regard perceived quality as an antecedent to satisfaction, other authors (e.g. Parasuraman et al., 1988; Bitner, 1990), however, consider customer satisfaction as an antecedent to service quality. Farrell et al. (2001) give a good overview of this contentious conceptual issue.

The majority of recent publications (e.g. Yavas et al. 2004; Carrillat et al. 2007; Zeithaml et al. 2008) consider service quality as an antecedent to customer satisfaction. In particular, Zeithaml et al. (2008), who point out that service quality and customer satisfaction, are fundamentally different concepts, regard satisfaction as the broader concept with service quality being a component of satisfaction will be taken as a framework. They suppose that customer satisfaction is influenced not only by service quality perceptions but also by personal and situational factors and price. Further support can be found in the higher education literature: Browne et al. (1998) and Guolla (1999) show that students' perceived service quality is an antecedent to student satisfaction.

Cronin and Taylor (1992) argued that the distinction between satisfaction and quality is important because service providers need to know whether their objective should be to deliver satisfied customers, who will then develop a perception of high service quality, or that they should aim for high service quality as a way of increasing customer satisfaction. This relationship is given further importance, as one of the aims of service providers is surely to also engender customer loyalty in order to at best increase wealth

or at least maintain their place in the market place. Hill (1995) stated that perceived HE service quality could be the product of a number of service encounter evaluations by students. Such encounters would be with administrators, teaching staff and managers as well as other HE employees. Hill (1995) recognized that because of limited resources within HE individual attention to students may be limited. This makes the focusing of resources on the critical areas more significant. However, given the continuing growth of HEIs within the UK competition is becoming even more of an issue since Cuthbert (1996) over a decade ago posited that there was real competition between institutions. He proposed that there should be a specific instrument devised for the evaluation of service quality within HE that was beyond the more traditional questionnaires.

As the students' expectations determine the outcome of satisfaction, some emphasis has been placed on understanding the formation of expectations. Zeithaml et al. (1990) suggested that word-of-mouth communications, personal needs, past experience of the service, external communications and price can influence the consumer's expectations. Many institutions attempt to measure student satisfaction internally using student evaluation and feedback surveys to assess their quality delivery. The results have established relationships between expectations and the level of satisfaction of the service received. From the student's point of view, good quality education provides better learning opportunities and it has been suggested that the levels of satisfaction or dissatisfaction strongly affect the student's success or failure of learning (Aldridge and Rowley 1998). Consequently, both share similar views on students' learning.

Chapter 3
Previous research on students' satisfaction

Over the years, extended research was conducted to examine the reasons for student's satisfaction or dissatisfaction with their HE experience. The term "academic experience" connotes experience with teachers, classes etc. in students' evaluation of their overall academic experience. However, it is also influenced by experiences with other aspects of university life such as administrative practices and staff, physical characteristics of academic facilities, social environment and advising support (DeShields et al., 2005; LeBlanc and Nguyen, 1997; Sohail and Shaikh, 2004; Thomas and Galambos, 2004). The student satisfaction literature includes a variety of research in response to universities' concerns about the quality of their programs and students' perceptions of their academic experience. These studies encompass many different types of student bodies and multiple approaches to measuring satisfaction.

3.1 Multiple models

Multiple approaches were applied and different models were developed to measure students' satisfaction with HEIs. Several studies to measure students' satisfaction are presented below:

3.1.1 The model of Douglas, McClelland and Davies (2008)

The research aims to develop a conceptual model of the Critical Incident Technique (CIT) that can be utilized within an HE context, based on the identification of the variable determinants of student perceived quality and the impact of those variables on student satisfaction. Furthermore, the paper intents to identify the determinants that most likely have either a positive or negative impact on student loyalty behaviors.

CIT (Flanagan, 1954), as a method, gathers "free text" expressions. It was used by researchers outside of the HE sector (Cadotte and Turgeon, 1988; Douglas Hoffman et al., 2003; Johnston, 1995) and has been used with students only to gather data on matters outside the HE context. Although student feedback within the HE sector is usually assessed using questionnaires based on predetermined questions, this study applies the CIT method to allow respondents to freely express their feelings on particular incidents, without being constrained to specific areas. These incidents were distinguished between teaching, learning and assessment; and ancillary services. The design of this CIT questionnaire was based on the work of Edvardsson and Nilsson-Wittell (2004), which found that not all incidents were critically critical, i.e. would lead to a change in loyalty behavior.

The study analyzed the answers of 163 undergraduate students among Faculty of Business and Law students, at Liverpool John Moores University in the UK. The students were asked to describe four specific situations where they recalled a positive experience with teaching, learning and assessment, and with ancillary services; and a negative experience with both categories, during their course of study. A total of 517 anecdotes, characterized as positive or negative were returned. A qualitative data analysis software package (Nvivo) was used to identify the service quality determinants, and SPSSv13 was introduced to enter the demographic data and loyalty intentions.

Conclusions:

Although a number of determinants were identified, only very few were likely to lead to a change in behavior. The main sources of dissatisfaction were attitude, responsiveness, tangibles, team work, communication, management, access and socializing. Within the area of teaching, learning and assessment, functionality/usefulness is a major satisfier and thus, its presence leads to satisfaction but absence doesn't lead to dissatisfaction. The "critically critical" determinants are identified to be communication and responsiveness within the teaching, learning and assessment environment; and access and responsiveness within the ancillary services environment. The significant effects, both in teaching, learning and assessment and ancillary provision were mainly caused by the intangible aspects of the service provision.

Critical review:

There are a number of limitations with this study. The sample size was relatively small and involved only one Faculty within one University. It remains to be seen if a larger study will confirm the findings of this study. It is also assumed that the statements made in relation to the loyalty behaviors would be acted upon, for example, not attending lectures or tutorials, not re-enrolling for the next year of study, or not recommending the course or university to friends. The study is based on the respondents' recollection of past events and it is assumed that these were accurate. However, this limitation is common to other forms of data collection.

3.1.2 The model of Gruber, Fuß, Voss and Gläser-Zikuda (2010)

The study was conducted at a University of education in Germany, in a period that country's highest court allowed the introduction of fees for German universities; and HEIs were focusing on meeting their students' needs. The first phase acted as a pilot study and was conducted in the winter term 2005/06; and the main study was then conducted a year later. The study was published on 2010, presenting students' perception of the offered services at a German university and how satisfied they are with these offerings.

A new measurement tool was developed to measure most aspects of student life, as many existing surveys are poorly designed, lack standardization and give no evidence concerning reliability or validity. Questionnaires were handed out in eight lectures for the pilot study and 18 lectures for the main study. The response rate was 99 percent. A total of 374 students (pilot study) and 544 students (main study) filled in the newly developed questionnaires using Likert scales.

The dimensions measure, were based on literature review, following recommendations by Harvey (2003):

- administrative and student services
- atmosphere among students
- attractiveness of the surrounding city
- computer equipment

- courses
- library
- lecturers
- lecture theatres
- refectory/cafeteria
- relevance of teaching to practice
- university's reputation
- school placements
- support from lecturers
- the presentation of information
- university buildings

Additionally, the general satisfaction with the university was measured in the questionnaire. The following items, covering different aspects of the satisfaction construct were used for all 15 quality dimensions and the general satisfaction with the university:

- The . . . fulfill my expectations.
- The . . . are just how I would like them to be.
- I am satisfied with the . . .
- I would recommend the . . . to others.

Conclusions:

The relative stable results of both studies, supports the assumption that students' satisfaction with their university is based on a relatively stable person-environment relationship. Thus, the satisfaction of students seems to reflect quite well perceived quality differences of offered services and of the wider environment. Students appear to be particularly satisfied with the school placements and the atmosphere among students and mostly dissatisfied with the university buildings and the quality of the lecture theatres.

Critical review:

The study was the first to successfully apply a newly established measurement tool that could provide considerable further benefits for future studies. As the study involved

only two samples of students from one university, the results cannot be generalized to the German student population as a whole. Moreover, the independent variables explain 50% of the variance, indicating that important factors explaining students' satisfaction are missing.

3.1.3 The model of Harvey, Parahoo and Santally (2017)

Not like the majority of student satisfaction studies undertaken in Western contexts, those done in other cultural contexts have usually focused on overall satisfaction and not considered gender differences, making the findings difficult to generalize due to cultural differences (Parahoo *et al*., 2015). The study was conducted in Mauritius, to identify whether the expectations of "millennials" from online learning are different than previous studies or vary across gender. "Millennials" are people born between 1982 and 2000, have grown up using technology and '*have characteristics unique to the digital age*' (Northern Illinois University, 2013).

A mixed method design was implemented with a qualitative approach at the first stage, to support the development of the conceptual model and the constructs. Two focus groups were held with undergraduate students enrolled at the university. Participants described their perceptions of factors that influenced their satisfaction and shared their feelings and thoughts with other participants. The pilot instrument consisted of 29 items representing the seven identified constructs:

- interactions with and feedback from instructor
- effective and meaningful interactions with other students
- IT staff support
- support from administrative staff
- instructor's classroom engagement and competence in using technological tools
- quality of physical infrastructure of the university
- university reputation

This pilot study resulted in minor item refinement and the final study questionnaire. The survey was then given to students enrolled in the online course: 'General Education Module in Educational Technology'. The survey was administered online at the conclusion of the course for purposes of convenience and anonymity, resulting in 834

usable responses (a 90% response rate). The data were then analyzed in a multi-stage process.

An exploratory factor analysis (EFA) was undertaken to categorize the distinct factors involved and the resulting factor structure was then validated and purified by confirmatory factor analysis (CFA). Composite reliability (CR) was assessed to determine the internal consistency of the various study scales. Face, convergent and discriminant validity were also assessed. At the end of the scale construction stage, the study hypotheses were tested by structural equation modeling (SEM) using linear structural relations (LISREL). The assumptions underlying EFA were confirmed through the Kaiser–Meyer–Olkin measure of sampling adequacy (= 0.930) and Bartlett's test of sphericity (p<0.001). The measurement models were separately tested across both genders.

Conclusion:

While various studies have resulted in conflicting results, the findings from this study indicate no gender differences, in regards to students' satisfaction in the online class environment among "millennials". Furthermore, reputation and physical infrastructure are the primary determinants of student satisfaction followed by instructor empathy and interactions.

The findings in Mauritius tend to be similar to recent ones in the US and Western Europe indicating that gender differences as to antecedents of online satisfaction are not significant (Chitkushev *et al*., 2014; Cole *et al*., 2014) in multi-ethnic settings where male and female gender roles are not as culturally embedded. However, there appears to be a need to better understand and measure culturally embedded gender differences and how these impact student satisfaction, especially in patriarchal societies. In contrast to findings by Howell and Buck (2012) who found that instructor subject matter competency was impacting student satisfaction, this study found that the academic credentials of the instructor did not emerge as a factor affecting students' satisfaction. This may be due to a combination of reasons: students took for granted that instructors appointed by the university would be qualified; the difference between traditional older

students and those of “millennials”; or that the students relied more on course materials to learn autonomously.

Critical review:

The present study was conducted in a specific empirical context (a university in a multi-ethnic country so the influence of culturally embedded gender influences would be mitigated) and the findings cannot be extended to different cultural contexts.

3.1.4 Conclusions on multiple models

Mixed methodologies were used to assess student’s satisfaction. In order to identify the constructs and develop the model, researchers applied methods such as the Critical Incident Technique (CIT) in alignment to qualitative data analysis packages (Nvivo). SERVPERF was used to measure service quality and HE performance was evaluated using HEdPERF. SPSS was used to enter group characteristics and multiple regression analysis was also applied. Table 1 presents the quality determinants identified to affect students’ satisfaction.

Table 1. Determinants of students’ satisfaction: Multiple models.

	Determinants of quality	**Determinants of satisfaction**
Douglas, McClelland and Davies (2008)	Access/availability	**x**
	Aesthetics	
	Attitude	**x**
	Comfort	
	Commitment	
	Communication	**x**
	Competence	
	Courtesy	
	Credibility/integrity	
	Flexibility	
	Friendliness	**x**
	Team work	**x**
	Management	**x**
	Motivation	**x**
	Reliability	
	Responsiveness	**x**
	Security	
	Socialising	**x**
	Tangibles/cleanliness/tidiness	**x**

	Understanding/knowing the customer	
	Functionality/usefulness	**x**
	Virtual resources	
Gruber, Fuß, Voss and Gläser-Zikuda (2010)	Administrative and student services	
	Atmosphere among students	
	Attractiveness of the surrounding city	
	Computer equipment	
	Courses	**x**
	Library	
	Lecturers	
	Lecture theatres	**x**
	Refectory/cafeteria	
	Relevance of teaching to practice	**x**
	Reputation of the university	**x**
	School placements	
	Support from lecturers	
	Presentation of information	
	University buildings	
	General satisfaction with the university	
Harvey, Parahoo and Santally (2017)	University Reputation	**x**
	Physical infrastructure/facilities	**x**
	Instructor empathy	**x**
	IT/admin staff interactions	**x**
	Student interactions	
	Instructor feedback	

3.1.5 Measuring business student satisfaction: A review and summary of the major predictors, Gibson (2010)

In a review of previous studies using linear regression models, the author attempts to summarize the determinants that most influence students' perceptions of overall satisfaction. Particular emphasis is on business students' satisfaction, although they may have different expectations than the wider university student body.

<u>Linear regression models:</u>

Linear regression models were often used to identify the best predictors of dependent variable (satisfaction), using all possible independent variables. Since some variables are usually strongly correlated with each other, data reduction techniques such as factor analysis are included. One difficulty in comparing study results is that not all studies

include the same variables, or they may include similar variables with very different names.

Conclusions:

The predictor variables cited the most, as presented in table 2, are considered as the most important to student perceptions of overall satisfaction. The primary 'satisfiers' appear to be variables associated with learning and outcomes (Douglas et al., 2008; Elliot and Shin, 2002). The attributes of the academic program itself are most important to students' overall satisfaction. These attributes, include the quality of teaching and the classes/curriculum as well as the skills developed and career goals.

Although there are mixed conclusions about the importance of the physical aspects of service provisioning, the availability and quality of services/facilities, such as IT support and advising, are usually characterized as 'dissatisfier', i.e., negative perceptions of services/facilities may lead to dissatisfaction, but positive perceptions do not necessarily lead to overall satisfaction. The responsiveness of both academic and services personnel, however, is important. Non-academic variables, such as the degree of student centeredness/responsiveness and the degree of social integration experienced by the student, particularly important in larger institutions, often appear to be the cause of dissatisfaction, i.e., positive perceptions are not as important to overall satisfaction as positive perceptions of academic variables, but negative perceptions may result in dissatisfaction with the overall academic experience. Advising support also appears as 'dissatisfier', and pre-enrolment factors, although important, provide an area for further study.

A potential limitation of this research is that the results may vary according to type of student body. The study could also be widened to include comparisons to studies that do not use regression analysis.

Table 2. Students' satisfaction determinants: Gibson (2010).

Students' satisfaction determinants
Academic staff/teaching
Classes/curriculum
Advising support
Skills developed
Preparation for future
Services/facilities
Social integration
Student centeredness/ Responsiveness
Pre-enrolment factors

3.2 The SERVQUAL methodology

SERVQUAL (Parasuraman, Zeithaml, and Berry, 1985) has been used extensively in the service literature over time, and to date is one of the most established conceptual models to determine customer satisfaction in services (Lupo, 2013). The SERVQUAL model in its original formulation consists of 22 statements measuring the perceived quality of the service from the perspective of 5 critical dimensions of service quality namely tangibility, reliability, responsiveness, assurance, and empathy. Tangibility refers to the appearance of physical facilities, equipment, personnel, and communication materials; reliability to the ability to perform the promised service accurately and dependably; responsiveness to willingness to assist customers and provide prompt service; assurance to the knowledge and courtesy of employees and their ability to convey trust and confidence; and empathy to the caring; and individualized attention given to customers.

The theoretical principle is the discrepancy or gap theory: the difference between service perceptions and expectations, weighted by the importance assigned to each service dimension, represents a manifest variable of the service performance. Positive gap scores indicate satisfaction or a positive perception of the product or service consumed. Negative gap scores imply that there was dissatisfaction. The required data for the assessment of service quality through the SERVQUAL model are quantitative in nature which can be expressed in terms of exact numbers by linguistic-numerical evaluation scales.

Both sets of items are operationalised using a 7-point bi-polar scale labeled, Strongly Agree (7) to Strongly Disagree (1). The quality of service is assessed through this SERVQUAL score, called the gap score computed by taking the difference for scales and then averaged over the number of items either in the total scale or for each subscale (Bearden and Netemeyer, 1999). According to the authors, the service quality is then the difference between customers' perceptions and expectations (P-E) and is given by the following equation.

$$Q = \frac{1}{22} \sum_{i=1}^{22} (P_i - E_i)$$

Where

Q = Perceived service quality
Pi = Performance level perceived on attribute i for the delivered service,
Ei = Expected performance level on attribute i for the service generally.
22 represent the number of questions used.

In studies of educational service quality, SERVQUAL is used to identify the factors that influence students' perceptions of service quality, recognizing that overall student satisfaction maybe influenced by more than academic quality.

Studies using the SERVQUAL methodology are presented above:

3.2.1 The model of Kay C. Tan and Sei W. Kek (2004)

Tan and Kek (2004) presented an enhanced SERVQUAL approach for measuring student satisfaction. The survey, including 76 service quality areas, was administered electronically in 2002 and targeted engineering students from two local Universities in Singapore. The research was executed in the USA.

The main purpose of the survey was to validate service quality gaps and identify areas of priority. Service quality gap scores are obtained by subtracting the expectation scores from the perception scores. The results of the survey indicate a range of predominantly

negative service quality gaps at both universities. Several factors scored closer to the students' expectations. Results show that the engineering students at both universities expected a higher level of service with regards to the availability of channels for conveying their ideas to management and the willingness of the universities to consider their opinions.

Given that the expectation of service level is co-related with the level of importance rating, SERVQUAL's results were also interpreted using the satisfaction grid, to portray the areas of large negative service gaps that are in dire need of attention. The satisfaction grid analysis revealed that the attributes of advising and communication at both universities warranted high attention for action. It was commendable that the attribute of cleanliness of facilities scored high for both universities. For this study, the use of the satisfaction gird in conjunction with SERVQUAL adds value to obtaining gap scores as opposed to obtaining only performance scores, as SERVPERF does. SERVPERF (Cronin and Taylor, 1992) is a model where only service perceptions represent manifest variables of the service performance.

3.2.2 The model of Li-Wei Mai (2005)

Li-Wei Mai (2005) conducted a comparative study between UK and US students, in order to examine if there are any significant differences in their satisfaction levels, and to identify the factors which influence students' levels of satisfaction. The extent of globalization in education should be viewed from two principal elements, one based on students and the other on education providers.

For the study purposes, 322 US and UK postgraduate business school students were asked about their satisfaction with their education, compared with their expectations with respect to various quality aspects. A survey was conducted to compare postgraduate business school students' perceptions of the education they receive in the two countries. A questionnaire was designed to quantify the perceptions, measured against their expectations of the service, based on the framework of SERVQUAL. The questionnaires were coded and processed using SPSS.

A set of 19 independent variables reflecting various aspects of education services were measured against students' expectations. A five-point rating scale was attached, with

'Much better than I expected' = 5, and 'Much worse than I expected' = 1. The reliability test was applied to test the internal consistency and reliability of the data. The data from the 20 variables generated an Alpha value of 0.85, which is considered very satisfactory.

Conclusions:

The results indicated that although students in both countries are satisfied with the education, students who studied in the US expressed higher levels of satisfaction, concluding to the existence of significant differences between UK and US education perceived by students.

The two most influential variables in predicting students' satisfaction were found to be 'overall impression of the school' and 'overall impression of the quality of education'. Lecturers' expertise, IT facilities' quality and accessibility and the furthering careers prospects were significantly correlated with the overall impression of education quality. The quality delivered by the teaching staff is still viewed as an essential element in quality perception and satisfaction. Nevertheless, the overseas students expressed significantly lower levels of satisfaction compared with domestic students.

Based on the service quality theory, the author suggests that satisfaction is a result of the perception of service quality and thus, the US provides better quality of education than the UK. However, the assumption of different expectations, are not substantiated in this study as students usually choose the best attainable university based on their ability, and subsequently the expectations are formed. It is also difficult to evaluate the influence of the cultural factor to the results and therefore, further research is needed.

3.2.3 The model of Arambewela and Hall (2006)

The authors attempt to examine the relationship between the SERVQUAL constructs proposed by Parasuraman et al (1988, 1985) and the country of origin and satisfaction among four cohorts of Asian international postgraduate students studying in Australian universities.

The data used were derived from a mail survey conducted among international postgraduate students from China, India, Indonesia and Thailand studying in five

universities in Victoria, Australia. An adapted SERVQUAL version was designed to collect the data and to measure the gap between student responses on expectations and perceptions of the university on a seven point scale. Thirty-six statements representing aspects of the operations and services of the university were used.

Scales were developed to investigate this relationship between SERVQUAL constructs of reliability, responsiveness, assurance, empathy and tangibles; and were shown to be reliable. Using ANOVA and MANOVA techniques, significant differences between country of origin and the SERVQUAL constructs were discovered. Even though there were variances in the impact of each construct, all SERVQUAL constructs had an impact on student satisfaction. However, the tangibles construct was the most significant in forming satisfaction among all groups of students, coming to alignment with previous studies on student satisfaction (Smith, Morey, and Teece, 2002; Le Blanc and Nha, 1997; Wakefield and Blodgett, 1996). The study revealed that the importance placed on individual service quality variables within each construct also differed between the four groups of students, providing an insight into the post-choice behavior of students. As a result, the findings could be used from HEIs in prioritizing action to achieve desired satisfaction levels of students.

Therefore, the authors suggest that the development of a segmented approach in targeting services to students from different countries focusing on the most important service quality variables should be part of the organizational strategy to improve student satisfaction. The success of such an approach will depend on the organizational appreciation of the cultural diversity and the commitment to quality in service delivery. This study also highlighted an important issue of high student expectations which was shared by all groups of students included in the study.

The major limitation of the study is its scope which was restricted to five universities in the state of Victoria, Australia. The generalization of the results becomes an issue in this context. It can also be argued that the issues identified in the study seem to have a common appeal and therefore would be applicable to international students in any study destination.

3.2.4 The model of Lupo (2013)

According to a recent development of the SERVQUAL model (Curry, 1999; Luk and Layton, 2002), the three main Gaps associated with customer satisfaction are:

- Gap 1: customers' expectations and management's perceptions of service quality
- Gap 6: customers' expectations and employees' perceptions of service quality
- Gap 5: customers' expectations and their perceptions

and they are evaluated with relation to critical to quality service criteria and sub-criteria.

Gap 5 values reflect the result of the influences exerted from the customer side and the shortfalls (Gaps) on the part of the service provider and therefore such values can be considered as direct indicators of the customer satisfaction degree. Therefore, customers' dissatisfaction is collected for the service aspects in which a negative value of the Gap 5 is obtained.

A recent research presented by Lupo (2013), uses the above extension of the SERVQUAL model in combined manner with the Fuzzy Set Theory and the Analytic Hierarchy Process (AHP) method. In particular, the Fuzzy Set Theory is considered to deal with such uncertainty, whereas the AHP method is adopted as tool to estimate the importance weights of the strategic service attributes.

The application of such method has been shown in a strategic education services performance analysis related to the Management Engineering program of the University of Palermo (Italy). The students' satisfaction survey has been conducted for three months, between February and April 2013, and about 200 students and a total number of 20 respondents between services decision makers, i.e. the professors' staff that manages course activities, and professors have been interviewed. The main criteria under consideration were academic staff, infrastructures, equipment and support services, each separated into sub-criteria consisting of several service items each.

Conclusions:

From such analysis, the service main Gaps have been evaluated and a suitable ‘‘Gaps oriented’’ strategy for the overall service quality improvement has been identified. The service criteria Academic staff and Equipments, and, in particular, the service items Frequency of exams sessions, Suitability of student support equipment, Suitability of teaching aids and Design of course structure based on job requirements, should be taken into account.

Moreover, the effects of the discrepancies between students’ expectations and management’s perceptions of service quality (Gap 1) and students’ expectations and professors’ perceptions of service quality (Gap 6) on the student satisfaction level (Gap 5) have been investigated and quantified by means of a regression model.

3.2.5 Conclusion on the above SERVQUAL models

Surveys of service attributes were classified into factors and factor analysis was used to validate the gap scores. SPSS was used, to code and process questionnaires. In comparative studies, ANOVA and MANOVA techniques were used to identify significant differences between groups. Stepwise regression analysis was used on overall satisfaction. A fuzzy SERVQUAL based method for reliable measurements of education quality was also applied. Table 3 presents the quality determinants of SERVQUAL studies, identified to affect students’ satisfaction.

Table 3. Students’ satisfaction determinants – SERVQUAL methodology.

	Determinants of quality	**Determinants of satisfaction**
Kay C. Tan and Sei W. Kek (2004)	Course	
	Assessment	
	Workload	
	Learning	
	Teaching and advising	**x**
	Communicating with the university’s management	**x**
	University facilities	
	Social activities	

Li-Wei Mai (2005)	Lectures' expertise in their subject area	
	Lecturers' interest in subject matter	
	Overall impression of the school	**x**
	Overall impression of the quality of education	**x**
	Quality & accessibility of IT facilities	
	Prospect of this degree furthering my career	
	Quality delivered by teaching staff	**x**
Arambewela and Hall (2006)	Reliability	**x**
	Responsiveness	**x**
	Assurance	**x**
	Empathy	**x**
	Tangibles	**x**
Lupo (2013)	Academic staff	**x**
	Infrastructure	**x**
	Equipment	**x**
	Support services	**x**

3.2.6 Critical analysis on SERVQUAL methodology

The practical application of the measurement approach to different service settings is as considered as a major strength of SERVQUAL over other measures. The SERVQUAL scale is also regarded to be reliable and valid in comparing customers' expectations and perceptions over time or comparing own SERVQUAL scores against competitors. It is also applicable to measure in segmenting customers into several perceived quality segments, using demographic, psychographic and other profiles; and for example characterizing as "high", "medium" and "low". Other advantages of the model are been identified to be the relative importance of the five dimensions in influencing service quality perceptions and the practical implications for companies to improve the global perception of its service quality as Llosa et al. argue (1998).

It has been demonstrated that the variables that best predict overall satisfaction may differ from those that best predict other measures of satisfaction. The so-called SERVQUAL factors tend to be the best predictors of satisfaction with academic quality, but a broader range of variables is generally associated with overall satisfaction. As cited by Thomas and Galambos (2004), aspects that are found to be more important for students who are less academically engaged, are frequently cited in SERVQUAL studies.

Following Watson et al. (2002), given that the expectation of service level is co-related with the level of importance rating, SERVQUAL's results can also be interpreted using the satisfaction grid. Based on both the satisfaction ratings as well as the importance ratings, SERVQUAL's results can also drive decision making. It is also observed that SERVQUAL studies, whose primary objective is to assess student perceptions of educational quality, define predictors that differ markedly from the terms used in non-SERVQUAL studies to describe predictors of overall satisfaction.

Despite its popularity, SERVQUAL is criticized on its operational and measurement problems. Instead, Cronin and Taylor (1994) recommended a performance-based measure that they called SERVPERF, arguing that expectations should not be included when measuring service quality, even though they can lead to valuable conclusions when conceptualized properly. Babakus and Boller (1992) come to the same conclusion suggesting that the expectation portion adds no additional information to the information obtained from performance perceptions only. Arguments also refer to the type of expectations (eg. desired or adequate), which would provide different satisfaction responses (Swan and Tranwick, 1981), the link between customer satisfaction and service quality (Cronin and Taylor, 1994; Teas, 1993) and the number and nature of the dimensions being inappropriate for some service industries such as product services and "pure" services (Llosa et al, 1998). Since HE is thoroughly considered as a service, all that suggestions should be considered in assessing HEI's student's satisfaction.

Parasuraman et al. responded to these criticisms by introducing some adjustments to the scale and its operation (1994). They argued that although the practice of measuring perceptions only is widespread to determine service quality, such a practice does not necessarily support the superiority of a performance based measure. They acknowledge

that customer expectations have more diagnostic value. Regarding to the causal relationship between customer satisfaction and service quality, they consider service quality as an antecedent of customer satisfaction, using recent research evidence. In regard to this type of comparison standard for measuring service quality, it is argued that the issue of comparison norms and their interpretation still remains unresolved and is being examined by many researchers.

Further, many criticism on SERVQUAL is associated to the employment of the model. Some difficulties are related to the use of linguistic-evaluation scales: the well-documented tendency of respondents to select central linguistic categories to express judgments, influence of the linguistic categories number in the evaluation process, the form and the type of the adopted linguistic variables and, finally, the transformation from cardinal to metric data. Other critical factors are related difficulties arising from the use of differential psychometric score (Brown, Churchill and Peter, 1993; Peter, Brown and Churchill, 1993).

3.3 The MUSA methodology

The preference disaggregation MUSA (MUlticriteria Satisfaction Analysis) method used for data analysis and interpretation is based on the principles of multicriteria modeling. It is an ordinal regression based approach (Jacquet-Lagrèze and Siskos, 1982; Siskos, 1985; Siskos and Yannacopoulos, 1985) proposed by Grigoroudis and Siskos (2002).

The method is used for the assessment of a set of marginal satisfaction functions in a way that the global satisfaction criterion becomes as consistent as possible with customer's judgements. The main objective of the method is the aggregation of individual judgements into a collective value function.

The MUSA method assesses global and partial satisfaction functions Y^* and X_i^* respectively, given customers' judgements Y and X_i (for the i-th criterion). The ordinal regression analysis equation has the following form:

$$Y^* = \sum_{i=1}^{n} b_i \, X_i^*$$

$$\sum_{i=1}^{n} b_i = 1$$

where the value functions Y^* and X_i^* are normalised in the interval [0,100], n is the number of criteria, and b_i is a positive weight of the i-th criterion.

The method infers an additive collective value function Y^* and a set of partial satisfaction functions X_i^* . The main objective of the method is to achieve the maximum consistency between the value function Y^* and the customers' judgements Y.

Furthermore, the MUSA methodology provides not only the satisfaction degrees estimated for the criteria and sub-criteria stated above, but also provides a set of normalized indices and diagrams (Grigoroudis and Siskos, 2002) that may enhance the levels of the satisfaction analysis and link the results with actions that should be taken in order to improve the department's overall performance. Consequently the indices and diagrams that are obtained from the analysis are as follows:

Satisfaction indices: these are average indices in the 0 - 1 interval and they reflect the student's global or criteria satisfaction.
Demanding indices: they are normalized indices in the [−1, 1] interval and reveal the student's global or criteria demanding level.
Improvement indices: they are normalized indices in the [0, 1] interval and display the improvement margins on a specific criterion.
Action diagrams: they are diagrams similar to the ones of the SWOT analysis and are obtained from the combinations of criteria weights and satisfaction indices.
Improvement diagrams: they are diagrams obtained from the combinations of demanding and improvement indices and may be used to rank improvement priorities.

Several applications of the method in original customer satisfaction surveys can be found in Grigoroudis *et al*. (1999a, 1999b), Mihelis *et al*. (2001), and Siskos *et al*. (2001). Some models applying the MUSA methodology in higher education follow.

3.3.1 The model of Siskos and Grigoroudis (2002)

This application of the MUSA method refers to a public and business administration department. The main set of students' satisfaction criteria used in this particular survey consists of Academic personnel, Educational process, Syllabus, Labor market (vocational rehabilitation), Administration, and Additional services such as library, labs etc.

Global satisfaction results presented the average global satisfaction to be relatively low (61%), mainly because students were not satisfied from the opportunities offered to the labor market (26%), the syllabus (26%), and the provided administrative service (39%). Students seem to be quite satisfied with regards to the criterion of educational process (83%), which is also the most important satisfaction dimension (weight 29%). The rest of the criteria appear to have significant improvement margins, although they have higher satisfaction indices (72-77%) compared to the global satisfaction level. Additionally, the form of the global satisfaction function indicates that students are not particularly demanding.

Segmentation satisfaction analysis was performed to determine students' clusters with distinctive preferences and expectations in relation to the total set, using the variables of students': "year of studies", "sector of studies", and "average grades". The most important distinctive results relate to the segmentation according to the year of studies. The results reveal the following:

The satisfaction level of the 1st year students is the highest to almost all of the criteria. 1st and 2nd year students are less demanding, and thus, they have relatively higher average satisfaction index. Globally, 3rd and 4th year students are very dissatisfied from the university department. The academic personnel, the syllabus, and the provided administrative and additional services have the lowest satisfaction level for 3rd and 4th year students. That shows that as students are closer to graduate, they seem to be more demanding at these particular satisfaction dimensions.

The above findings were explained by the way the course of studies is implemented. First year students are basically taught elementary subjects (mathematics, sociology, etc), while at the beginning of the 3rd year, they have to choose the sector of studies they will follow. This will affect in great extent all of their next choices.

As a result of the application of the MUSA method in segmentation analysis, the fitting and the stability level of the results may vary, causing a problem of "inconsistency" when trying to compare global with segmentation analysis results. In this particular application, the global set is less homogenous than the students' segments.

3.3.2 The model of Dimas, Goula and Pierrakos (2011)

Based on MUSA, some 9 years later, Dimas, Goula and Pierrakos, conducted a detailed analysis of a student satisfaction survey at the Health Care Management Department of the Technological Education Institute of Athens, for the spring semester 2010. The method assumes that customer's global satisfaction can be explained by a set of criteria representing the service's distinctive dimensions. Those criteria consist of Program of Study, Academic Staff, Tangibles (Equipment), Administrative Services; and Image-Fame**.** The first step comprises the design and the development of a questionnaire as well as the accomplishment of the research. A statistical analysis was performed to determine the variations obtained among the student's judgments.

The research shows a quite high mean global student satisfaction (83.7%) suggesting though marginal improvements. The results confirm the significance of analyzing student satisfaction and the implications assigned to specific quality dimensions of HE. For instance it is really interesting to see the importance attached in individual criteria that compose global satisfaction and also consider the demanding level students display to those criteria.

Based in the results, the criterion Image-Fame of the Department is considered of high importance, which probably reflects the overall quality and reliability. The criteria Program study, Academic Staff, Administrative Services and Tangibles (Equipment) are considered of low importance. Moreover, combining the estimated satisfaction indexes and weight factors for the criteria, improvement diagrams were produced indicating the dimensions to be improved in order to increase the global satisfaction.

Based on satisfaction analysis results, the Department should work out a middle term plan to preserve the satisfaction levels of the strong points while increasing the satisfaction of the weak points. A supplemental result to draw attention is that students appear to be neutral or non-demanding to all criteria and sub-criteria.

3.3.3 Conclusions on the above MUSA models

The variables identified through applications of the MUSA methodology are presented in table 4. Applications provide evidence that those variables are determinants of HE service quality and students' satisfaction.

Table 4. Students' satisfaction determinants - MUSA methodology.

	Determinants of quality	**Determinants of satisfaction**
Siskos and Grigoroudis (2002)	Academic personnel	**x**
	Educational process	**x**
	Syllabus	**x**
	Labor market	**x**
	Administration	**x**
	Additional services	**x**
Dimas, Goula and Pierrakos (2011)	Program study	**x**
	Academic personnel	**x**
	Tangibles (equipment)	**x**
	Administrative services	**x**
	Image-fame	**x**

3.3.4 Critical analysis on MUSA methodology

The applications show that the MUSA method can measure and analyze student's satisfaction in a very concrete way, and thus it may be integrated in HEIs' total quality approach. Results of original applications of the preference disaggregation MUSA method in several HEIs include the determination of the weak and the strong points of the HEI as a product of student's judgment, and the performance evaluation of the HEI, globally and per criteria/sub-criteria. Segmentation satisfaction analysis leads to the identification of students' clusters with distinctive preferences and expectations in relation to the total set.

Furthermore, MUSA methodology provides a set of normalized indices and diagrams (Grigoroudis and Siskos, 2002) to be used to improve the levels of the satisfaction analysis. The diagrams can give directions to align the results with actions to improve the department's overall performance. Those diagrams include Improvement indices, Action diagrams and Improvement diagrams. Action diagrams, also known as performance-importance maps may determine the weak and strong points of student's satisfaction as well as the actions to be undertaken to improve the overall satisfaction. These diagrams are composed of four quadrants depending on the performance (satisfaction indices) and the importance (weights) of the criteria (Grigoroudis and Siskos, 2002).

The installation of a permanent customer satisfaction barometer allows the establishment of a benchmarking system (Edosomwan, 1993). The implementation of the MUSA method through a period of time can serve the concept of continuous improvement. Using MUSA methodology on a regular overtime basis may provide valuable insights into changes and trends regarding student's satisfaction and its constituent dimensions. A straightforward consequence from the above considerations could possibly be the adaption of a satisfaction barometer in the evaluation systems of HEIs, so that student's satisfaction could be regularly monitored and associated with correspondent quality actions and policies.

The main critique on MUSA methodology concerns segmentation satisfaction analysis - analysis performed in each student's cluster separately. In that case, the fitting and the stability level of the results may vary causing a problem of "inconsistency" when trying to compare global with segmentation analysis results. In this particular application, the problem mainly concerns the average satisfaction indices due to the high error level in the global satisfaction analysis (the global set is less homogenous than the segments of students).

3.4 Critical analysis on previous methods and models

In the literature to assess the impact of service quality on students' satisfaction, several conceptual models have been formulated. Much research was conducted using SERVQUAL and SERVPERF (1992). Both models utilized the same quality dimensions,

but while SERVQUAL considers both the expectations and perceptions of students, SERVPERF assumes that service quality is a performance-only measure. Weighted SERVQUAL and Weighted SERVPERF were also used. Two-Way (Schvaneveldt, Enkawa and Miyakawa, 1991), is based on the consideration that the latent factors are of ''objective'' (quality attributes) and ''subjective'' (satisfaction levels) kind; and Normed Quality (Teas, 1993), assumes that a distinction between ideal and feasible expectations has to be done in order to evaluate the service performance. Qualitometro (Franceschini and Rossetto, 1998), suggests that the perceptions and expectations measures have to be performed at different times. Additional conceptual models have been proposed focused on operations aspects related to service delivering and on reliability service, i.e. its capacity to deliver what the customer wants (Ghobadian, Speller and Jones, 1994).

Debnath et al. (2005) used the Mahalanobis-Taguchi System (MTS) tool in the management education system to study the 'gap in the management education sector caused by the difference in expected service and perceived service'. Douglas et al. (2006) utilised the concept of the service-product bundle to design the survey questionnaire and then used Quadrant Analysis (see, for example, Dillon, Madden and Firtle, 1993) to determine which aspects of the university's services were most important and the degree to which they satisfied the students.

In the context of the modern approach from marketing, the customers' decision to buy a product/service or not can be considered as an indication of customer satisfaction level. Using market research methods, the loyalty of a set of consumers in a brand can be appreciated and, therefore, the degree of satisfaction they derive from using products/services of that brand. Another approach based on that theory is based on the assumption that the degree of customer satisfaction is calculated from the comparison of the expected utility from the use of a product/service and the actual utility obtained when using the product/service.

Total Quality Management (TQM) suggests a traditional method to measure customer satisfaction based on vendor reports, a number of phone calls or complaints relating to products or services, compensation costs or warranties of good product performance.

Econometric models are also used in assessing consumer behavior in an enterprise, assessing the correlation between consumer-based performance variables (product

quality, customer satisfaction, etc.) and classical economic variables (market shares, profit margins etc).

Furthermore, classical statistical methods, such as multiple linear regression analysis, present the problem of arbitrary coding of the qualitative variables of the problem, resulting in the distortion of information externalized by the client. In order to overcome this issue, categorical data analysis methods like logit analysis and loglinear models are introduced. What these techniques attempt to do is compute the necessary correlations between qualitative variables to analyze consumer behavior. The broader category of statistical methods trying to solve that problem, include data analysis techniques, such as conjoint analysis. Based on customer opinion data, conjoint analysis aims to measure consumer trade-offs between the characteristics of the product or service. According to this method, consumers express their preferences by determining the probability of purchasing a product or service with defined characteristics.

Finally, graphical data display methods like probability plots and difference histograms are based on customer responses to a questionnaire attempting to estimate the difference between the optimum and the actual level satisfaction according to a characteristic of the product or service under consideration.

The main criticism of these methodological approaches focuses on the following characteristics:

a) Most statistical models of consumer behavior analysis are incompatible with qualitative variables and thus, qualitative variables are arbitrarily a priori encoded. As a consequence, the results strongly depend on the quality of the quantification of these variables, because of the distortion of physical information as externalized by the consumer.

b) Several approaches are using strong and difficult to prove assumptions regarding either consumer behavior (customer loyalty correlation) or the estimation model (satisfaction with a specific probability function, a correlation of satisfaction with company financials).

c) Many approaches are focusing on the assessment of characteristics to affect customer satisfaction rather than the composition and assessment of these features in a total degree of satisfaction.

d) Required information such as expected customer utility and concession points in several approaches is quite difficult to collect.

e) The predictors should be validated and refined if necessary and the relative importance of each determined.

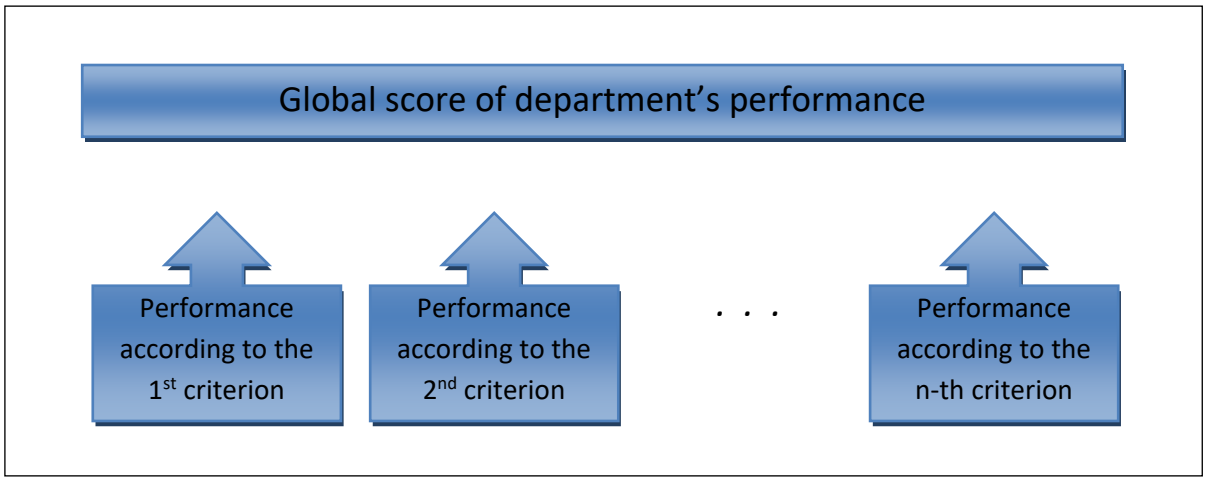
3.5 Multicriteria methodology

This section is an introduction to multicriteria methodology and its usefulness in assessing students' satisfaction.

3.5.1 Introduction

Multicriteria methodology uses advanced linear programming techniques to build a global, collective performance function. According to this methodology the department's global performance depends on a set of criteria representing service characteristic dimensions. The department's global performance is prescribed by the performance on these discrete criteria (figure 1).

Figure 1. Aggregation of criteria's performances.



Multicriteria analysis requires the identification of the effect that the different dimensions and functions of the department have on its global performance and the definition of the criteria that will be used in the evaluation process. The criteria that will be used should adequately describe the department's entity and should be constructed in a manner that will not allow their overlapping (Keeney, 1992). Furthermore, the criteria's composition should allow the department's global evaluation in a clear and acceptable manner. The latter depends on the department's performance, according to the discrete criteria, as well as the relative importance of each one of these criteria. The main goal of this method is to determine the global value of the department's performance on a 0–100 scale, where (0) is the worst and (100) is the best performance that can be achieved.

Additionally, the results are presented in performance/importance diagrams (Fig. 3) making easier the benchmarking between different departments and the monitoring of the department's progress for different periods of time. Each one of these performance/importance diagrams, also known as strategic maps or action diagrams (Dutka, 1995; Naumann and Giel, 1995; Customer Satisfaction Council, 1995), is divided into four quadrants according to performance (high/low) and importance (high/low) that may be used to classify actions:

• **Status quo** (low performance/low importance): Areas with no action required.
• **Leverage opportunity** (high performance/high importance): areas to be used as advantage against competition.
• **Transfer resources** (high performance/low importance): Areas where department's resources may be better used elsewhere.
• **Action opportunity** (low performance/high importance): Area of the criteria that need attention.

3.5.2 Multicriteria methods in assessing quality characteristics

Multicriteria methodology is able to evaluate the strategic and quality management of departments based on measurable items. It can also allow assess and compare the department's performance for different dimensions; and for different categories of stakeholders. At the same time institutes are also allowed to monitor the effect of the strategic plans on the global performance improvement. While different stakeholder

categories tend to weigh the set of criteria in a different manner, multicriteria methodology provides the opportunity to assess the preferences of each category separately. In the current dissertation, it is applicable in assessing satisfaction from the perspective of students.

3.5.3 Multicriteria analysis in students' satisfaction

Extensive research has defined several models and techniques to customer satisfaction evaluation problem. All the proposed approaches, adopt the following main principles (Grigoroudis, 1999):

a) The data of the problem are based on the customers' judgments and therefore, should be directly collected from them.
b) Customer satisfaction measurement is a multivariate evaluation problem given that customer's global satisfaction depends on a set of variables representing service characteristic dimensions.
c) An additive formula is often used in order to aggregate partial evaluations in a global satisfaction measure.

As a result, it can be assumed that client's global satisfaction depends on a set of criteria or variables representing service characteristic dimensions and thus, the customer satisfaction evaluation problem can be formulated in the context of multicriteria analysis. Furthermore, Sureshchandar et al. (2002) suggest that customer satisfaction has a multi- dimensional nature and should be operationalized along the following factors: core service(the content of a service), human elements of service, systematization of service delivery and social responsibility. In 2000, Martensen et al. acknowledge the following variables to be used in the student satisfaction model: institution image, student expectations, perceived quality of non-human elements, perceived quality of human elements, perceived value, student satisfaction and student loyalty.

From the customers' point of view, service quality also appears as a multidimensional concept (Parasuraman et. al, 1991a and b; Cronin and Taylor, 1992; McDougall and Levesque, 2000; Sureshchandar et al., 2002; Kang and James, 2004; Bigne et.al, 2003).

Although there is no general agreement regarding the number and the nature of the service quality dimensions, a large number of studies suggest quality dimensions to be related with the dimensions of customer satisfaction.

Lagrosen et al. (2004) examining the dimensions of quality in higher education identified characteristics like course offered, teaching practices, campus facilities, computer facilities, corporate collaboration, information and responsiveness etc.

As a result of global students' satisfaction consistence of several criteria and sub-criteria representing quality attributes of the offered services (study program, teaching, staff, equipment etc), a multi-criteria methodology is employed to connect quality characteristics of the HE services to student satisfaction. The proposed multi-criteria model links student satisfaction to its constituent quality components through significant indices and provides the actions that should be undertaken in order to improve the overall performance in these components. A study with this purpose is rather important since it gives grounds for quality management improvement in higher education services.

Chapter 4
Research design and methodology

The paper will attempt to present an original post graduate students' satisfaction evaluation in the OUC. The objectives of this paper are focused on the assessment of the critical satisfaction dimensions, in a quantitative mathematical function assuming that total satisfaction of each individual student depends on a set of variables.

This model aims to supply a complete set of results focused on global and partial explanatory analysis, analyzing in depth the student's behavior and expectations for each of the satisfaction criteria; and determining groups with distinctive preferences and expectations. Global explanatory analysis emphasizes on student's global satisfaction and its primary dimensions. Partial explanatory analysis focuses on each criterion and their relevant parameters separately.

4.1 Methodological framework

The research was conducted at the OUC in the spring semester 2018 and reflects the satisfaction levels of its active post graduate students. Particularly the planning of the research was based on the following steps: questionnaire development and research conduction, preliminary data analysis, elaboration and results.

This part consists of 2 sections. The first section comprises the design and the development of a questionnaire as well as the accomplishment of the research. Student questionnaires become one of the most popular methods worldwide to imprint the quality of education (Hendry and Dean, 2002). Collecting feedback from students using satisfaction questionnaires is a common practice in higher education (Leckey and Neill, 2010).

4.1.1 Satisfaction criteria

The assessment of a consistent family of criteria representing students' satisfaction dimensions is a significant component in this step. The satisfaction criteria were selected, after a review of the relevant literature.

The main set of student satisfaction criteria in this study is divided in inputs and outputs. The input criteria will provide data for partial explanatory analysis and concern the following:

a) Academic personnel
b) Content of the programme
c) Educational process
d) Infrastructure and Support Services

The output criteria will provide information for global explanatory analysis, capturing the overall learning experience. Those criteria refer to specific knowledge and skills acquired; relativity to labor market and prospects for future advancement. The satisfaction criteria and sub-criteria were defined as presented in table 5.

Based on Table 5, a self-completion questionnaire consisting of 35 questions was designed (Appendix A.) and distributed via internet (email). Students were asked to express their point of view according to a predetermined 5-pt Likert scale, representing five types of answers (Strongly dissatisfied/Dissatisfied/neither dissatisfied or satisfied/Satisfied/Strongly satisfied), capturing all the dimensions that constitute the overall student satisfaction. Each of the main criterion (dimension) was assessed using a number of sub-criteria. At the end of each main criterion, students were asked to answer to what extend their expectation regarding the criterion have been met by choosing what applies best between the following: Very below expectations/Did not meet expectations/As expected/Above expectations/Greatly exceeded expectations. They were then asked to express their satisfaction level with specific dimensions of their overall learning experience (output criteria). Finally, they were asked to express their satisfaction level with their distance learning education experience, compared with their previous conventional education.

Table 5. The criteria structure for measuring students' satisfaction.

Criteria	Sub-criteria
1. **Academic personnel**	***1.1*** Educational skills ***1.2*** Preparation adequacy ***1.3*** Ability to transmit knowledge and to motivate ***1.4*** Support in academic related areas and providing feedback ***1.5*** Promoting advanced knowledge ***1.6*** Communication of teaching staff with students ***1.7*** Behavior, caring and willingness to provide assistance
2. **Content**	***2.1*** Meeting my needs ***2.2*** Right extend of depth and scope ***2.3*** Proper balance between theory and practice ***2.4*** Appropriate study workload ***2.5*** Overall design and delivery of the programme ***2.6*** Adequate and specific information before enrolling
3. **Educational process**	***3.1*** Organization of the study process (curriculum, structure, timetable–web-conference, scheduling, etc.) ***3.2*** Study material and tools ***3.3*** Educational approach & activities ***3.4*** Assessment & evaluation methods and processes
4. **Support services**	***4.1*** Administrative service: (Correspondence, knowledge, service speed, willingness to provide assistance) ***4.2*** Library facilities (Availability of reference books, easiness of books searching) ***4.3*** IT and e-learning facilities: e-class platform ***4.4*** IT and e-learning facilities: web-conference platform ***4.5*** IT and e-learning facilities: email

	4.6 IT and e-learning facilities: administration
5. **Overall learning experience**	***5.1*** Specific Knowledge and skills acquired ***5.2*** Relativity to labor market ***5.3*** Prospects for future advancement

Initially 155 questionnaires were collected, providing all the information for data for analysis.

4.1.2 Development of the multicriteria model

Section 2 is devoted to the development of a multicriteria model to analyze student satisfaction.

The proposed methodology is moving in the field of multicriteria analysis since the total satisfaction is a function of a set of criteria that are assessed through partial satisfaction functions.

The variables used by the model are as follows:

Y: total customer satisfaction
a: number of levels of the overall satisfaction scale
y^m: the m level of total satisfaction ($m = 1, 2, \ldots, a$)
n: number of criteria
X_i: client's satisfaction according to i criterion ($i = 1, 2, \ldots, n$)
a_i: number of levels of satisfaction of the $i-$criterion
χ_i^k: k satisfaction level of the $i-$ criterion (k = 1, 2, ..., ai)
Y^*: quantitative function of Y (function of total satisfaction)
y^{*m}: value of satisfaction level Y^m
X_i^*: quantitative function of X_i (partial satisfaction function)
χ_i^{*k}: value of satisfaction level χ_i^k

The model tries to evaluate the overall and the individual satisfaction functions Y^* and X_i^* respectively, given the views expressed by Y and X_i expressed by all the customers. In the theory of multicriteria analysis the functions Y and X_i^* referred to as prosthetic and utility functions respectively. The method presented in this article follows the general principles of qualitative regression analysis under constraints using linear programming techniques.

The basic equation of regression analysis is as follows:

$$Y^* = \sum_{i=1}^{n} b_i \, X_i^*$$

$$\sum_{i=1}^{n} b_i = 1$$

where functions Y^* and X_i^* are normalized in [0,100] and b_i is the weight factor of the i-criterion.

Chapter 5
Data analysis and findings

This chapter attempts to contribute to the main knowledge about students' satisfaction with their overall experience with the OUC. In particular, the main objective is to identify in what extend students' satisfaction is influenced by specific determinants. Moreover, it attempts to identify in what extend students' expectation with those determinants are met. Finally, it attempts to identify potential students' clusters with distinctive preferences.

5.1 Data analysis

Based on the data retrieved through the 155 completed questionnaires, table 6 and figures 2 and 3 outline the profile of the investigated sample. It can be observed that the sample mainly consisted of Cypriot and Greek residents (38,06% and 59,35% respectively), and only 2,59% of the responders were residents of other countries. The percentage of male-female students in the sample was 32,26% - 67,74% respectively. It should also be noticed that students from all faculties are represented, with the faculty of Economics and Management corresponding to more than 50% of the sample (table 6).

Figure 2. Sample demographics – Gender.

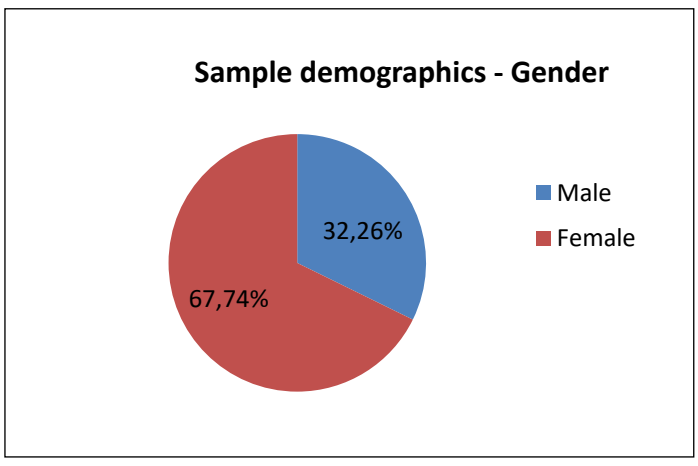


Figure 3. Sample demographics – Faculty.

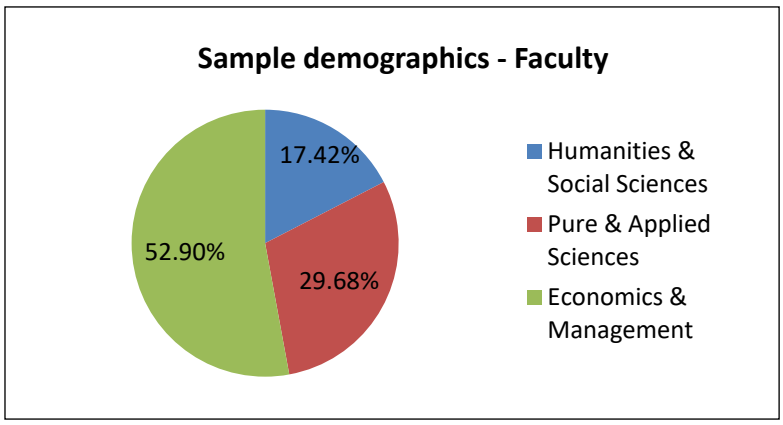


Table 6. Sample demographics.

Country of Residence	Sample count	Sample percentage
Cyprus	**59**	***38,06***
Greece	**92**	***59,36***
Czech Republic	**1**	
Netherlands	**1**	***2,58***
USA	**1**	
Germany	**1**	

Programme of study	Sample count	Sample percentage
Faculty of Humanities & Social Sciences	**27**	***17,42***
Continuing Education and Lifelong Learning	1	
Communications New Journalism	5	
Cultural Policy and Development	9	
Greek Language and Literature	9	
Theatre Studies	3	
Faculty of Pure & Applied Sciences	**46**	***29,68***
Computer and Network Security	20	
Cognitive Systems	5	
Environmental Conservation and Management	10	

Sustainable Energy Systems	1	
Social Information Systems	10	
Faculty of Economics & Management	**82**	***52,90***
Enterprise Risk Management	17	
Educational Studies	11	
European Union Law	3	
Healthcare Management	15	
Health Policy and Planning	7	
Business Administration - MBA	17	
Management, Technology and Quality	12	

5.2 Findings

Based on data analysis on the collected data, useful information regarding students' perceptions of academic experiences is collected.

5.2.1 Global satisfaction analysis

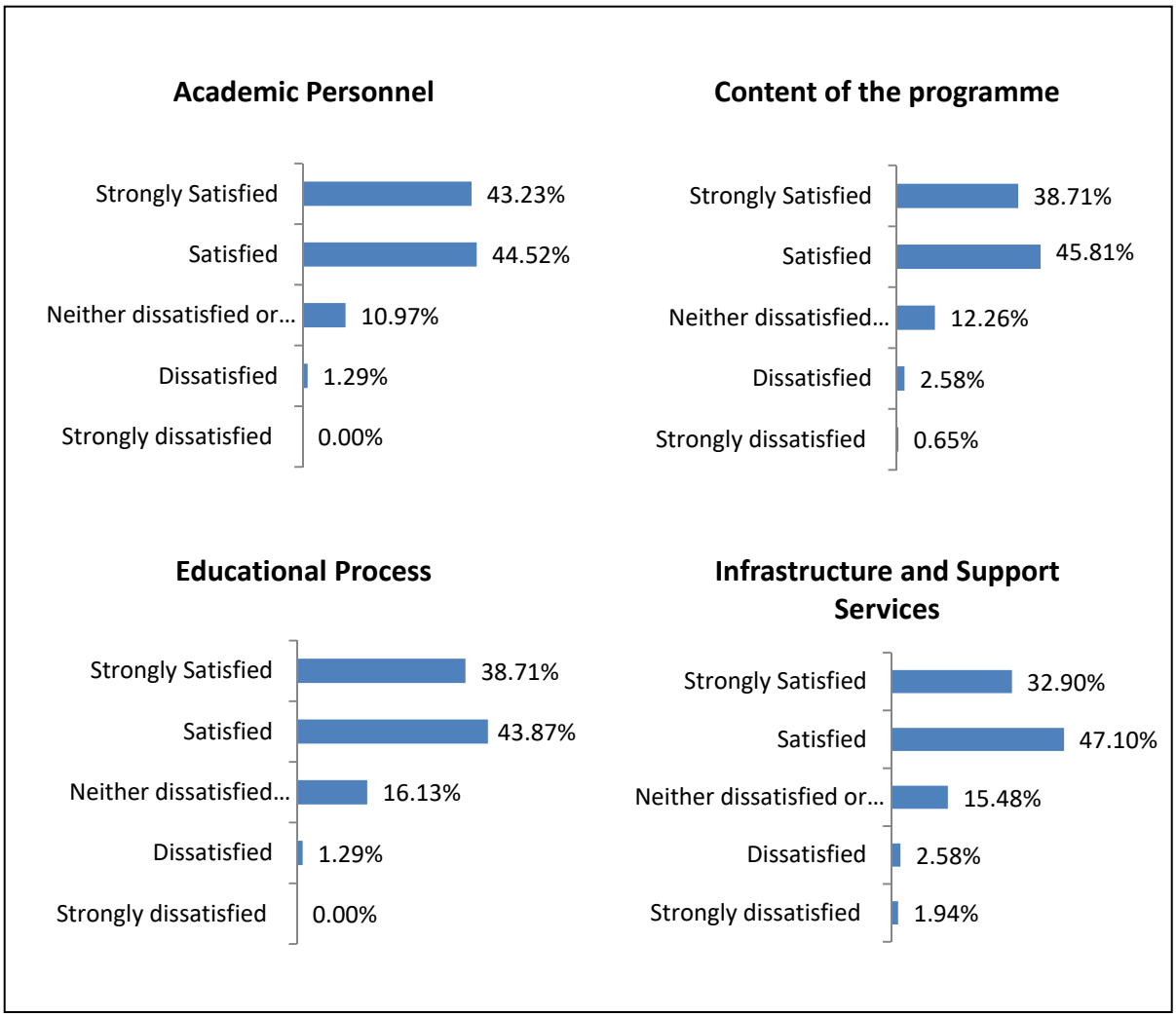
Global satisfaction analysis emphasizes on overall satisfaction and its main dimension. Overall students' judgment in each main criterion is given in Figure 4. Generally a high degree of students' satisfaction is presented in all the criteria.

In the ***academic personnel*** criterion 87,75% of the student sample are "strongly satisfied or satisfied" presenting the highest percentage in the "strongly satisfied or satisfied" category and 1,29% are "strongly dissatisfied or dissatisfied".

The results indicate that 80,00% of the sample is "strongly satisfied or satisfied" with ***infrastructure and support services***, while 4,52% appear "strongly dissatisfied or dissatisfied", presenting the highest percentage in the "strongly dissatisfied or dissatisfied" category.

With regards to the ***content of the programme*** and ***educational process*** criteria the results are 84,52% - 3,23% and 82,58% - 1,29% respectively.

Figure 4.Global satisfaction on main criteria.

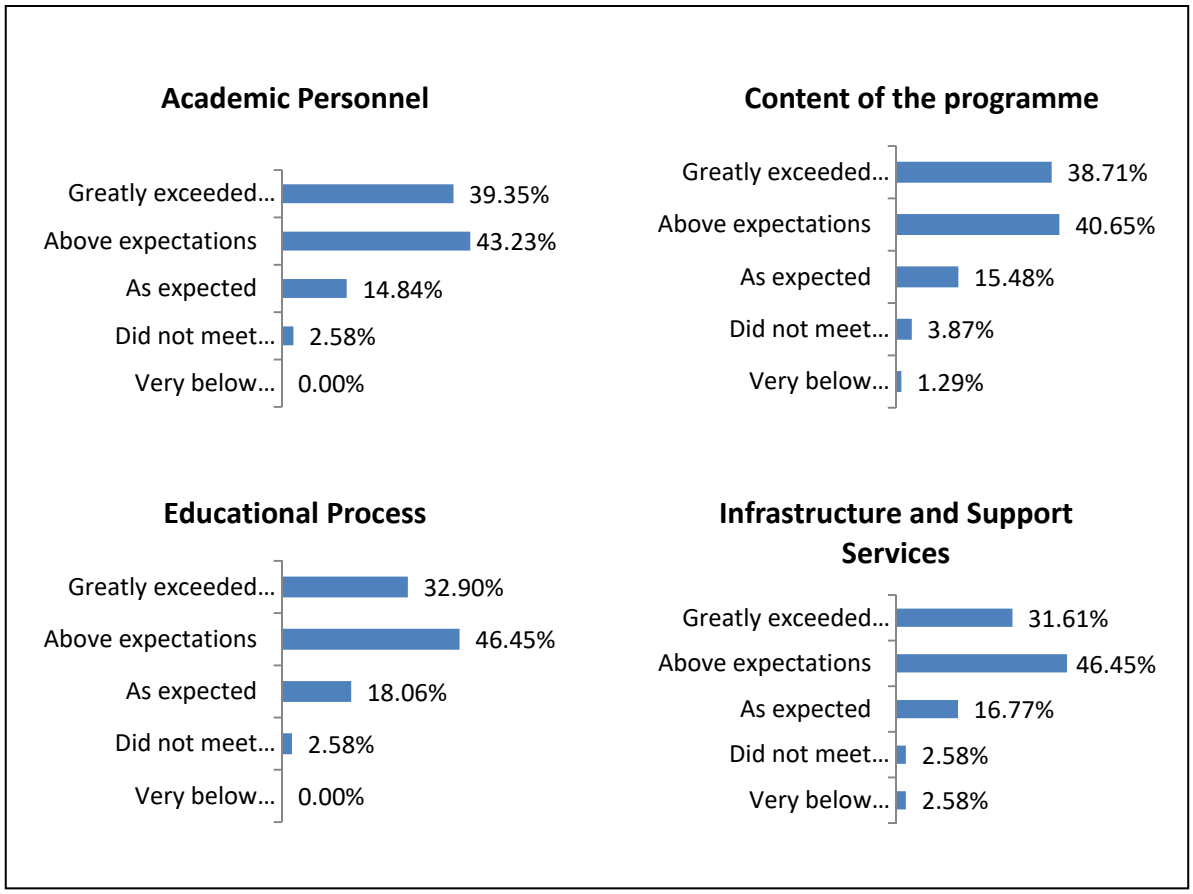


Similar results can be concluded by observing students' answers regarding extend their expectations were met with all the variables indicating the main students' satisfaction determinants (figure 5).

In particular, students' experience with all the variables "exceeded or greatly exceeded expectations", presenting percentages greater than 78%. ***Academic personnel*** presents the greater extend of "exceeding or greatly exceeding expectations" with a percentage of 82,58%, followed by both the ***content of the program*** (79,36%), ***education process*** (79,35%); and ***infrastructure and support services*** (78,06%).

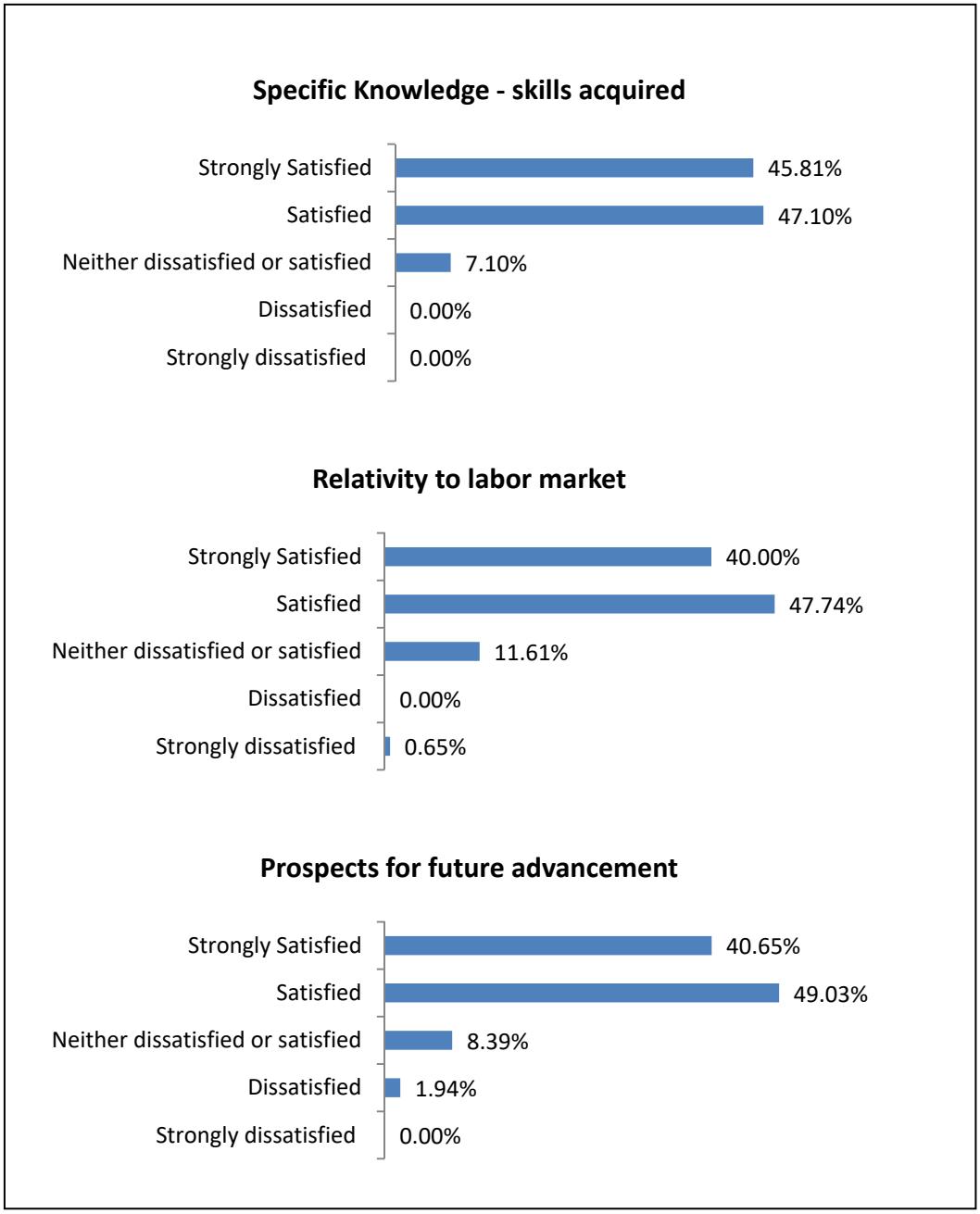
Although experience with the ***content of the program*** and ***infrastructure and support services*** present the highest extend of "below or very below expectations", the percentages are still low (5,16%).

Figure 5. Extend of expectations met.



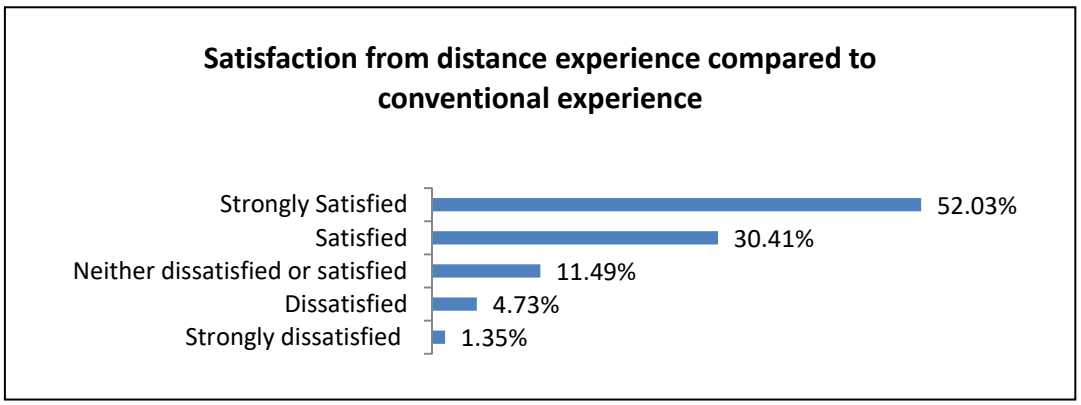
Students' overall judgment with their learning experience (figure 6) indicates a high global satisfaction degree regarding the three dimensions measured. In particular the ***knowledge – skills acquired*** criterion presents the highest percentage in the "strongly satisfied or satisfied" category (92,91%) and the lowest percentage in the "strongly dissatisfied or dissatisfied" category (0%). Students are also "strongly satisfied or satisfied" with the ***relativity of their studies to the labor market*** (87,74%) and their ***prospects for future advancement*** after the completion of their studies (89,68%).

Figure 6. Satisfaction with overall learning experience.



Regarding the comparison between online and conceptual education experience, 148 of 155 evaluations were considered as not all students had previous experience with conventional studies. From those students, a high percentage of 82,44% appears to be "strongly satisfied or satisfied" from distance learning compared with their conventional experience, while 6,08% of the sample is "strongly dissatisfied or dissatisfied" (figure 7). The fact that more than one of two students (52,03%) is "strongly satisfied" is also important, when only one of ten students appears "neither dissatisfied or satisfied".

Figure 7. Students' satisfaction from distance learning, compared to conventional learning.



5.2.2 Partial satisfaction analysis

Partial satisfaction analysis with sub-criteria is presented in table 7 and focuses on the variables of each dimension. The results indicate that students are mostly satisfied with the sub-criteria of the *academic personnel* dimension. Those variables generally present the highest percentage of "strongly satisfied or satisfied" and lower percentage of "strongly dissatisfied or dissatisfied" students. The *content of the programme* criterion contains the variables with the lowest percentage of "strongly satisfied or satisfied" and highest percentage of "strongly dissatisfied or dissatisfied" students.

In particular, it can be revealed from the results (table 7) that the variables with the highest satisfaction rate are the ***email facility*** from the *infrastructure and Support Services* criterion (91,61%); and the ***behavior, caring and willingness of academic personnel to provide assistance*** (90,97%). High satisfaction percentages are also observed in ***educational skills*** and ***preparation adequacy*** of *academic personnel* (89,68% both); and ***e-class platform facility*** (89,67%).

It is also observed that *content of the programme* is the criterion containing the variables with the lowest satisfaction rate with a percentage of 63,87%. Those variables are ***proper balance between theory and practice*** and ***adequate and specific information before enrolling***. Low satisfaction percentages are also presented for the ***library facilities*** of the University (*71,61%),* showing that students are not satisfied by the availability of reference books and easiness of books searching.

The highest percentage of "strongly dissatisfied or dissatisfied" students is presented for ***proper balance between theory and practice*** (11,62%) and ***adequate and specific information before enrolling*** (10,97). ***Preparation adequacy*** (0,65%), ***educational skills*** (1,29%) and ***support in academic related areas and providing feedback*** (1,94%) of *academic personnel* are the variables with the lowest "dissatisfaction" percentage, indicating again students' satisfaction with academic personnel.

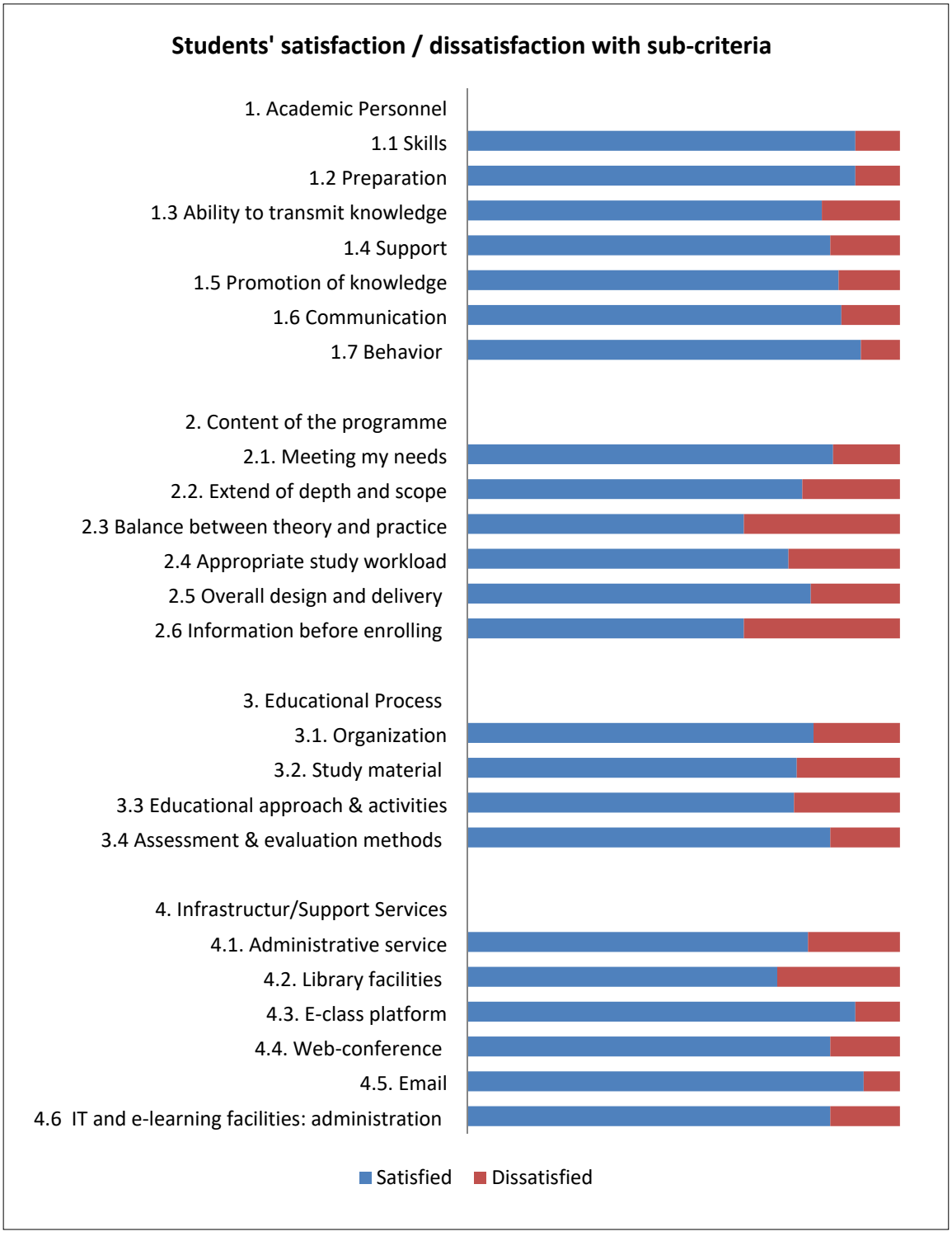
Table 7. Sub-criteria satisfaction frequencies (%).

Sub-criteria	*Strongly dissatisfied*	*Dissatisfied*	*Neither dissatisfied or satisfied*	*Satisfied*	*Strongly satisfied*
1. Academic personnel					
1.1. Educational skills	0	1.29	9.03	42.58	47.10
1.2. Preparation adequacy	0.65	0	9.68	49.68	40.00
1.3. Ability to transmit knowledge and to motivate	0.65	1.94	15.48	49.68	32.26
1.4. Support in academic related areas and providing feedback	0	1.94	14.19	34.19	49.68
1.5. Promoting advanced knowledge	1.29	1.29	11.61	38.06	47.74
1.6. Communication between teaching staff and students	1.29	4.52	7.74	36.13	50.32
1.7. Behavior, caring, willingness to provide assistance	0.65	1.94	6.45	25.81	65.16
2. Content of the programme					
2.1 Meeting my needs	1.94	3.23	10.32	43.87	40.65
2.2 Right extend of depth and scope	0	5.81	16.77	40.00	37.42
2.3 Proper balance between theory and	1.94	9.68	24.52	41.29	22.58

practice					
2.4 Appropriate study workload	0	5.81	20.00	51.61	22.58
2.5 Overall design and delivery of the programme	0	5.81	14.84	42.58	36.77
2.6 Adequate and specific information before enrolling	3.87	7.10	25.16	35.48	28.39
3. Educational process					
3.1 Organization of the study process	0.65	2.58	16.77	40.65	39.35
3.2 Study material and tools	0.65	5.81	17.42	38.71	37.42
3.3 Educational approach & activities	0.65	2.58	21.29	43.23	32.26
3.4 Assessment & evaluation methods and processes	0	3.23	12.90	48.39	35.48
4 Infrastructure and Support Services					
4.1 Administrative service:(knowledge, correspondence,etc.)	3.23	1.29	16.77	36.13	42.58
4.2 Library facilities	1.29	6.45	20.65	39.35	32.26
4.3 IT and e-learning facilities: e-class platform	1.94	2.58	5.81	39.35	50.32
4.4 IT and e-learning facilities: web-conference platform	1.29	3.87	10.97	39.35	44.52
4.5 IT and e-learning facilities: email	0	3.23	5.16	41.29	50.32
4.6 IT and e-learning facilities: administration	1.94	2.58	11.61	46.45	37.42

Students are considered to be satisfied when they are “strongly satisfied” or “satisfied”; and not satisfied when they are “strongly dissatisfied”, “dissatisfied” or “neither dissatisfied or satisfied”. Figure 8 presents the result of students’ satisfaction / dissatisfaction with sub-criteria.

Figure 8. Students’ satisfaction / dissatisfaction with sub-criteria.



As indicated in table 8, the mean percentage of "satisfaction" in sub-criteria is 81,15% and represents "strongly satisfied or satisfied" students. The mean percentage of "dissatisfied" students in sub-criteria is 4,72% and refers to "strongly dissatisfied or dissatisfied" students.

Table 8. Satisfaction / dissatisfaction analysis with sub-criteria.

dissatisfied/strongly dissatisfied students		*satisfied/strongly satisfied students*	
Mean	4,72%	Mean	81,15%
Standard Error	0,57%	Standard Error	1,62%
Median	4,52%	Median	83,87%
Mode	5,81%	Mode	83,87%
Standard Deviation	2,72%	Standard Deviation	7,79%
Minimum	0,65%	Minimum	63,87%
Maximum	11,62%	Maximum	91,61%

5.2.3 Segmentation satisfaction analysis

Segmentation satisfaction analysis is conducted through contingency analysis. The main aim of this particular analysis is to determine students' clusters with distinctive preferences. The discriminating variables that have been used for identifying special groups of students are:

A) gender,
B) country of residence,
C) faculty of study and
D) number of modules taken (divided in four categories: 1-3, 4-6, 7-9, more than 10).

Since students' satisfaction is the main objective of HEIs, responses are divided into three categories: not satisfied (strongly dissatisfied/ dissatisfied/ neither dissatisfied or satisfied), satisfied, and strongly satisfied.

Hypothesis testing is used to identify potential clusters with distinctive preferences. A hypothesis is set for each of the main (input and output) criteria, for all special groups, in the following form:

H_0: Overall students' satisfaction with (main criterion) is independent of (special group)

H_A: Overall students' satisfaction with (main criterion) is not independent of (special group)

Similarly, extend of expectations met is analyzed for the input criteria through the following form:

H_0: Meeting students' expectations with (main criterion) is independent of (special group)

H_A: Meeting students' expectations with (main criterion) is not independent of (special group)

Using Microsoft Excel, chi-square tests of independence are performed for all the main criteria, using contingency tables. The confidence level is 0,05 and degrees of freedom are 2, 4, 4 and 6 for the gender, country of residence, faculty and number of modules taken respectively. The hypothesis is rejected when the p-value of test is lower than 0,05. The contingency tables are presented in Appendix B.

Tables 9, 10 and 11 summarize the results of contingency table analysis, representing the relationship of special groups with the input criteria, output criteria and extend of meeting expectations, respectively.

Table 9. Contingency table analysis (input criteria).

	Gender	***Country of Residence***	***Faculty***	***Modules***
Academic personnel	d.f.= 2 p-value = 0.616	d.f.= 4 p-value = 0,361	d.f.= 4 p-value = 1,926e^-5*	d.f.= 6 p-value = 0,823
Content of the programme	d.f.= 2 p-value = 0,190	d.f.= 4 p-value = 0,696	d.f.= 4 p-value = 0,006*	d.f.= 6 p-value = 0,285
Educational process	d.f.= 2 p-value = 0,494	d.f.= 4 p-value = 0,092	d.f.= 4 p-value = 0,001*	d.f.= 6 p-value = 0,175
Infrastructure	d.f.= 2	d.f.= 4	d.f.= 4	d.f.= 6

and Support Services	p-value = 0,416	p-value = 0,633	p-value = 0,001*	p-value = 0,294

* test is significant

Table 10. Contingency table analysis (output criteria).

	Gender	***Country of Residence***	***Faculty***	***Modules***
Knowledge and skills acquired	d.f.= 2 p-value = 0.933	d.f.= 4 p-value = 0,589	d.f.= 4 p-value =1,979e^-5*	d.f.= 6 p-value = 0,048*
Relativity to labor market	d.f.= 2 p-value = 0,500	d.f.= 4 p-value = 0,703	d.f.= 4 p-value = 4,204e^-5*	d.f.= 6 p-value = 0,236
Future advancement	d.f.= 2 p-value = 0,420	d.f.= 4 p-value = 0,135	d.f.= 4 p-value = 0,00042*	d.f.= 6 p-value = 0,305

* test is significant

Table 11. Contingency table analysis (expectations with input criteria).

	Gender	***Country of Residence***	***Faculty***	***Modules***
Academic personnel	d.f.= 2 p-value = 0.971	d.f.= 4 p-value = 0,255	d.f.= 4 p-value = 9,99e^-5*	d.f.= 6 p-value = 0,317
Content of the programme	d.f.= 2 p-value = 0,041*	d.f.= 4 p-value = 0,421	d.f.= 4 p-value = 0,087	d.f.= 6 p-value = 0,293
Educational process	d.f.= 2 p-value = 0,252	d.f.= 4 p-value = 0,340	d.f.= 4 p-value = 0,005*	d.f.= 6 p-value = 0,471
Infrastructure and Support Services	d.f.= 2 p-value = 0,386	d.f.= 4 p-value = 0,632	d.f.= 4 p-value = 0,005*	d.f.= 6 p-value = 0,931

* test is significant

The results reveal the following:

- Faculty is revealed to be the main factor to be significantly related with students' satisfaction with all the main criteria (table 9). In particular satisfaction with *academic personnel*, content of the programme, *educational process*; and *infrastructure* are significant with faculty.

- Overall satisfaction with *Knowledge and skills acquired, relativity to labor market and future advancement* is significant with faculty (table 10).

- As indicated in table 11, extend of meeting students' expectations with *academic personnel, educational process* and *infrastructure* is significant with faculty. There is no evidence of significance between meeting students' expectations with the *content of the programme* and faculty.

- Overall satisfaction with *knowledge/skills acquired* is the only variable identified to be significantly related with the number of modules taken (table 10).

- Country of residence appears to be insignificant with any criterion. In particular, there is no significant relationship between students' satisfaction with country of residence and any of the input criteria (table 9). There is also no evidence of significant relationship between the country of residence and overall satisfaction with all output criteria (table 10). Furthermore, extend of meeting expectation with all the criteria is not significant with country of residence (table 11).

- The gender of the responder is significant with extend of meeting expectations with *content of the programme* only. Despite that, there is no significant relationship between the gender and satisfaction with the rest of the input and output criteria (tables 9, 10).

5.2.4 Criteria significance analysis

The last part of analysis is dedicated to checking the appropriateness of the criteria and sub-criteria used in the research. Linear regression analysis is used to determine the significance of explanatory variables for each dependent variable.

In particular, using sub-criteria as explanatory variables and main criteria as the corresponding dependent variables, the significance of each sub-criterion with respect to the main criterion will be checked. Moreover, in order to identify which of the main criteria are significant with overall students' satisfaction, the main criteria are used as independent variables and output criteria as dependent variables. The null hypothesis assumes that there is no significant linear relationship between dependent and independent variables (all coefficients are equal to zero).

The appropriateness of linear regression analysis for assessing students' satisfaction, compared to ordinal regression should be further analyzed.

Linear regression is used to identify the existence of significant linear relationship between independent and dependent variables. Pasta (2009) assumes that "everything is linear to a first approximation" and deviations from linearity can be considered once the basic model is established.

Ordinal scales are typically measures of non-numeric concepts like satisfaction. There is some agreement that Likert-scale data should generally be treated as ordinal and not treated as interval/ratio data.

Ordinal variables are often used as explanatory variables in models. It is common to treat those variables as continuous. The case with ordinal variables is that there is no evidence that the ordinal categories are equally spaced. It can be said whether a score is higher than other, but not the distance between the points. There is also no evidence that there is a linear relationship between continuous variables.

Long and Freese, (2006) argue that in order to treat ordinal variables as continuous a strong assumption that categories are equally spaced must be made. As a result, it is okay to treat an ordinal variable as though it had linear effects.

The summary output of test is presented in Appendix C. The results of the test of hypothesis for each criterion are presented below:

1. Academic personnel

Regression model:

Y= overall satisfaction with academic personnel

Xi: satisfaction with the i-th sub-criterion, as shown in table 12

$$Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6+b7.X7$$

Testing the model:
The explanatory power of the model is relatively high ($R^2 = 0{,}687$), which means that almost 69% of the variation in students' satisfaction regarding the academic personnel is explained by the sub-criteria used.

Statistically the model is significant at 5% level (P-value = 4.28E-34, F-value =46.22, F-critical =0.31).

Regarding the individual explanatory variables regression analysis shows that academic personnel's *skills*, *ability to transmit knowledge* and *promote knowledge*; and *communication* are significant in explaining students' satisfaction, while *preparation*, *support* and *behavior* may not be considered significant.

Table 12. Significance of coefficients for academic personnel sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	1.0 intercept	0,0088544*	0,62607068
X1	1.1 skills	0,0414622*	0,169082946
X2	1.2 preparation	0,1737409	0,109318163
X3	1.3 transmit knowledge	0,0017621*	0,211953286
X4	1.4 support	0,3767295	0,0625756
X5	1.5 promoting knowledge	0,0253888*	0,147809702
X6	1.6 communication	9,827E-05*	0,254602472
X7	1.7 behavior	0,2441869	-0,089235088

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

Y= 0,66+0,22.*X1+* 0,25.*X3+*0,14.*X5+*0,24.*X6*

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is *4,91.*

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,85).

2. Content of the programme

Regression model:

Y= overall satisfaction with content of the programme

Xi: satisfaction with the i-th sub-criterion, as shown in table 13

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6

Testing the model:
The explanatory power of the model is relatively high ($R^2 = 0{,}729$), which means that almost 73% of the variation in students' satisfaction regarding the content of the programme is explained by the sub-criteria used.

Statistically the model is significant at 5% level (P-value = 1.346E-39, F-value =66.627, F-critical = 0.27).

Regarding the individual explanatory variables regression analysis shows that *design and delivery* of the content, extend of *meeting students' needs* and *availability of information before enrolling* are significant in explaining students' satisfaction, while *study workload*, *balance between theory and practice* and *extend of depth and scope* may not be considered significant.

Table 13. Significance of coefficients for content sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	2.0 intercept	0.0001657*	0.743609813
X1	2.1 meeting my needs	0.0003785*	0.250362578
X2	2.2 extend of depth and scope	0.7497011	0.023501533
X3	2.3 balance between theory and practice	0.6940537	0.020552698
X4	2.4 study workload	0.5706448	0.033957986
X5	2.5 design and delivery	5.744E-06*	0.351864214
X6	2.6 information before enrolling	0.000237*	0.173268234

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y= 0{,}8+0{,}27.X1+0{,}39.X5+0{,}18.X6$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 5.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,84).

3. Educational process

Regression model:

Y= overall satisfaction with educational process

Xi: satisfaction with the i-th sub-criterion, as shown in table 14

$$Y= b0+b1.X1+b2.X2+b3.X3+b4.X4$$

Testing the model:

The explanatory power of the model is relatively high ($R^2 = 0{,}691$), which means that more than 69% of the variation in students' satisfaction regarding the educational process is explained by the sub-criteria used.

Statistically the model is significant at 5% level (P-value = 2.73 E-37, F-value =83.98, F-critical = 0.18).

Regarding the individual explanatory variables regression analysis shows that *organization* of the process, *educational approach-activities* and *assessment and evaluation methods* are significant in explaining students' satisfaction, while *study material* may not be considered significant.

Table 14. Significance of coefficients for educational process sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	3.0 intercept	0.002294095*	0.633813
X1	3.1 organization	9.84508E-05*	0.227671
X2	3.2 study material	0.151631415	0.089149
X3	3.3 approach	0.000117421*	0.282594
X4	3.4 assessment	0.000772834*	0.268328

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y= 0{,}61+0{,}26.X1+ 0{,}3.X3+0{,}31.X4$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 4,96.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,97).

4. Infrastructure and support services

Regression model:

Y= overall satisfaction with Infrastructure and support services

Xi: satisfaction with the i-th sub-criterion, as shown in table 15

$$Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6$$

Testing the model:

The explanatory power of the model is high ($R^2 = 0{,}793$), which means that more than 79% of the variation in students' satisfaction regarding infrastructure and support services is explained by the sub-criteria used.

Statistically the model is significant at 5% level (P-value = 3.697 E-48, F-value =94.759, F-critical =0.27).

Regarding the individual explanatory variables regression analysis shows that *administrative service*, *web-conference platform* and *administration* are significant in explaining students' satisfaction, while *library*, *e-class platform* and *email* may not be considered significant.

Table 15. Significance of coefficients for Infrastructure sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	4.0 intercept	0.5602616	0.119423127
X1	4.1 administrative service	5.946E-10*	0.352652637
X2	4.2 library	0.9344461	0.003661167
X3	4.3 e-class platform	0.2606149	-0.085310708
X4	4.4 web-conference platform	0.0105477*	0.191227525
X5	4.5 email	0.5044466	0.048305459
X6	4.6 administration	7.5E-09*	0.439528342

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y = 0{,}35.X1 + 0{,}15.X4 + 0{,}44.X6$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 4,7.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,94).

Table 16 summarizes the results.

Table 16. Significance/non-significance of sub-criteria – input criteria.

Main criteria	*Significant sub-criteria*	*Non-significant sub-criteria*
Academic Personnel	Skills Transmit knowledge Promoting knowledge Communication	Preparation Support Behavior
Content of programme	Meeting my needs Design and delivery Information before enrolling	Extend of depth and scope Balance between theory and practice Study workload
Educational Process	Organization Approach Assessment	Study material
Infrastructure/Support services	Administrative service Web-conference platform Administration	Library E-class platform Email

It remains to be identified which input-criteria are significant for each output criterion. Tests and results are presented below:

1. Overall satisfaction with Specific Knowledge and skills acquired

Regression model:

Y= overall satisfaction with Specific Knowledge and skills acquired

Xi: satisfaction with the i-th criterion, as shown in table 17

$$Y= b0+b1.X1+b2.X2+b3.X3+b4.X4$$

Testing the model:

The explanatory power of the model is relatively high ($R^2 = 0{,}653$), which means that more than 65% of the variation in students' satisfaction regarding Specific Knowledge and skills acquired is explained by the main criteria used.

Statistically the model is significant at 5% level (P-value =1.49 E-33, F-value =70.73, F-critical =0.18).

Regarding the individual explanatory variables regression analysis shows that *academic personnel*, *content of the programme* and the *educational process* are significant in explaining students' satisfaction, while the *infrastructure services* may not be considered significant.

Table 17. Significance of coefficients for knowledge and skills acquired sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	Intercept	1.59E-10*	1.324108
X1	Academic personnel	0.013527*	0.158743
X2	Content	0.011595*	0.146583
X3	Process	8.54E-11*	0.458141
X4	Infrastructure	0.440679	-0.03887

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y = 1{,}32 + 0{,}14.X1 + 0{,}14.X2 + 0{,}45.X3$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 4,97.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,73).

2. Overall satisfaction with Relativity to labor market

Regression model:

Y= overall satisfaction with Relativity to labor market

Xi: satisfaction with the i-th criterion, as shown in table 18

$$Y = b0 + b1.X1 + b2.X2 + b3.X3 + b4.X4$$

Testing the model:

The explanatory power of the model is low ($R^2 = 0{,}493$), which means that only 49% of the variation in students' satisfaction regarding Relativity to labor market is explained by the main criteria used and thus, the model has low explanatory value.

Statistically the model is significant at 5% level (P-value =2.67 E-21, F-value =36.53, F-critical =0.18).

Regarding the individual explanatory variables regression analysis shows that *academic personnel*, *content of the programme* and the *educational process* are significant in explaining students' satisfaction, while the *infrastructure services* may not be considered significant.

Table 18. Significance of coefficients for relativity to labor market sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	Intercept	6.37E-05*	1.105698
X1	Academic personnel	0.001317*	0.289954
X2	Content	0.031248*	0.17389
X3	Process	0.000181*	0.351071
X4	Infrastructure	0.309165	-0.07154

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y = 1{,}11 + 0{,}26.X1 + 0{,}16.X2 + 0{,}33.X3$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 4,86.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,85).

3. Overall satisfaction with future advancement

Regression model:

Y= overall satisfaction with future advancement

Xi: satisfaction with the i-th criterion, as shown in table 19

$$Y= b0+b1.X1+b2.X2+b3.X3+b4.X4$$

Testing the model:

The explanatory power of the model is relatively low ($R^2 = 0{,}547$), which means that 55% of the variation in students' satisfaction regarding future advancement is explained by the main criteria used and thus, the model has relatively low explanatory value.

Statistically the model is significant at 5% level (P-value =6.32 E-25, F-value =45.36, F-critical =0.18).

Regarding the individual explanatory variables, regression analysis shows that *academic personnel*, *content of the programme* and *infrastructure* are significant in explaining students' satisfaction, while the *educational process* may not be considered significant.

Table 19. Significance of coefficients for future advancement sub-criteria.

	Sub-criteria	***p-value***	***Coefficient (bi)***
	Intercept	2.26E-05*	1.092151
X1	Academic personnel	0.001696*	0.263031
X2	Content	0.000386*	0.26982
X3	Process	0.569233	0.048452
X4	Infrastructure	0.006803*	0.17875

* coefficient is significant at 5% level

After running the model using only the significant explanatory variables, the regression equations is stated as:

$$Y= 1{,}11+0{,}28.X1+ 0{,}29.X2+0{,}19.X4$$

A simple validation test shows that if students rate those criteria with the highest grade (5), the expected overall satisfaction rating is 4,91.

A reduction in all sub criteria by 1 point will result in reducing the overall satisfaction by almost one point (0,76).

Table 20 summarizes the results.

Table 20. Significance/non-significance of sub-criteria – output criteria.

Main criteria	*Significant sub-criteria*	*Non-significant sub-criteria*
Specific Knowledge and skills acquired	Academic personnel Content Process	Infrastructure/Support services
Relativity to labor market	Academic personnel Content Process	Infrastructure/Support services
Future advancement	Academic personnel Content Infrastructure/Support services	Process

Chapter 6
Conclusions and recommendations

This chapter presents the conclusions that can be derived from the analysis, limitations of the postgraduate dissertation and recommendations for future research.

6.1 Conclusion

The first research sub-question was discussed in chapters 2 and 3 using literature review and previous studies; and presented in Chapter 4. The main determinants of students' satisfaction are related to:

a) academic personnel,
b) content of the programme,
c) educational process; and
d) infrastructure and support services

as presented in table 5 (chapter 4).

Maximization of satisfaction with those determinants can result to a cohort of highly satisfied students.

One of the main focuses of this dissertation is to study students' satisfaction with OUC and identify the relation between students' satisfaction and those determinants.

Satisfaction with the input criteria:

A generally high degree of students' satisfaction with OUC is presented in all the main criteria. The mean "satisfaction" percentage in sub-criteria is 81,15% and refers to "strongly satisfied or satisfied" students. Scores are above the mean for the majority of sub-criteria. The results indicate that the variables with the highest satisfaction rate are ***email facility*** (91,61%), ***behavior, caring and willingness of academic personnel to provide assistance*** (90,97%), ***educational skills*** and ***preparation adequacy*** of *academic personnel* (89,68% both); **and *e-class platform*** (89,67%).

The mean percentage of "dissatisfied" students in sub-criteria is 4,72% and refers to "strongly dissatisfied or dissatisfied" students. The *content of the programme* includes the variables with the highest "dissatisfaction" rate, indicating an area of high attention needed. In particular, students appear highly dissatisfied with the ***balance between theory and practice*** and ***availability of information before enrolling,*** while being dissatisfied with ***extend of depth and scope, appropriate study workload*** and ***overall design and delivery of the programme.*** Those variables are all parameters of the *content of the programme*. Dissatisfaction is also observed with ***study material and tools;*** and ***library facilities.***

It is also observed that while ***communication between teaching staff and students***, ***content meeting students' needs***; and ***web-conference platform*** present high dissatisfaction percentages, they also present relatively high satisfaction percentages, indicating the need for improvement.

On the other hand, all the academic personnel sub-criteria present high satisfaction rates. The same applies for ***assessment and evaluation methods***; and ***IT and e-learning facilities: administration***.

Even though several variables to satisfy/dissatisfy students are analyzed above, the results of regression analysis indicate that not all the variables are significant. In particular, some sub-criteria presenting high satisfaction rates, present no evidence that they are significant with students' satisfaction, including the ***e-class platform*** and ***email*** from infrastructure; and ***behavior*** and ***preparation adequacy*** of academic personnel. Moreover, although students are "dissatisfied" with the ***balance between theory and***

practice, ***extend of depth and scope***, ***study workload*** and ***study material;*** those sub-criteria may not be significant with students' dissatisfaction.

In particular:

a) Academic personnel's ***educational skills***, ***ability to transmit knowledge*** and ***promote advanced knowledge***; and ***communication between staff and students*** are significant in explaining students' satisfaction, while ***preparation***, ***support*** and ***behavior*** may not be considered significant. As indicated, students consider the academic skills of educational personnel to be more important than the behavioral ones.

b) ***Design and delivery*** of the content, extend of ***meeting students' needs*** and ***availability of information before enrolling*** are significant in explaining students' satisfaction, while ***study workload***, ***balance between theory and practice*** and ***extend of depth and scope*** may not be considered significant.

c) ***Organization*** of educational process, ***educational approach-activities*** and ***assessment and evaluation methods*** are significant in explaining students' satisfaction, while ***study material*** may not be considered significant.

d) ***Administrative service***, ***web-conference platform*** and ***administration facilities*** are significant in explaining students' satisfaction, while ***library***, ***e-class platform*** and ***email*** may not be considered significant.

From the variables identified as significant with students' satisfaction, those presenting satisfaction percentages above the mean are the following:

- *Educational skills*
- *Ability to transmit knowledge*
- *Promoting advanced knowledge*
- *Communication*
- *Meeting students' needs*

- *Organization of the study process*
- *Assessment & evaluation methods and processes*
- *Web-conference platform*
- *Administration*

For OUC management, attention should be given on retaining and even increasing satisfaction with the above variables.

Moreover, management should focus on minimizing dissatisfaction with the significant variables that present dissatisfaction percentages above the mean. Those are:

- *Communication*
- *Meeting students' needs*
- *Overall design and delivery of the programme*
- *Adequate and specific information before enrolling*
- *Web-conference platform*

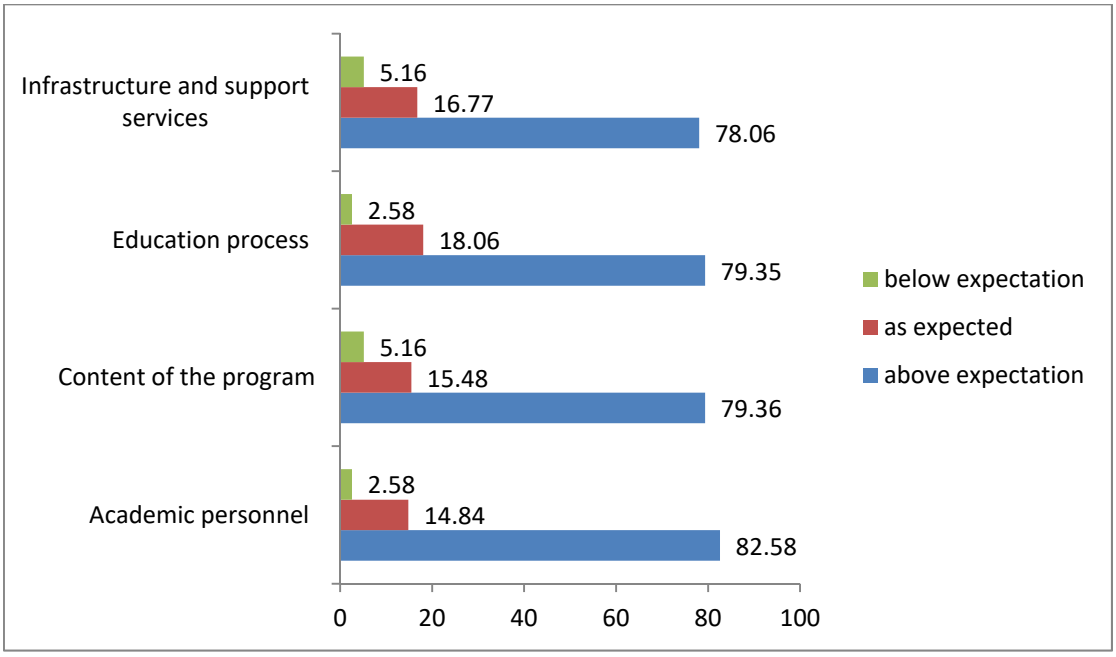
Extend of meeting expectations:

Around eight of ten students say that their experience with the main variables "exceeded or greatly exceeded" their expectations. This is aligned with the general finding of students' being "satisfied" with their experience with OUC.

In particular, *academic personnel* presents the greater extend of "exceeding or greatly exceeding expectations" with a percentage of 82,58%, followed by both the *content of the program* (79,36%), *education process* (79,35%); and *infrastructure and support services* (78,06%).

The results show that students' experience with OUC is "below expectations" or "as expected" for 17,42% of students' for *academic personnel*, 20,64% for the *content of the programme*, 20,64% for *educational process* and 21,93% for *infrastructure and support services* (figure 9).

Figure 9. Meeting students' expectation (%).



As analyzed in chapter 2, service quality is defined in terms of "*meeting or exceeding customer expectations, or as the difference between customer perceptions and expectations of service*", (Nitecki et al., 2000). Furthermore, students' expectations determine the outcome of satisfaction. As a result, HEIs should not only focus on meeting but on even exceeding students' expectation and students in OUC expected a higher level of service with regards to the variables above.

Overall students' satisfaction:

Students' judgment with their overall learning experience indicates a high global satisfaction degree regarding all the three dimensions measured. In particular students are "satisfied" with ***knowledge – skills acquired*** (92,9%), ***relativity of their studies to the labor market*** (87,7%) and their ***prospects for future advancement*** after the completion of their studies (89,7%). The percentages of student being "not satisfied or dissatisfied" are 7,1% , 12,3% and 10,3% respectively.

The results of regression analysis do not provide evidence that all the main criteria are significant for the overall satisfaction. In particular:

a) *Academic personnel*, *content of the programme* and the *educational process* are significant in explaining students' satisfaction with ***specific knowledge and skills acquired***, while the *infrastructure services* may not be considered significant.

b) *Academic personnel*, *content of the programme* and *educational process* are significant in explaining students' satisfaction with ***relativity to labor market***, while the *infrastructure services* may not be considered significant. *Moreover,* the *relativity to labor market* criterion present a very low R^2 percent in 5.2.4, indicating a low explanatory value of the model. In particular, only 49% of the variation in satisfaction with *relativity to labor market* can be explained by variation in satisfaction with the main criteria.

c) *Academic personnel*, *content of the programme* and *infrastructure* are significant in explaining students' satisfaction with ***prospects for future advancement***, while the *educational process* may not be considered significant. Again, only 55% of the variation in satisfaction with *prospects for future advancement* can be explained by variation in satisfaction with the main criteria.

Furthermore, regarding the methodology used and results, the *relativity to labor market* and *prospects for future advancement* output criteria present a low R^2 percent in section 5.2.4, indicating a low explanatory value of the model. In particular, only 49% of the variation in satisfaction with *relativity to labor market* and 55% of the variation in satisfaction with *prospects for future advancement* can be explained by variation in satisfaction with the main criteria.

One of the main interests in this research is to identify potential groups with distinctive preferences and expectations. The results indicate that faculty is the main factor to affect students' satisfaction with OUC. Furthermore, there is a significant relationship between the gender of the responder and extend of expectation met with the *content of the programme*. Finally, the number of modules taken affects the overall satisfaction with ***knowledge/skills acquired*.**

Another point of interest is to determine if students' expectations from online learning are different from previous conventional studies. More than one of two students

(52,03%) is “strongly satisfied” and three of ten (30,41%) are “satisfied” with online experience compared with previous conceptual education experience. One of ten students (11,49%) is “neither dissatisfied or satisfied” and one of twenty (6,08%) is “strongly dissatisfied or dissatisfied”.

In conclusion:

The results indicate that the mean student satisfaction with OUC is quite high (81,15%) suggesting though marginal improvements, in order for the OUC to gain competitive advantage.

a) Special attention should be given on the ***content of the academic programmes*** and their various parameters. Section 5.2.3 shows that students’ satisfaction with the ***content of academic programme*** is significantly related with three main criteria (2.1, 2.5 and 2.6). OUC management efforts should focus on minimizing dissatisfaction with meeting students’ needs (2.1); and minimizing dissatisfaction and maximizing satisfaction with the *design and delivery* (2.5) and availability of *adequate information before enrolling* (2.6).

b) Understanding, meeting and even exceeding students’ expectations is another area of attention. The importance of exceeding students’ expectations is analyzed in chapter 2.

6.2 Limitations and recommendations for further research

As the study involved only a sample of postgraduate students from one University, the results cannot be generalized to the whole HE sector of Cyprus. Further studies can include sample from any level of study, from all the HEIs in Cyprus and generalize the finding in the HE sector of Cyprus.

Furthermore, the cases with low explanatory value can be an issue to be addressed in future studies. In particular, low explanatory value can be a consequence of failure to

identify all the significant factors. Those factors could be identified through students' interviews, while qualitative research should work complementary. The predictors of students' overall satisfaction should be validated and refined if necessary and the relative importance of each determined.

Future prospect would be the construction of a research directed to investigate HE quality expectations not only from students' perspective but also from a service provider perspective (Houston and Rees, 1999).

Appendix A
Questionnaire

Dear fellow students

Thank you for taking your time for answering my questionnaire. Your answers are very important for my research on students' satisfaction with the Open University of Cyprus.

This questionnaire is anonymous and all of your answers are confidential. The data of the questionnaire are used for scientific - research purposes only.

Please answer all the questions in the manner specified each time.

It takes less than 5 minutes to complete the supplement.

Questionnaire

Programme of study:

Gender: Male ☐ Female ☐

Country of Residence:

How many modules have the taken so far, including current ones?

Please respond to the following statements indicating your degree of satisfaction or dissatisfaction with the following statements:

How satisfied are you with the following aspects :	***Strongly dissatisfied***	***Dissatisfied***	***Neither dissatisfied or satisfied***	***Satisfied***	***Strongly satisfied***
1. Academic Personnel					
1.8. Educational skills	1	2	3	4	5

1.9. Preparation adequacy	1	2	3	4	5
1.10. Ability to transmit knowledge and to motivate	1	2	3	4	5
1.11. Support in academic related areas and providing feedback	1	2	3	4	5
1.12. Promoting advanced knowledge	1	2	3	4	5
1.13. Communication between teaching staff and students	1	2	3	4	5
1.14. Behavior, caring and willingness to provide assistance	1	2	3	4	5
How would you rank your overall satisfaction regarding Academic Personnel	1	2	3	4	5
To what extend your expectation regarding Academic Personnel have been met.	Very below expectations	Did not meet expectations	As expected	Above expectations	Greatly exceeded expectations

2. Content of the programme

2.1. Meeting my needs	1	2	3	4	5
2.2. Right extend of depth and scope	1	2	3	4	5

2.3. Proper balance between theory and practice	1	2	3	4	5
2.4. Appropriate study workload	1	2	3	4	5
2.5. Overall design and delivery of the programme	1	2	3	4	5
2.6. Adequate and specific information before enrolling	1	2	3	4	5
How would you rank your overall satisfaction regarding the content of your Programme	1	2	3	4	5

To what extend your expectation regarding the content of your Programme have been met.	Very below expectations	Did not meet expectations	As expected	Above expectations	Greatly exceeded expectations

3. Educational Process

3.1. Organization of the study process (curriculum, structure, timetable – web-conference scheduling etc.)	1	2	3	4	5
3.2. Study material and tools	1	2	3	4	5
3.3. Educational approach & activities	1	2	3	4	5

3.4. Assessment & evaluation methods and processes	1	2	3	4	5
How would you rank your overall satisfaction regarding the Educational Process	1	2	3	4	5

To what extend your expectation regarding the Educational Process has been met.	Very below expectations	Did not meet expectations	As expected	Above expectations	Greatly exceeded expectations

4. Infrastructure and Support Services

4.1. Administrative service: (Correspondence, knowledge, service speed, willingness to provide assistance)	1	2	3	4	5
4.2. Library facilities (Availability of reference books, easiness of books searching)	1	2	3	4	5
4.3. IT and e-learning facilities: e-class platform	1	2	3	4	5
4.4. IT and e-learning facilities: web-conference platform	1	2	3	4	5
4.5. IT and e-learning facilities: email	1	2	3	4	5

4.6. IT and e-learning facilities: administration					
How would you rank your overall satisfaction regarding the Infrastructure & Support Services	1	2	3	4	5
To what extend your expectation regarding the Infrastructure & Support Services have been met.	Very below expectations	Did not meet expectations	As expected	Above expectations	Greatly exceeded expectations

5. Based on the above, how would you rank overall your Learning Experience

5.1. Specific Knowledge and skills acquired	1	2	3	4	5
5.2. Relativity to labor market	1	2	3	4	5
5.3. Prospects for future advancement	1	2	3	4	5
5.4. How satisfied are you with your distance learning education experience, compared with your previous conventional education; (answer only if applies)	1	2	3	4	5

Appendix B
Contingency Analysis

The results of contingency analysis of chapter 5 are presented below for each variable:

B.1 Gender

Hypothesis:

H_0: Satisfaction with academic personnel (overall) is independent of Gender

H_A: Satisfaction with academic personnel (overall) is not independent of Gender

Observed	Satisfaction with academic personnel			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	6	25	19	50
Female	13	44	48	105
total	19	69	67	155

Expected	Satisfaction with academic personnel			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	6,129	22,258	21,613	50
Female	12,871	46,742	45,387	105
total	19	69	67	155

p-value = 0,61602328 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the content (overall) is independent of Gender

H_A: Satisfaction with the content(overall) is not independent of Gender

Observed	Satisfaction with content			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	4	26	20	50
Female	20	45	40	105
total	24	71	60	155

Expected	Satisfaction with content			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	7,742	22,903	19,355	50
Female	16,258	48,097	40,645	105
total	24	71	60	155

p-value = 0,190168 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the process (overall) is independent of Gender

H_A: Satisfaction with the process (overall) is not independent of Gender

Observed	Satisfaction with educational process			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	7	25	18	50
Female	20	42	42	104
total	27	67	60	154

Expected	Satisfaction with educational process			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	8,766	21,753	19,481	50
Female	18,234	45,247	40,519	104
total	27	67	60	154

p-value = 0,493829 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with infrastructure (overall) is independent of Gender

H_A: Satisfaction with infrastructure (overall) is not independent of Gender

Observed	Satisfaction with infrastructure and support			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	13	21	16	50
Female	18	52	35	105
total	31	73	51	155

Expected	Satisfaction with infrastructure and support			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	10,000	23,548	16,452	50
Female	21,000	49,452	34,548	105
total	31	73	51	155

p-value = 0,416033 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with Knowledge/skills acquired is independent of Gender

H_A: OVERALL Satisfaction with Knowledge/skills acquired NOT independent of Gender

Observed	OVERALL Satisfaction with Knowledge and skills acquired			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	3	24	23	50
Female	8	49	48	105
total	11	73	71	155

Expected	OVERALL Satisfaction with Knowledge and skills acquired			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	3,548	23,548	22,903	50
Female	7,452	49,452	48,097	105
total	11	73	71	155

p-value = 0,933095 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with relativity to labor market is independent of Gender

H_A: OVERALL Satisfaction with relativity to labor market NOT independent of Gender

Observed	OVERALL Satisfaction with Relativity to labor market			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	4	24	22	50
Female	15	50	40	105
total	19	74	62	155

Observed	OVERALL Satisfaction with Relativity to labor market			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	6,129	23,871	20,000	50
Female	12,871	50,129	42,000	105
total	19	74	62	155

p-value = 0,49957452 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with future advancement is independent of Gender

H_A: OVERALL Satisfaction with future advancement NOT independent of Gender

Observed	OVERALL Satisfaction with future advancement			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	5	21	24	50
Female	11	55	39	105
total	16	76	63	155

Observed	OVERALL Satisfaction with future advancement			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	5,161	24,516	20,323	50
Female	10,839	51,484	42,677	105
total	16	76	63	155

p-value = 0,420173 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with academic personnel is independent of Gender

H_A: EXPECTATION with academic personnel is not independent of Gender

Observed	EXPECTATION with academic personnel			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	9	22	19	50
Female	18	45	42	105
total	27	67	61	155

Observed	EXPECTATION with academic personnel			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	8,710	21,613	19,677	50
Female	18,290	45,387	41,323	105
total	27	67	61	155

p-value = 0,97095686 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the content is independent of Gender

H_A: EXPECTATION with the content is not independent of Gender

Observed	EXPECTATION with content			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	5	26	19	50
Female	27	37	41	105
total	32	63	60	155

Expected	EXPECTATION with content			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	10,323	20,323	19,355	50
Female	21,677	42,677	40,645	105
total	32	63	60	155

p-value = 0,040716 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the process is independent of Gender

H_A: EXPECTATION with the process is not independent of Gender

Observed	EXPECTATION with process			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	8	28	14	50
Female	24	44	37	105
total	32	72	51	155

Expected	EXPECTATION with process			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	10,323	23,226	16,452	50
Female	21,677	48,774	34,548	105
total	32	72	51	155

p-value = 0,251652 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with infrastructure is independent of Gender

H_A: EXPECTATION with infrastructure is not independent of Gender

Observed	EXPECTATION with infrastructure and support			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	14	20	16	50
Female	20	52	33	105
total	34	72	49	155

Expected	EXPECTATION with infrastructure and support			
GENDER	Not satisfied	Satisfied	Very satisfied	total
Male	10,968	23,226	15,806	50
Female	23,032	48,774	33,194	105
total	34	72	49	155

p-value = 0,386275 =>Not reject hypothesis

B.2 Country

Hypothesis:

H_0: Satisfaction with academic personnel (overall) is independent of Country

H_A: Satisfaction with academic personnel (overall) is not independent of Country

Observed	Satisfaction with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	8	28	23	59
GR	10	38	44	92
other	1	3	0	4
total	19	69	67	155

Expected	Satisfaction with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	7,232	26,265	25,503	59
GR	11,277	40,955	39,768	92
other	0,490	1,781	1,729	4
total	19	69	67	155

p-value = 0,361448 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the content (overall) is independent of Country

H_A: Satisfaction with the content(overall) is not independent of Country

Observed	Satisfaction with content			
country	Not satisfied	Satisfied	Very satisfied	total
CY	10	23	26	59
GR	13	46	33	92
other	1	2	1	4
total	24	71	60	155

Expected	Satisfaction with content			
country	Not satisfied	Satisfied	Very satisfied	total
CY	9,135	27,026	22,839	59
GR	14,245	42,142	35,613	92
other	0,619	1,832	1,548	4
total	24	71	60	155

p-value = 0,696038 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the process (overall) is independent of Country

H_A: Satisfaction with the process (overall) is not independent of Country

Observed	Satisfaction with process			
country	Not satisfied	Satisfied	Very satisfied	total
CY	10	31	18	59
GR	15	35	42	92
other	2	2	0	4
total	27	68	60	155

Expected	Satisfaction with process			
country	Not satisfied	Satisfied	Very satisfied	total
CY	10,277	25,884	22,839	59
GR	16,026	40,361	35,613	92
other	0,697	1,755	1,548	4
total	27	68	60	155

p-value = 0,092042 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with infrastructure (overall) is independent of Country

H_A: Satisfaction with infrastructure (overall) is not independent of Country

Observed	Satisfaction with infrastructure and support			
country	Not satisfied	Satisfied	Very satisfied	total
CY	12	29	18	59
GR	18	41	33	92
other	1	3	0	4
total	31	73	51	155

Expected	Satisfaction with infrastructure and support			
country	Not satisfied	Satisfied	Very satisfied	total
CY	11,800	27,787	19,413	59
GR	18,400	43,329	30,271	92
other	0,800	1,884	1,316	4
total	31	73	51	155

p-value = 0,632772 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with Knowledge/skills acquired is independent of Country

H_A: OVERALL Satisfaction with Knowledge/skills acquired is not independent of Country

Observed	Overall Satisfaction with Knowledge/skills acquired			
country	Not satisfied	Satisfied	Very satisfied	total
CY	5	28	26	59
GR	5	44	43	92
other	1	1	2	4
total	11	73	71	155

Expected	Overall Satisfaction with Knowledge/skills acquired			
country	Not satisfied	Satisfied	Very satisfied	total
CY	4,187	27,787	27,026	59
GR	6,529	43,329	42,142	92
other	0,284	1,884	1,832	4
total	11	73	71	155

p-value = 0,588216 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with relativity to labor market is independent of Country

H_A: OVERALL Satisfaction with relativity to labor market is not independent of Country

Observed	Overall Satisfaction with Relativity to labor market			
country	Not satisfied	Satisfied	Very satisfied	total
CY	6	30	23	59
GR	13	41	38	92
other	0	3	1	4
total	19	74	62	155

Expected	Overall Satisfaction with Relativity to labor market			
country	Not satisfied	Satisfied	Very satisfied	total
CY	7,232	28,168	23,600	59
GR	11,277	43,923	36,800	92
other	0,490	1,910	1,600	4
total	19	74	62	155

p-value = 0,702885 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with future advancement is independent of Country

H_A: OVERALL Satisfaction with future advancement is not independent of Country

Observed	Overall Satisfaction with future advancement			
country	Not satisfied	Satisfied	Very satisfied	total
CY	9	23	27	59
GR	6	52	34	92
other	1	1	2	4
total	16	76	63	155

Expected	Overall Satisfaction with future advancement			
country	Not satisfied	Satisfied	Very satisfied	total
CY	6,090	28,929	23,981	59
GR	9,497	45,110	37,394	92
other	0,413	1,961	1,626	4
total	16	76	63	155

p-value = 0,134548 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with academic personnel is independent of Country

H_A: EXPECTATION with academic personnel is not independent of Country

Observed	EXPECTATION with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	12	23	24	59
GR	13	42	37	92
other	2	2	0	4
total	27	67	61	155

Expected	Satisfaction with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	10,277	25,503	23,219	59
GR	16,026	39,768	36,206	92
other	0,697	1,729	1,574	4
total	27	67	61	155

p-value = 0,25519 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the content is independent of Country

H_A: EXPECTATION with the content is not independent of Country

Observed EXP with process

country	Not satisfied	Satisfied	Very satisfied	total
CY	14	28	17	59
GR	16	42	34	92
other	2	2	0	4
total	32	72	51	155

Expected EXP with process

country	Not satisfied	Satisfied	Very satisfied	total
CY	12,181	27,406	19,413	59
GR	18,994	42,735	30,271	92
other	0,826	1,858	1,316	4
total	32	72	51	155

p-value = 0,339608 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with infrastructure is independent of Country

H_A: EXPECTATION with infrastructure is not independent of Country

Observed Satisfaction with the infrastructure and support

country	Not satisfied	Satisfied	Very satisfied	total
CY	13	25	21	59
GR	20	44	28	92
other	1,000	3	0	4
total	34	72	49	155

Expected Satisfaction with the infrastructure and support

country	Not satisfied	Satisfied	Very satisfied	total
CY	12,942	27,406	18,652	59
GR	20,181	42,735	29,084	92
other	0,877	1,858	1,265	4
total	34	72	49	155

p-value = 0,632125 =>Not reject hypothesis

B.3 Faculty

Hypothesis:

H_0: Satisfaction with academic personnel (overall) is independent of Faculty

H_A: Satisfaction with academic personnel (overall) is not independent of Faculty

Observed	Satisfaction with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	1	9	17	27
PAS	2	14	30	46
EM	16	46	20	82
total	19	69	67	155

Expected	Satisfaction with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	3,310	12,019	11,671	27
PAS	5,639	20,477	19,884	46
EM	10,052	36,503	35,445	82
total	19	69	67	155

p-value = 1,92562E-05 =>Reject hypothesis

Hypothesis:

H_0: Satisfaction with the content (overall) is independent of Faculty

H_A: Satisfaction with the content(overall) is not independent of Faculty

Observed	Satisfaction with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	0	14	13	27
PAS	5	17	24	46
EM	19	40	23	82
total	24	71	60	155

Expected	Satisfaction with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	4,181	12,368	10,452	27
PAS	7,123	21,071	17,806	46
EM	12,697	37,561	31,742	82
total	24	71	60	155

p-value = 0,006436 =>Reject hypothesis

Hypothesis:

H_0: Satisfaction with the process (overall) is independent of Faculty

H_A: Satisfaction with the process (overall) is not independent of Faculty

Observed	Satisfaction with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	2	12	13	27
PAS	4	15	27	46
EM	21	41	20	82
total	27	68	60	155

Expected	Satisfaction with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	4,703	11,845	10,452	27
PAS	8,013	20,181	17,806	46
EM	14,284	35,974	31,742	82
total	27	68	60	155

p-value = 0,001 =>Reject hypothesis

Hypothesis:

H_0: Satisfaction with infrastructure (overall) is independent of Faculty

H_A: Satisfaction with infrastructure (overall) is not independent of Faculty

Observed	Satisfaction with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	3	16	8	27
PAS	6	14	26	46
EM	22	43	17	82
total	31	73	51	155

Expected	Satisfaction with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	5,400	12,716	8,884	27
PAS	9,200	21,665	15,135	46
EM	16,400	38,619	26,981	82
total	31	73	51	155

p-value = 0,000565 =>Reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with knowledge/skills acquired is independent of Faculty

H_A: OVERALL Satisfaction with knowledge/skills acquired is not independent of Faculty

Observed	Overall Satisfaction with Knowledge/skills acquired			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	0	8	19	27
PAS	0	17	29	46
EM	11	48	23	82
total	11	73	71	155

Expected	Overall Satisfaction with Knowledge/skills acquired			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	1,916	12,716	12,368	27
PAS	3,265	21,665	21,071	46
EM	5,819	38,619	37,561	82
total	11	73	71	155

p-value = 1,98E-05 =>Reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with relativity to labor market is independent of Faculty

H_A: OVERALL Satisfaction with relativity to labor market is not independent of Faculty

Observed	Overall Satisfaction with Relativity to labor market			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	0	11	16	27
PAS	2	17	27	46
EM	17	46	19	82
total	19	74	62	155

Expected	Overall Satisfaction with Relativity to labor market			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	3,310	12,890	10,800	27
PAS	5,639	21,961	18,400	46
EM	10,052	39,148	32,800	82
total	19	74	62	155

p-value = 4,2E-05 =>Reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with future advancement is independent of Faculty

H_A: OVERALL Satisfaction with future advancement is not independent of Faculty

Observed	Overall Satisfaction with future advancement			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	1	12	14	27
PAS	1	17	28	46
EM	14	47	21	82
total	16	76	63	155

Expected	Overall Satisfaction with future advancement			
faculty	Not satisfied	Satisfied	Very satisfied	total
HSS	2,787	13,239	10,974	27
PAS	4,748	22,555	18,697	46
EM	8,465	40,206	33,329	82
total	16	76	63	155

p-value = 0,00042 =>Reject hypothesis

Hypothesis:

H_0: EXPECTATION with academic personnel is independent of Faculty

H_A: EXPECTATION with academic personnel is not independent of Faculty

Observed	EXPECTATION with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	1	13	13	27
GR	2	17	27	46
other	24	37	21	82
total	27	67	61	155

Expected	EXPECTATION with academic personnel			
country	Not satisfied	Satisfied	Very satisfied	total
CY	4,703	11,671	10,626	27
GR	8,013	19,884	18,103	46
other	14,284	35,445	32,271	82
total	27	67	61	155

p-value = 9,99372E-05 =>Reject hypothesis

Hypothesis:

H_0: EXPECTATION with the content is independent of Faculty

H_A: EXPECTATION with the content is not independent of Faculty

Observed	EXPECTATION with content			
country	Not satisfied	Satisfied	Very satisfied	total
CY	1	14	12	27
GR	8	18	20	46
other	23	31	28	82
total	32	63	60	155

Expected	EXPECTATION with content			
country	Not satisfied	Satisfied	Very satisfied	total
CY	5,574	10,974	10,452	27
GR	9,497	18,697	17,806	46
other	16,929	33,329	31,742	82
total	32	63	60	155

p-value = 0,086918 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the process is independent of Faculty

H_A: EXPECTATION with the process is not independent of Faculty

Observed	EXPECTATION with process			
country	Not satisfied	Satisfied	Very satisfied	total
CY	2	17	8	27
GR	5	19	22	46
other	25	36	21	82
total	32	72	51	155

Expected	EXPECTATION with process			
country	Not satisfied	Satisfied	Very satisfied	total
CY	5,574	12,542	8,884	27
GR	9,497	21,368	15,135	46
other	16,929	38,090	26,981	82
total	32	72	51	155

p-value = 0,005231 =>Reject hypothesis

Hypothesis:

H_0: EXPECTATION with infrastructure is independent of Faculty

H_A: EXPECTATION with infrastructure is not independent of Faculty

Observed	EXPECTATION with the infrastructure and support			
country	Not satisfied	Satisfied	Very satisfied	total
CY	4	16	7	27
GR	7	15	24	46
other	23	41	18	82
total	34	72	49	155

Expected	EXPECTATION with the infrastructure and support			
country	Not satisfied	Satisfied	Very satisfied	total
CY	5,923	12,542	8,535	27
GR	10,090	21,368	14,542	46
other	17,987	38,090	25,923	82
total	34	72	49	155

p-value = 0,004935 =>Reject hypothesis

B.4 Modules

Hypothesis:

H_0: Satisfaction with academic personnel (overall) is independent of modules

H_A: Satisfaction with academic personnel (overall) is not independent of modules

Observed	Satisfaction with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	4	19	24	47
4-6 mod	13	40	34	87
7-9 mod	2	8	7	17
10+ mod	0	2	2	4
total	19	69	67	155

Expected	Satisfaction with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	5,761	20,923	20,316	47
4-6 mod	10,665	38,729	37,606	87
7-9 mod	2,084	7,568	7,348	17
10+ mod	0,490	1,781	1,729	4
total	19	69	67	155

p-value = 0,822949 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the content (overall) is independent of modules

H_A: Satisfaction with the content(overall) is not independent of modules

Observed	Satisfaction with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	8	20	19	47
4-6 mod	14	43	30	87
7-9 mod	2	8	7	17
10+ mod	0	0	4	4
total	24	71	60	155

Expected	Satisfaction with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	7,277	21,529	18,194	47
4-6 mod	13,471	39,852	33,677	87
7-9 mod	2,632	7,787	6,581	17
10+ mod	0,619	1,832	1,548	4
total	24	71	60	155

p-value = 0,285019 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with the process (overall) is independent of modules

H_A: Satisfaction with the process (overall) is not independent of modules

Observed	Satisfaction with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	8	23	16	47
4-6 mod	17	35	35	87
7-9 mod	2	10	5	17
10+ mod	0	0	4	4
total	27	68	60	155

Expected	Satisfaction with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	8,187	20,619	18,194	47
4-6 mod	15,155	38,168	33,677	87
7-9 mod	2,961	7,458	6,581	17
10+ mod	0,697	1,755	1,548	4
total	27	68	60	155

p-value = 0,175015 =>Not reject hypothesis

Hypothesis:

H_0: Satisfaction with infrastructure (overall) is independent of modules

H_A: Satisfaction with infrastructure (overall) is not independent of modules

Observed	Satisfaction with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	6	26	15	47
4-6 mod	20	38	29	87
7-9 mod	4	9	4	17
10+ mod	1	0	3	4
total	31	73	51	155

Expected	Satisfaction with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	9,400	22,135	15,465	47
4-6 mod	17,400	40,974	28,626	87
7-9 mod	3,400	8,006	5,594	17
10+ mod	0,800	1,884	1,316	4
total	31	73	51	155

p-value = 0,294069 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with knowledge/skills acquired is independent of modules

H_A: OVERALL Satisfaction with knowledge/skills acquired is not independent of modules

Observed	OVERALL Satisfaction with Knowledge/skills acquired			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	0	25	22	47
4-6 mod	9	43	35	87
7-9 mod	2	5	10	17
10+ mod	0	0	4	4
total	11	73	71	155

Expected	OVERALL Satisfaction with Knowledge/skills acquired			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	3,335	22,135	21,529	47
4-6 mod	6,174	40,974	39,852	87
7-9 mod	1,206	8,006	7,787	17
10+ mod	0,284	1,884	1,832	4
total	11	73	71	155

p-value = 0,047831 =>Reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with relativity to labor market is independent of modules

H_A: OVERALL Satisfaction with relativity to labor market is not independent of modules

Observed	OVERALL Satisfaction with Relativity to labor market			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	2	25	20	47
4-6 mod	13	42	32	87
7-9 mod	4	6	7	17
10+ mod	0	1	3	4
total	19	74	62	155

Expected	OVERALL Satisfaction with Relativity to labor market			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	5,761	22,439	18,800	47
4-6 mod	10,665	41,535	34,800	87
7-9 mod	2,084	8,116	6,800	17
10+ mod	0,490	1,910	1,600	4
total	19	74	62	155

p-value = 0,235576 =>Not reject hypothesis

Hypothesis:

H_0: OVERALL Satisfaction with future advancement is independent of modules

H_A: OVERALL Satisfaction with future advancement is not independent of modules

Observed	OVERALL Satisfaction with future advancement			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	4	19	24	47
4-6 mod	10	49	28	87
7-9 mod	2	7	8	17
10+ mod	0	1	3	4
total	16	76	63	155

Expected	OVERALL Satisfaction with future advancement			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	4,852	23,045	19,103	47
4-6 mod	8,981	42,658	35,361	87
7-9 mod	1,755	8,335	6,910	17
10+ mod	0,413	1,961	1,626	4
total	16	76	63	155

p-value = 0,305272 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with academic personnel is independent of modules

H_A: EXPECTATION with academic personnel is not independent of modules

Observed	EXPECTATION with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	5	20	22	47
4-6 mod	20	37	30	87
7-9 mod	2	9	6	17
10+ mod	0	1	3	4
total	27	67	61	155

Expected	EXPECTATION with academic personnel			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	8,187	20,316	18,497	47
4-6 mod	15,155	37,606	34,239	87
7-9 mod	2,961	7,348	6,690	17
10+ mod	0,697	1,729	1,574	4
total	27	67	61	155

p-value = 0,316912 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the content is independent of modules

H_A: EXPECTATION with the content is not independent of modules

Observed	EXPECTATION with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	10	20	17	47
4-6 mod	19	37	31	87
7-9 mod	3	6	8	17
10+ mod	0	0	4	4
total	32	63	60	155

Expected	EXPECTATION with content			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	9,703	19,103	18,194	47
4-6 mod	17,961	35,361	33,677	87
7-9 mod	3,510	6,910	6,581	17
10+ mod	0,826	1,626	1,548	4
total	32	63	60	155

p-value = 0,29299 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with the process is independent of modules

H_A: EXPECTATION with the process is not independent of modules

Observed	EXPECTATION with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	11	19	17	47
4-6 mod	19	43	25	87
7-9 mod	2	9	6	17
10+ mod	0	1	3	4
total	32	72	51	155

Expected	EXPECTATION with process			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	9,703	21,832	15,465	47
4-6 mod	17,961	40,413	28,626	87
7-9 mod	3,510	7,897	5,594	17
10+ mod	0,826	1,858	1,316	4
total	32	72	51	155

p-value = 0,470933 =>Not reject hypothesis

Hypothesis:

H_0: EXPECTATION with infrastructure is independent of modules

H_A: EXPECTATION with infrastructure is not independent of modules

Observed	EXPECTATION with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	8	24	15	47
4-6 mod	21	39	27	87
7-9 mod	4	8	5	17
10+ mod	1	1	2	4
total	34	72	49	155

Expected	EXPECTATION with infrastructure and support			
faculty	Not satisfied	Satisfied	Very satisfied	total
1-3 mod	10,310	21,832	14,858	47
4-6 mod	19,084	40,413	27,503	87
7-9 mod	3,729	7,897	5,374	17
10+ mod	0,877	1,858	1,265	4
total	34	72	49	155

p-value = 0,930976 =>Not reject hypothesis

Appendix C
Regression analysis tables

The results of regression analysis of chapter 5 are presented below:

C.1 Input criteria

Regression analysis for the main criteria is presented below.

C.1.1 Academic personnel

Y= overall satisfaction with academic personnel
Xi: satisfaction with the i-th sub-criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6+b7.X7

Ho: b1=b2=b3=b4=b5=b6=b7=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,829212956
R Square	0,687594127
Adjusted R Square	0,672717657
Standard Error	0,40805242
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	53,8718908	7,6959844	46,220247	4,2803E-34
Residual	147	24,47649629	0,1665068		
Total	154	78,3483871			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	0,62607068	0,235983897	2,6530229	0,0088544	0,15971144	1,0924299	0,15971144	1,09242992
1.1 skills	0,169082946	0,082202236	2,0569142	0,0414622	0,00663215	0,3315337	0,00663215	0,33153374

1.2 Preparation	0,109318163	0,079974775	1,366908	0,1737409	-0,04873065	0,267367	-0,04873065	0,26736698
1.3 transmit knowledge	0,211953286	0,066527032	3,1859724	0,0017621	0,08048035	0,3434262	0,08048035	0,34342622
1.4 support	0,0625756	0,070577366	0,8866242	0,3767295	-0,07690174	0,2020529	-0,07690174	0,20205294
1.5 promoting knowledge	0,147809702	0,065447114	2,2584602	0,0253888	0,01847093	0,2771485	0,01847093	0,27714847
1.6 communication	0,254602472	0,063577597	4,0045942	9,827E-05	0,12895831	0,3802466	0,12895831	0,38024664
1.7 behavior	-0,089235088	0,076316853	-1,169271	0,2441869	-0,24005499	0,0615848	-0,24005499	0,06158482

There is sufficient evidence to reject Ho. Not all the coefficients are equal to zero. In particular, b0, b1, b3, b5, b6 are statistically significant and thus, academic personnel's *skills*, *ability to transmit knowledge* and *promote knowledge*; and communication are significantly related with students' satisfaction with academic personnel.

The *Significance F* is 4,2803E-34 and thus, the model is significant.

$R^2 = 0{,}687594127 \approx 69\%$. That means that 69% of the variation in satisfaction with academic personnel is explained by variation in satisfaction with the significant variables.

VALIDATION:

Regression Statistics	
Multiple R	0.8242631
R Square	0.67940965
Adjusted R Square	0.67086058
Standard Error	0.40920848
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	53.2306504	13.307663	79.471706	4.5911E-36
Residual	150	25.1177367	0.1674516		
Total	154	78.3483871			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.65514657	0.21518402	3.0445875	0.00275261	0.22996334	1.0803298	0.2299633	1.0803298
1.1 skills	0.22196029	0.07524993	2.949641	0.00369202	0.07327355	0.370647	0.0732735	0.370647
1.3 transmit knowledge	0.24981556	0.06254609	3.9941039	0.00010141	0.12623042	0.3734007	0.1262304	0.3734007
1.5 promoting knowledge	0.14008476	0.06288247	2.2277235	0.02738744	0.01583495	0.2643346	0.015835	0.2643346
1.6 communication	0.24354373	0.05316886	4.5805709	9.6803E-06	0.1384871	0.3486004	0.1384871	0.3486004

C.1.2 Content of the programme

Y= overall satisfaction with content of the programme
Xi: satisfaction with the i-th sub-criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6

Ho: b1=b2=b3=b4=b5=b6=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.854289356
R Square	0.729810303
Adjusted R Square	0.718856667
Standard Error	0.423394305
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	71.66266329	11.943777	66.627217	1.346E-39
Residual	148	26.53088509	0.1792627		
Total	154	98.19354839			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.743609813	0.19238638	3.8651895	0.0001657	0.36343077	1.1237889	0.36343077	1.12378886
2.1 meeting needs	0.250362578	0.068814516	3.6382233	0.0003785	0.11437667	0.3863485	0.11437667	0.38634849
2.2 depth-scope	0.023501533	0.073527767	0.319628	0.7497011	-0.12179834	0.1688014	-0.12179834	0.1688014
2.3 balance	0.020552698	0.05214724	0.3941282	0.6940537	-0.08249663	0.123602	-0.08249663	0.12360203
2.4 workload	0.033957986	0.059746218	0.5683705	0.5706448	-0.08410786	0.1520238	-0.08410786	0.15202383
2.5 design	0.351864214	0.074765107	4.7062624	5.744E-06	0.20411921	0.4996092	0.20411921	0.49960922
2.6 info before enrolling	0.173268234	0.045983715	3.7680347	0.000237	0.08239878	0.2641377	0.08239878	0.26413769

There is sufficient evidence to reject Ho. In particular, b0, b1, b5, b6 are statistically significant. There is significant linear relationship between students' satisfaction with content and satisfaction with *design and delivery* of the content, extend of *meeting students' needs* and *availability of information before enrolling*.

The *Significance F* is 1.346E-39 and thus, the model is significant.

$R^2 = 0.729810303 \approx 73\%$. That means that 73% of the variation in satisfaction with the content of the programme is explained by variation in satisfaction with the significant variables.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.853386
R Square	0.7282676

Adjusted R Square	0.722869
Standard Error	0.4203622
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	71.511184	23.837061	134.89795	1.6E-42
Residual	151	26.6823644	0.1767044		
Total	154	98.1935484			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.7998432	0.17538649	4.5604607	1.048E-05	0.453315	1.1463716	0.4533147	1.1463716
2.1 meeting needs	0.2677795	0.06136152	4.3639645	2.357E-05	0.146541	0.3890175	0.1465415	0.3890175
2.5 design	0.388761	0.06108378	6.3643904	2.224E-09	0.268072	0.5094503	0.2680717	0.5094503
2.6 info before enrolling	0.1799166	0.0446973	4.0252229	8.978E-05	0.091604	0.2682294	0.0916037	0.2682294

C.1.3 Educational process

Y= overall satisfaction with educational process
Xi: satisfaction with the i-th sub-criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4

Ho: b1=b2=b3=b4=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.831454
R Square	0.691316
Adjusted R Square	0.683084
Standard Error	0.422641
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	60.00621393	15.00155348	83.98339137	2.733E-37
Residual	150	26.79378607	0.17862524		
Total	154	86.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.633813	0.204296082	3.102424861	0.002294095	0.2301435	1.037483	0.23014353	1.037483
3.1 organization	0.227671	0.05689109	4.001869686	9.84508E-05	0.1152593	0.3400821	0.11525932	0.3400821
3.2 study material	0.089149	0.061860494	1.441132954	0.151631415	-0.033081	0.2113797	-0.03308128	0.2113797

3.3 approach	0.282594	0.071442903	3.955518898	0.000117421	0.1414293	0.4237582	0.14142934	0.4237582
3.4 assessment	0.268328	0.078170311	3.432602699	0.000772834	0.1138705	0.4227848	0.11387049	0.4227848

Ho is rejected because b0, b1, b3, b4 are statistically significant. There is evidence of significant linear relationship between students' satisfaction with educational process and satisfaction with *organization* of the process, *educational approach-activities* and *assessment and evaluation methods*.

The *Significance F* is 2.733E-37 and thus, the model is significant.

$R^2 = 0.691316 \approx 69\%$. That means that 69% of the variation in satisfaction with educational process is explained by variation in satisfaction with the significant variables.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.8288799
R Square	0.6870419
Adjusted R Square	0.6808241
Standard Error	0.4241452
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	59.635234	19.878411	110.49755	6.646E-38
Residual	151	27.164766	0.1798991		
Total	154	86.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.6132951	0.2045248	2.9986347	0.0031725	0.2091953	1.0173949	0.2091953	1.017395
3.1 organization	0.2611525	0.0521158	5.0110028	1.496E-06	0.1581821	0.3641229	0.1581821	0.364123
3.3 approach	0.3007563	0.0705728	4.2616449	3.558E-05	0.1613186	0.4401939	0.1613186	0.440194
3.4 assessment	0.3092769	0.0730823	4.2318987	4.006E-05	0.164881	0.4536729	0.164881	0.453673

C.1.4 Infrastructure & support services

Y= overall satisfaction with Infrastructure and support services
Xi: satisfaction with the i-th sub-criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4+b5.X5+b6.X6

Ho: b1=b2=b3=b4=b5=b6=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.890761307
R Square	0.793455707
Adjusted R Square	0.785082289
Standard Error	0.404693513
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	93.11586646	15.519311	94.758887	3.6973E-48
Residual	148	24.23897224	0.1637768		
Total	154	117.3548387			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.119423127	0.204571142	0.5837731	0.5602616	-0.2848345	0.5236808	-0.2848345	0.52368075
4.1 Admin service	0.352652637	0.053208366	6.6277667	5.946E-10	0.24750639	0.4577989	0.24750639	0.45779888
4.2 Library	0.003661167	0.044435828	0.0823922	0.9344461	-0.08414947	0.0914718	-0.08414947	0.0914718
4.3 e-class platform	-0.085310708	0.075545635	-1.129261	0.2606149	-0.23459813	0.0639767	-0.23459813	0.06397672
4.4 web-conference platform	0.191227525	0.073824416	2.5903019	0.0105477	0.04534144	0.3371136	0.04534144	0.33711361
4.5 email	0.048305459	0.072190015	0.6691432	0.5044466	-0.09435085	0.1909618	-0.09435085	0.19096177
4.6 administration	0.439528342	0.071670682	6.13261	7.5E-09	0.2978983	0.5811584	0.2978983	0.58115839

The results show that b1, b4, b6 are statistically significant and Ho is rejected. There is a significant linear relationship between students' satisfaction with infrastructure and support services and satisfaction with *administrative service*, *web-conference platform* and *administration*.

The *Significance F* is 3.6973E-48 and thus, the model is significant.

$R^2 = 0.793455707 \approx 79\%$. That means that 79% of the variation in satisfaction with infrastructure and support services is explained by variation in satisfaction with the significant variables.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.8896132
R Square	0.7914117
Adjusted R Square	0.7872676
Standard Error	0.4026308

Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	92.875992	30.958664	190.97135	3.547E-51
Residual	151	24.478847	0.1621116		
Total	154	117.35484			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.1371754	0.1725049	0.7951972	0.427747	-0.20366	0.47801	-0.20366	0.47801
4.1 Admin service	0.3513303	0.0523546	6.7105872	3.666E-10	0.2478881	0.454772	0.247888	0.454772
4.4 web-conference platform	0.1524393	0.0535612	2.8460757	0.0050418	0.0466131	0.258266	0.046613	0.258266
4.6 administration	0.4414304	0.0692524	6.3742257	2.114E-09	0.3046016	0.578259	0.304602	0.578259

C. 2 Output criteria

Regression analysis for the output criteria is presented below.

C.2.1 OVERALL satisfaction with Specific Knowledge and skills acquired

Y= overall satisfaction with Specific Knowledge and skills acquired
Xi: satisfaction with the i-th criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4

Ho: b1=b2=b3=b4=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.808412
R Square	0.653531
Adjusted R Square	0.644292
Standard Error	0.368451
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	38.41074	9.602685	70.7347	1.49E-33
Residual	150	20.36345	0.135756		
Total	154	58.77419			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.324108	0.192711	6.870964	1.59E-10	0.94333	1.704886	0.94333	1.704886
1.8 OVERALL	0.158743	0.063519	2.499122	0.013527	0.033234	0.284251	0.033234	0.284251
2.7 OVERALL	0.146583	0.057357	2.555622	0.011595	0.033251	0.259915	0.033251	0.259915
3.5 OVERALL	0.458141	0.065566	6.987476	8.54E-11	0.328589	0.587694	0.328589	0.587694
4.7 OVERALL	-0.03887	0.050278	-0.7731	0.440679	-0.13821	0.060475	-0.13821	0.060475

There is sufficient evidence to reject Ho. Not all the coefficients are equal to zero. In particular, b0, b1, b2, b3 are statistically significant.

The *Significance F* is 1.49E-33 and thus, the model is significant.

$R^2 = 0.653531 \approx 65\%$. That means that 65% of the variation in satisfaction with Knowledge and skills acquired is explained by variation in satisfaction with the significant variables.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.8075582
R Square	0.6521502
Adjusted R Square	0.6452393
Standard Error	0.3679601
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	38.329601	12.776534	94.365125	1.894E-34
Residual	151	20.444593	0.1353947		
Total	154	58.774194			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.325802	0.1924413	6.8893846	1.418E-10	0.9455767	1.7060272	0.945577	1.706027
1.8 OVERALL	0.1422086	0.059731	2.3808182	0.0185213	0.0241922	0.2602251	0.024192	0.260225
2.7 OVERALL	0.1381059	0.0562241	2.4563469	0.0151691	0.0270184	0.2491935	0.027018	0.249193
3.5 OVERALL	0.4455006	0.06341	7.0257176	6.817E-11	0.3202152	0.570786	0.320215	0.570786

C.2.2 OVERALL satisfaction with Relativity to labor market

Y= overall satisfaction with **Relativity to labor market**

Xi: satisfaction with the i-th criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4

Ho: b1=b2=b3=b4=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.702462
R Square	0.493453
Adjusted R Square	0.479945
Standard Error	0.513739
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	38.56572	9.64143	36.53061	2.67E-21
Residual	150	39.58912	0.263927		
Total	154	78.15484			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.105698	0.2687	4.11499	6.37E-05	0.574772	1.636624	0.574772	1.636624
1.8 OVERALL	0.289954	0.088566	3.273858	0.001317	0.114955	0.464953	0.114955	0.464953
2.7 OVERALL	0.17389	0.079974	2.174331	0.031248	0.015869	0.33191	0.015869	0.33191
3.5 OVERALL	0.351071	0.09142	3.840196	0.000181	0.170433	0.531708	0.170433	0.531708
4.7 OVERALL	-0.07154	0.070104	-1.02043	0.309165	-0.21005	0.066982	-0.21005	0.066982

There is sufficient evidence to reject Ho. Not all the coefficients are equal to zero. In particular, b0, b1, b2, b3 are statistically significant.

The *Significance F* is 2.67E-21 and thus, the model is significant.

$R^2 = 0.493453 \approx 49\%$. That means that only 49% of the variation in satisfaction with relativity to labor market is explained by variation in satisfaction with the significant variables and thus, the model has low explanatory value.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.6999545
R Square	0.4899364
Adjusted R Square	0.4798026
Standard Error	0.5138089

Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	38.290897	12.763632	48.347163	5.851E-22
Residual	151	39.863942	0.2639996		
Total	154	78.154839			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.1088163	0.2687195	4.1262969	6.072E-05	0.5778807	1.639752	0.577881	1.639752
1.8 OVERALL	0.2595243	0.0834066	3.1115547	0.002226	0.0947296	0.424319	0.09473	0.424319
2.7 OVERALL	0.1582891	0.0785097	2.016172	0.0455552	0.0031697	0.313409	0.00317	0.313409
3.5 OVERALL	0.327807	0.0885439	3.7021988	0.000299	0.1528621	0.502752	0.152862	0.502752

C.2.3 OVERALL satisfaction with

Y= overall satisfaction with **future advancement**
Xi: satisfaction with the i-th criterion

Y= b0+b1.X1+b2.X2+b3.X3+b4.X4

Ho: b1=b2=b3=b4=0
Ha: at least one coefficient not equal to zero

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.73988
R Square	0.547422
Adjusted R Square	0.535354
Standard Error	0.477312
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	41.33569	10.33392	45.35872	6.32E-25
Residual	150	34.17399	0.227827		
Total	154	75.50968			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.092151	0.249648	4.374768	2.26E-05	0.598871	1.585432	0.598871	1.585432
1.8 OVERALL	0.263031	0.082287	3.196522	0.001696	0.10044	0.425621	0.10044	0.425621
2.7 OVERALL	0.26982	0.074303	3.631339	0.000386	0.123004	0.416637	0.123004	0.416637
3.5 OVERALL	0.048452	0.084938	0.57044	0.569233	-0.11938	0.216281	-0.11938	0.216281
4.7 OVERALL	0.17875	0.065133	2.744381	0.006803	0.050053	0.307447	0.050053	0.307447

There is sufficient evidence to reject Ho. Not all the coefficients are equal to zero. In particular, b0, b1, b2, b4 are statistically significant.

The *Significance F* is 6.32E-25 and thus, the model is significant.

$R^2 = 0.547422 \approx 55\%$. That means that only 55% of the variation in satisfaction with future advancement is explained by variation in satisfaction with the significant variables.

VALIDATION:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.7392162
R Square	0.5464406
Adjusted R Square	0.5374295
Standard Error	0.4762444
Observations	155

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	41.261553	13.753851	60.640737	8.721E-26
Residual	151	34.248125	0.2268088		
Total	154	75.509677			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.1188223	0.2446821	4.5725549	9.967E-06	0.6353797	1.602265	0.63538	1.602265
1.8 OVERALL	0.2772684	0.0782347	3.5440586	0.0005247	0.1226924	0.431844	0.122692	0.431844
2.7 OVERALL	0.2884186	0.066619	4.3293729	2.711E-05	0.1567928	0.420044	0.156793	0.420044
4.7 OVERALL	0.1880154	0.0629342	2.9874891	0.0032837	0.06367	0.312361	0.06367	0.312361

References

Ahmed, M. and Dar, W.M. (2015) Antecedents of education brand: Analysis of student preferences. *International Journal of Management and Business Research*, 4(2), 561-571.

Aldridge, S. and Rowley, J. (1998) Measuring Customer Satisfaction in Higher Education. *Quality Assurance in Education*. 6(4), 197-204.

Alves, H. and Raposo, M. (2007) Conceptual Model of Student Satisfaction in Higher Education. *Total Quality Management & Business Excellence*, 18(5), 571-588.

Appleton-Knapp, S. and Krentler, K. (2006) Measuring Student Expectations and their Effects on Satisfaction: The Importance of Managing Student Expectation. *Journal of Marketing Education*, 28 (3), 254-264.

Arambewela, R. and Hall, J. (2006) A comparative analysis of international education satisfaction using SERVQUAL. *Journal of Services Research*, 6, 141.

Arbaugh, J. (2014) System, scholar or students?. *Journal of Computer Assisted Learning,* 30, 349-362.

Ashby, J., Sadera, W.A. and McNary, S.W. (2011) Comparing student success between developmental math courses offered online, blended, and face-to-face. *Journal of Interactive Online Learning,* 10(3), 128-140.

Asthana, A. and Biggs, L. (2007) "Students pay more but receive less". Higher Education Division, Australia. *The Observer*, 11.

Babakus, E. and Boller, G. (1992) An empirical assessment of the SERVQUAL scale. *Journal of Business Research*, 24, 253-268.

Baldwin. T. and Blattner, N. (2003) Guarding Against Potential Bias in Student Evaluations: What Every Faculty Member Needs to Know. College Teaching, 51(1), 27-32.

Benjamin, M. and Hollings, A. (1997) Student Satisfaction: Test of an Ecological Model. *Journal of College Student Development*, 38.

Bigne, E., Moliner, M. A. and Sánchez, J. (2003) Perceived quality and satisfaction in multiservice organisations: the case of Spanish public services. *Journal of Services Marketing*, 17(4), 420-442.

Bitner, M.J. (1990) Evaluating service encounters: the effects of physical surroundings and employee responses. *Journal of Marketing*, 54, 69-82.

Blackmore, J., Douglas, A. and Barnes, B. (2006) Measuring student satisfaction at a UK university. *Journal for Quality Assurance in Education*, 14, (3), 251-67.

Brown, T.J., Churchill, G.A. and Peter, J.P. (1993) Improving the measurement of service quality. *Journal of Retailing*, 69(1), 127-39.

Browne, K. and Mitsos, E. (1998) Gender differences in education: the achievement of boys. *Sociology Review*, 27-31.

Cadotte, E. and Turgeon, N. (1988) Key factors in guest satisfaction. The Cornell Hotel and Restaurant Administration Quarterly, 28(4), 44-51.

Callender, C. and Ramsden, P. (2014) *Review of the National Student Survey*.

Chan, L. K., Hui, Y. V., Lo, H. P., Tse, S. K., Tso, G. K.F. and Wu, M. L. (2003) Consumer satisfaction index: new practice and findings. *European Journal of Marketing*, 37(5/6), 872-909.

Chitkushev, L., Vodenska, I. and Zlateva, T. (2014) Digital Learning Impact Factors: Student Satisfaction and Performance in Online Courses. International *Journal of Information and Education Technology*, 4, 356-359.

Clewes, D. (2003) A Student-centred Conceptual Model of Service Quality in Higher Education. *Quality in Higher Education*, 9, 69–85.

Cole, M., Shelley, D. and Swartz, L. (2014) Online instruction, e-learning, and student satisfaction: A three year study. The *International Review of Research in Open and Distributed Learning*, 15(6), 111-131.

Cronin Jr, J., Brady, M. and Hult, T. (2000) Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing,* 76, 193-218.

Cronin. Jr, J. and Taylor, S. (1994) SERVPERF Versus SERVQUAL: Reconciling Performance-Based and Perceptions-Minus-Expectations Measurement of Service Quality. *Journal of Marketing*, 58, 125-131.

Cronin, Jr, J. and Taylor, S. (1992) Measuring Service Quality - A Reexamination And Extension. *Journal of Marketing*, 56(3), 55-68.

Curry, A. (1999) Innovation in public service management. *Managing Service Quality*, 9(3), 180-190.

Customers Satisfaction Council (1995) *Customer Satisfaction Assessment Guide*, Motorola University Press.

Cuthbert, P. F. (1996) Managing service quality in HE: is SERVQUAL the answer? Part 1, *Managing Service Quality: An International Journal*, 6(2), 11-16.

Dabholkar, P. A., Shepherd, C. D. and Thorpe, D. I. (2000) A Comprehensive Framework for Service Quality: An Investigation of Critical Conceptual and Measurement Issues through a Longitudinal Study. *Journal of Retailing* 76(2), 139-73.

Debnath, S. C. (2005) College Student Motivation: An Interdisciplinary Approach to an Integrated Learning Systems Model. *Journal of Behavioral and Applied Management*, 6(3), 168-189. *Five Key Ingredients for Improving... (PDF Download Available)*. Available from https://www.researchgate.net/publication/264840387_Five_Key_Ingredients_for_Improving_Student_Motivation [accessed May 06 2018].

Deshields, O., Kara, A. and Kaynak, E. (2005) Determinants of Business Student Satisfaction and Retention in Higher Education: Applying Herzberg's Two-Factor Theory. *International Journal of Educational Management*, 19(2), 128-139.

Dillon, W., Madden, T. and Firtle, N. (1993) Essentials of marketing research. Homewood, IL:Irwin.

Dimas, G. A., Goula, A. and Pierrakos, G. (2011) Quality issues in higher education: A multicriteria framework of satisfaction measures. *Creative Education*, 2(03), 305.

Douglas, J., Douglas, A. and Barnes, B. (2006) Measuring student satisfaction at a UK university. *Quality Assurance in Education*, 14(3), 251-267.

Douglas, J., McClelland, R. and Davies, J. (2008) The development of a conceptual model of student satisfaction with their experience in higher education. *Quality Assurance in Education,* 16(1), 19-35.

Dutka A. (1995) AMA Handbook of customer satisfaction: A complete guide to research, planning and implementation. NTC Publishing Group, Illinois.

Edosomwan, J.A. (1993) Customer and market-driven quality management. ASQC Quality Press, Milwaukee.

Edvardsson, B. and Witell, L. (2004) Identifying Satisfiers and Dissatisfiers in the Service Encounter. *Asian Journal on Quality*, 6, 8-23.

Elliott, K. M. and Shin, D. (2002) Student Satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management*, 24(2), 197-209.

Eom, S.B., Ashill, N. and Wen, H.J. (2006) The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education*, 4(2), 215-235.

Eskildsen, J. K., Martensen, A., Grønholdt, L. and Kristensen, K. (1999) Benchmarking student satisfaction in higher education based on the ECSI methodology. IN BACCARONI, C. (Ed.) *TQM for Higher Education Institutions II*. Verona, Italy.

Farrell, A. M., Souchon, A. L. and Durden, G. R. (2001) A Conceptualisation of Service Encounters: Employees' Service Behaviours and Customers' Perceptions of Service Quality. *Journal of Marketing Management*, 17 (5/6), 577-594.

Flanagan, J. C. (1954) The critical incident technique. *Psychological Bulletin*, *51*(4), 327-358.

Fornell, C. (1992) A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56, 6-21.

Franceschini, F. and Rossetto, S. (1998) ``QFD: how to improve its use''. Total Quality Management, 9(6), 491-500.

Frazier, A. (1997) A roadmap for quality transformation in education. Boca Raton, Fla.:St. Lucie Press.

Gerson, R. F. (1993) Measuring customer satisfaction. Crisp Publication, Inc., Menlo Park, California.

Ghobadian, A., Speller, S. and Jones, M. (1994) Service Quality: Concepts and Models. *International Journal of Quality & Reliability Management*, 11(9), 43-66.

Gibson, A. (2010) Measuring business student satisfaction: A review and summary of the major predictors. *Journal of Higher Education Policy and Management*, 32(3), 251-259.

Green, D. (Ed.). (1994) What is Quality in Higher Education? London, UK: *Society for Research into Higher Education & Open University Press.*

Grigoroudis E. (1999). Measuring and analysing satisfaction methodology: A multicriteria aggregation-disaggregation approach, Ph.D. Thesis, Technical University of Crete, Department of Production Engineering and Management, Chania (in greek).

Grigoroudis, E., Samaras, A., Matsatsinis, N.F. and Siskos, Y. (1999a) Preference and customer satisfaction analysis: An integrated multicriteria decision aid approach, Proceedings of the 5th Decision Sciences Institutes International Conference on Integrating Technology and Human Decisions: Global Bridges into the 21st Century, Athens, Greece, (2), 1350–1352.

Grigoroudis, E., Malandrakis, J., Politis, J. and Siskos, Y. (1999b). Customer satisfaction measurement: An application to the Greek shipping sector, Proceedings of the 5th Decision Sciences Institutes International Conference on Integrating Technology and Human Decisions: Global Bridges into the 21st Century, Athens, Greece, (2), 1363–1365.

Grigoroudis, E. and Siskos, Y. (2002) Preference disaggregation for measuring and analysing customer satisfaction: The MUSA method. *European Journal of Operational Research*, 143, 148-170.

Grönroos, C. (1982) An Applied Service Marketing Theory. *European Journal of Marketing,* 16, 30-41.

Gruber, T., Fuß, S., Voss, R. and Gläser-Zikuda, M. (2010) Examining student satisfaction with higher education services: Using a new measurement tool. *International Journal of Public Sector Management*, 23(2), 105-123.

Gu, Q., Schweisfurth, M. *and* Day, C. *(2010) Learning and growing in a 'foreign' context: intercultural experiences of international students, Compare: A Journal of Comparative and International Education, 40(1), 7-23.*

Guolla, M. (1999) Assessing the teaching quality to student satisfaction relationship:Applied Customer satisfaction research in the classroom. *Journal of MarketingTheory and Practice*, 7(3), 87-97.

Harvey, L. (2003) Student feedback. *Quality in Higher Education*, 9(1), 3-20.

Harvey, L. and Green, D. (1993) Defining quality, Assessment and Evaluation in Higher Education, 18(1), 9–34.

Harvey, L., Parahoo, S. and Santally, M. (2017) Should Gender Differences be Considered When Assessing Student Satisfaction in the Online Learning Environment for Millennials?. *Higher Education Quarterly*, 71(2), 141-158.

Heck, R.H. and Johnsrud, L.K., (2000) Administrative effectiveness in higher education: improving assessment procedures. *Research in Higher Education*, 41(6), 663–85.

Helgesen, Ø. and Nesset, E. (2007) What accounts for students' loyalty? Some field study evidence. *International Journal of Educational Management*, 21(2), 126-143.

Hendry, G. D. and Dean, S. J. (2002) Accountability, evaluation of teaching and expertise in higher education. *International Journal for Academic Development*, 7, 75-82.

Hennig-Thurau, T., Gwinner, K. P. and Gremler, D. D. (2002) Understanding relationship marketing outcomes: An integration of relational benefits and relationship quality. *Journal of Service Research*, 4(3), 230-247.

Hill, F. M. (1995) Managing service quality in higher education: the role of the student as primary consumer. *Quality Assurance in Education*, 3(3), 10-21.

Hoffman, K. Douglas, Scott W. Kelley and Beth C. Chung (2003) A CIT Investigation of Servicescape Failures and Associated Recovery Strategies. *Journal of Services Marketing*, 17 (4), 322–40.

Howell, G.F. and Buck, J.M. (2012) The Adult Student and Course Satisfaction: What Matters Most? *Innovative Higher Education*, 37, 215-226.

Hutyra, M. (2005). Quality Management System as the Part of University Management. *Paper Presented at Integrating for Excellence*, Sheffield.

Jacquet-LagrËze, E. and Siskos, J. (1982) Assessing a set of additive utility functions for multicriteria decision-making: The UTA method. *European Journal of Operational Research,* 10 (2), 151-164.

James, R., Baldwin, G. and McInnis, C. (1999) Which University? The Factors Influencing Choices of Prospective Undergraduates, Evaluation and Investigations Programme.

Jannecke W. J., Bjorn S. and Jens B. G. (2010) Student Satisfaction: Towards an empirical deconstruction of the concept. *Quality in Higher Education*, 8(2), 183-195.

Johnson, G.D. and Patterson, C. (1993) Percomorph phylogeny: a survey of acanthomorphs and a new proposal. *Bulletin of Marine Science*, 52, 554–626.

Johnston, R. (1995) "The determinants of service quality: satisfiers and dissatisfiers". *International Journal of Service Industry Management*, 6(5), 53-71.

Jones, T. O., and Sasser, W. E. (1995) Why Satisfied Customers Defect. *Harvard Business Review,* 73(6).

Joseph, M., Yakhou, M. and Stone, G. (2005) An educational institution's quest for service quality: customers' perspective. *Quality Assurance in Education*, 13(1), 66-82.

Kang, G. D. and James, J. (2004) Service quality dimensions: An examination of Gronroos's service quality model. *Managing Service Quality*, 14, 266-277.

Keefe, J. W. and Kelley, E. A. (1990) Comprehensive Assessment and School Improvement. *NASSP Bulletin*, 74(530), 54 – 63.

Keeney, R. (1992) Value Focused Thinking: a Path to Creative Decision Making. *Harvard University Press,* Cambridge.

Kember, D. and Ginns, P. (2012) Evaluating teaching and learning *: a practical handbook for colleges, universities and the scholarship of teaching*. London: Routledge.

Kuo, Y., Walker, A., Belland, B. and Schroder, K. (2013) A Predictive Study of Student Satisfaction in Online Education Programs. *International Review of Research in Open and Distance Learning*, 14(1), 16-39.

Lagrosen, S. (2004) Quality management in global firms. *The TQM Magazine*, 16(6), 396-402.

LeBlanc, G. and Nguyen, N. (1997) Searching for excellence in business education: an exploratory study of customer impressions of service quality. *International Journal of Educational Management*, 11(2), 72-79.

Leckey, J. and Neill, N. (2010) Quantifying Quality: The importance of student feedback. *Quality in Higher Education*, 7(1), 19-32.

Letcher, D.W. and Neves, J.S. (2010) Determinant of undergraduate business student satisfaction. *Research in Higher Education Journal*, 1-26.

Llosa, S., Chandon, J.L. and Orsingher, C. (1998) An empirical study of SERVQUAL's dimensionality. Service Indust. J., 18, 16-44.

Long, J. and Freese, J. (2006) Regression Models for Categorical Dependent Variables Using Stata, Second Edition, *A Stata Press publication*, Texas.

Luk, S.T.K. and Layton, R. (2002) Perception Gaps in customer expectations: Managers versus service providers and customers. *The Service Industries Journal*, 22(2), 109-128.

Lupo, T. (2013) A fuzzy ServQual based method for reliable measurements of education quality in Italian higher education area. *Expert Systems with Applications*, 40(17), 7096-7110.

Mai, L. W. (2005) A comparative study between UK and US: The student satisfaction in higher education and its influential factors. *Journal of Marketing Management*, 21(7-8), 859-878.

Mourad, M., Ennew, C. and Kortam, W. (2011) Brand equity in higher education, Marketing Intelligence & Planning, 29(4), 403-420.

Marginson, S. (1998) The West Report as national education policy making. *The Australian Economic Review,* 31 (2), 157–166.

Marsh, H.W. (1982a) SEEQ: A reliable, valid, and useful instrument for collecting students' evaluations of university teaching. *British Journal of Educational Psychology*, 52, 77–95.

Marsh, H.W. (1982b) Validity of students' evaluations of college teaching: A multitrait-multimethod analysis. *Journal of Educational Psychology*, 74, 264–279.

Martensen A., Grønholdt, L., Eskildsen, J. and Kristensen. K. (1999) Measuring student oriented quality in higher education: application of the ECSI methodology//Proceedings from the TQM for Higher Education conference "*Higher Education institutions and the issue of total quality"*, Verona, 371-383.

Martensen, A., Grønholdt, L. and Kristensen, K. (2000). The relationship between customer satisfaction and loyalty: Cross-industry differences. *Total Quality Management & Business Excellence (Print Edition)*, *10*(4), 509-514.

Marzo-Navarro, M., Pedraja-Iglesisias, M. and Rivera-Torres, P. (2005a). A new management element for universities: satisfaction with the offered courses. *International Journal of Education Management*, 19(6), 505 – 526.

Marzo-Navarro, M., Pedraja -Iglesias, M. and Rivera–Torres, P. (2005b), Measuring customer satisfaction in summer courses. *Quality Assurance in Education*, 13(1), 53 – 65.

Mavondo, F., Tsarenko, Y. and Gabbott, M. (2004) International and Local Student Satisfaction: Resources and Capabilities Perspective. *Journal of Marketing for Higher Education*, 14, 41-60.

Mccollough, M. and Gremler, D. (2004) A conceptual model and empirical examination of the effect of service guarantees on post-purchase consumption evaluations. *Managing Service Quality*, 14, 58-74.

McDougall, G. and Levesque, T. (2000) Customer satisfaction with services: putting perceived value into the equation. *Journal of Services Marketing*, 14(5), 392-410.

Mergen, E., Grant, D. and Widrick, S. M. (2000) Quality management applied to higher education. *Total Quality Management*, 11(3), 345-352.

Mihelis, G., Grigoroudis, E., Siskos, Y., Politis, Y. and Malandrakis, Y. (2001) Customer satisfaction measurement in the private bank sector. *European Journal of Operational Research*, 130, 347-360.

Munteanu, C., Ceobanu, C., Bobalca, C. and Anton, O. (2010) An analysis of customer satisfaction in a higher education context. *International Journal of Public Sector Management,* 23(2), 124- 140.

Narasimhan, K. (2001) Improving the climate of teaching sessions: the use of evaluations by students and instructors. *Quality in Higher Education*, 7(3), 179-190.

Naumann E. and Giel K., (1995) Customer Satisfaction Measurement and Management: Using the voice of the customer. *Thomson Executive Press*, Cincinnati.

Nitecki, D.A. and Hernon, P. (2000) Measuring Service Quality at Yale University's Libraries. *Journal of Academic Librarianship*, 26 (4), 259-273.

Oldfield, B. M. and Baron, S. (2000) Student perceptions of service quality in a UK university business and management faculty. *Quality Assurance in Education*, 8(2), 85-95.

Oliver, L. (1999) Whence Consumer Loyalty?. *Journal of Marketing*. 63, 33-44.

Oliver, L. and DeSarbo, S. (1988) Response determinantsin satisfaction judgments. *Journal of Consumer Research*, 14, 495-507.

Palacio, A.B., Menesses, G.D. and Perez, P.J. (2002) The configuration of the university image and its relationship with the satisfaction of students. *Journal of Educational Administration*, 40 (5), 486-505.

Parahoo, S., Harvey, H. and Tamim, R. (2013) Factors influencing student satisfaction in universities in the Gulf region: Does gender of students matter?. *Journal of Marketing for Higher Education*, *23*(2), 135-154.

Parahoo, S., Santally, M., Rajabalee. Y. and Harvey, H. (2015) Designing a predictive model of student satisfaction in online learning. *Journal of Marketing for Higher Education*, 26(1), 1-19.

Parasuraman, A., Berry, L. and Zeithaml, V. (1991a) Perceived service quality as a customer-based performance measure: An empirical examination of organizational

barriers using an extended service quality model. *Human Resource Management*, 30(3), 335-364.

Parasuraman, A., Berry, L. and Zeithaml, V. (1991b) Understanding Customer Expectations of Service. *Sloan Management Review*, 39-48.

Parasuraman, A., Zeithaml, V. and Berry, L. (1994) Alternative scales for measuring service quality: a comparative assessment based on psychometric and diagnostic criteria. *Journal of Retailing*, 70(3), 201–230.

Parasuraman, A., Zeithaml, V. and Berry, L. (1988) SERVQUAL: A multiple- Item Scale for measuring consumer perceptions of service quality. *Journal of retailing*. 64, 12–40.

Parasuraman, A., Zeithaml, V. and Berry, L. (1985) A Conceptual Model of Service Quality and its Implication for Future Research (SERVQUAL). *The Journal of Marketing*. 49, 41-50.

Parker, K., Lenhart, A. and Moore, K. (2011) The digital revolution and higher education: College presidents, public differ on value of online learning. *Pew Research Cencer*: Pew Social and Demographic Trends.

Pasta, D. J. (2009) Learning When to Be Discrete: Continuous vs. Categorical Predictors, ICON Clinical Research, San Francisco, CA, 248. Retrieved from http://support.sas.com/resources/papers/proceedings09/248-2009.pdf. [Accessed on 02/05/2018].

Peter, J. P., Churchill, G. A. and Brown, T. J. (1993) Caution in the Use of Difference Scores in Consumer Research. *Journal of Consumer Research*, 19(4), 655–662.

Ramsden, P. (1991) A Performance Indicator of Teaching Quality in Higher Education: The Course Experience Questionnaire. *Studies in Higher Education*, 16, 129-150.

Reichheld, F. and Sasser, W. E. (1990) Zero Defections: Quality Comes to Services. *Harvard business review*, 68, 105-11.

Rienties, B. (2014) Understanding academics' resistance towards (online) student evaluation. *Assessment & Evaluation in Higher Education* 39(8), 987-1001.

Robinson, S. (1999) Measuring service quality: current thinking and future requirements. *Marketing Intelligence & Planning*, 17(1), 21-32.

Rolfe, H. (2002) Students demands and expectations in an age of reduced financial support: the perspectives of lecturers in four English universities. *Journal of Higher Education Policy and Management*, 24(2), 171-82.

Rossing, J.P., Miller, W.M., Cecil, A.K. and Stamper, S.E. (2012) iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching & Learning*, 12(2), 1-26.

Rowley, J. (2003) "Retention: rhetoric or realistic agendas for the future of higher education". *The International Journal of Educational Management*, 17(6), 248-53.

Rowley, J. (1997) Moving beyond Dyadic Ties: A Network Theory of Stakeholder Influences. *Academy of Management Review*, 22(4), 887-910.

Salmi, J. (2001) Tertiary education in the 21st century: challenges and opportunities. Higher education management.

Schvaneveldt, S. J., Enkawa, T. and Miyakawa, M. (1991) Consumer evaluation perspectives of service quality: evaluation factors and two-way model of quality. *Total Quality Management*, 2(2), 149-162.

Senior, C., Moores, E. and Burgess, A. P. (2017) "I can't get no satisfaction": measuring student satisfaction in the age of a consumerist higher education. *Frontiers in Psychology*, 8, 980.

Shank, G. (1995) Semiotics and Qualitative Research in Education: The Third Crossroad. *The Qualitative Report*, *2*(3), 1-11. Retrieved from https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=2057&context=tqr. [Accessed on 11/04/2018].

Shemwell, D. J., Yavas, U. and Bilgin, Z. (1998) Customer-service provider relationships: An empirical test of a model of service quality, satisfaction and relationship-oriented outcomes. *International Journal of Service Industry Management,* 9(2), 155-168.

Sinclaire, J. K. (2011) Student satisfaction with online learning: Lessons from organizational behavior. *Research in Higher Education Journal 11,* 1-20.

Siskos, Y., and Grigoroudis, E. (2002) Measuring customer satisfaction for various services using multicriteria analysis. In Aiding decisions with multiple criteria, 457-482.

Siskos, Y., Matsatsinis, N. and Baourakis, G. (2001) Multicriteria analysis in agricultural marketing: The case of French olive oil market. *European Journal of Operational Research*, 130, 315-331.

Siskos, J. and Yannacopoulos, D. (1985) UTASTAR: An ordinal regression method for building additive value functions. *InvestigaÁao Operacional*, 5 (1), 39-53.

Smith, G., Morey, A., and Teece, M. (2002). How international students view their Australian experience: A survey of international students who finished a course of study in 1999. Special Report, DETYA, *Australian Education International*, Canberra.

Sohail, M. S. and Shaikh, N. M. (2004) Quest for excellence in business education: a study of student impressions of service quality. *International Journal of Educational Management*, 18(1), 58-65.

Starr, A., Betz, E. L. and Menne, J. (1971) Differences in college student satisfaction: Academic dropouts, nonacademic dropouts and nondropouts. *Journal of Counseling Psychology, 19*(4), 318-322.

Sureshchandar, G., Rajendran, C. and Anantharaman, R. (2002) Determinants of customer-perceived service quality: a confirmatory factor analysis approach. *Journal of Services Marketing*, 16(1), 9-34.

Swan, E. and Trawick, F. (1981) Disconfirmation of Expectations and Satisfaction With a Retail Service. *Journal of Retailing*, 57, 49-67.

Tahar, F.M. (2008) Expectation and perception of postgraduate students for service quality in UTM. Masters thesis, Universiti Teknologi Malaysia.

Tan, K. C. and Kek, S. W. (2004) Service quality in higher education using an enhanced SERVQUAL approach. *Quality in higher education*, 10(1), 17-24.

Teas, R.K. (1993) Expectations, performance evaluation and consumers perception of quality. *Journal of Marketing*, 57, 18-34.

Thomas, E. H. and Galambos, N. (2004) What Satisfies Students?: Mining Student-Opinion Data with Regression and Decision Tree Analysis. *Research In Higher Education*, 45(3), 251- 269.

Venesaar, U., Ling, H. and Voolaid, K. (2011) Evaluation of the entrepreneurship education programme in university: A new approach. *Amfiteatru Economic*, 30, 377–391.

Wakefield, K. L. and Blodgett, J. G. (1996) The effects of the servicescape on customers' behavioral intentions in leisure service settings. *Journal of Services Marketing*, 10(6), 45-61.

Watson, L. (2003) Lifelong Learning in Australia, Canberra, Department of Education, Science and Training.

Watson, L., Wheelahan, L. and Chapman, B. (2002) Fair and Feasible. The scope for a crosssectoral funding model in Australian education and training. *A discussion paper*. NCVER Adelaide.

Webb D. and Jagun, A. (1997) Customer care, customer satisfaction, value, loyalty and complaining behavior: validation in a UK university setting. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 1, 139-151.

Westerbeijden, D. F., Hulpiau, V. and Waeytens, K. (2007) From De-sign and Implementation to Impact of Quality Assurance: An overview of some Studies into what Impacts Improvement. *Tertiary Education and Management*, 13, 295-312.

Wiers-Jenssen, J. and Stensaker, B. (2002) Student Satisfaction: Towards an empirical deconstruction of the concept. *Quality in Higher Education*,8, 183–195.

Williams, J. and Cappuccini – Ansfield G. (2007) Fitness for purpose? National and institutional approaches to 137ublicizing the student voice. *Quality in Higher Education*. 13(2), 159-172.

Winsted, K. (2000) Service behaviors that lead to satisfied customers. *European Journal of Marketing*, 34, 399-417.

Yavas, U., Benkenstein, M. and Stuhldreier, U. (2004) Relationships between service quality and behavioral outcomes: A study of private bank customers in Germany. *International Journal of Bank Marketing*, 22(2), 144-157.

Yorke, M. (1999) Leaving Early: undergraduate non-completion in higher education. London: Falmer.

Zeithaml, V. (1988) Consumer Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, 52, 2-22.

Zeithaml, V., Parasuraman, A. and Berry, L. (1990) Delivering Quality Service- Service – Balancing Customer Perceptions and Expectations. *The Free Press*, New York, N.Y

Zeithaml, V., Parasuraman, A. and Berry, L. (1985) Problems and Strategies in Services Marketing. *Journal o Marketing,* 49, 33-46.

Zeithaml, V., Bitner, M. and Gremler, D. (2008) Services Marketing: Integrating Customer Focus across the Firm, 5th Ed., McGraw-Hill, Boston, MA.

Zerihun, Z., Beishuizen, J. and Van O. (2012) Student learning experience as indicator of teaching quality. Educational Assessment, Evaluation and Accountability.

"FROM BERLIN TO BERGEN" Executive Summary of the General Report of the Bologna Follow-up Group to the Conference of Ministers Responsible for Higher Education, Bergen, 19-20 May 2005 Retrieved from http://www.aic.lv/bolona/Bologna/Bergen_conf/Reports/050503_General_rep.pdf [Accessed on 10/04/2018].