UNIVERSITI PUTRA MALAYSIA

RELATIONSHIP BETWEEN QUALITY FACTORS IN GRADUATE TEACHING AND LEARNING AND STUDENTS' SATISFACTION IN RESEARCH UNIVERSITIES

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By

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DEDICATION

This thesis is dedicated to the memory of mother and father whose encouragement and support have always been there for me; my lovely, patient son, Alisina; my loving family, especially my brothers, Akbar and Asghar, my kind sisters, Manijeh and Mahin, for all the love and support they have given me so generously, and all my friends, particularly Dr. Afsaneh Bagheri, who know just how committed I have been to realizing my dreams.

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February 2014

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Exploring the factors that influence students' satisfaction with teaching and learning has been one of the main focuses of researchers and educators. However, there is limited knowledge on the factors that affect students' satisfaction specifically in research universities. This study aims to explore the factors that influence student's satisfaction in Malaysian research universities.

A questionnaire with 130 items was utilized to measure four dimensions of quality factors (facilities, human-based, system-based and student's skills acquisition) and students' satisfaction (11 items). A total of 305 postgraduate students from three Malaysian universities (UPM, UM, UKM) were asked to respond to the questionnaire on a five-point likert scale ranging from 1(strongly disagree) to 5 (strongly agree).

The findings indicated a significant moderate correlation between quality factors of teaching and learning and students' satisfaction. A multiple regression equation for prediction of quality factors in teaching and learning was utilized in which four dimensions of quality factors (facilities, human-based factors, system-based factors and students' skills acquisition) are treated as independent variables and students' satisfaction as dependent variable. Moreover, the findings indicated that quality factors related to teaching and learning in research universities have a significant relationship with students' satisfaction.

The implications of the findings for improving the quality of teaching and learning in Malaysian research universities as well as graduate students' satisfaction are discussed and recommended. These implications include the influential role of quality factors that affect students' pedagogical improvement. Also, the component of quality factors as proposed and tested by this research including facilities, human-based factors, system-based factors and students' skills satisfaction factors could assist scholars to consider the influence of these factors in shaping students

satisfaction and lead to the development of a theory for students' satisfaction. Furthermore, this study may help educational researchers specifically in Malaysia through evaluating validity and reliability of quality factors of teaching and learning and students' satisfaction scale. Research university educators may specifically use the results of this study in designing more effective research education and training programs. And to be aware of the importance of the factors that affect students' satisfaction improvement and provide them with the specific needs of students in research universities. The findings that supervisors have a significant influence on students' satisfaction improvement will help educators enhance supervisors' awareness of the key role that they can play in shaping students' satisfaction and empower them with the skills to effectively manage their interactions with students.

Other Malaysian university students may become aware of the influential factors in the university that facilitate their satisfaction improvement and more effectively learn research knowledge and skills. This study suggested the significant relationship between age (students between 31 and 40 years old) and human-based factors in research universities. This finding can help educators in providing young students (below 31 years old) with the short courses and workshops on managing their relationships with their supervisors and lecturers in order to improve their satisfaction with these factors. The finding that international students had the lowest satisfaction with these factors should be considered by educators and policy maker if they are to attract more international students to Malaysian universities as suggested by the country's Vision 2020.

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Abstrak tesis dipersembahkan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah.

HUBUNGAN BAGI FAKTOR KUALITI DALAM PEMBELAJARAN DAN PENGAJARAN SISWAZAH DENGAN KEPUASAN PELAJAR DI UNIVERSITI-UNIVERSITI PENYELIDIKAN MALAYSIA

Oleh

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Pengerusi: Prof. Zaidatol Akmaliah Lope Pihie, PhD

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Pengkajian faktor-faktor yang mempengaruhi kepuasan pelajar dalam pembelajaran dan pengajaran telah menjadi salah satu fokus utama bagi para pengkaji dan pendidik. Walau bagaimanapun, terdapat pengetahuan yang terhad ke atas faktor yang memberi kesan kepada kepuasan pelajar khususnya bagi universiti penyelidikan. Kajian ini bertujuon untuk mengkaji faktor yang mempengaruhi kepuasan pelajar dalam universiti penyelidikan Malaysia.

Satu soal-selidik mengandungi 130 item telah digunakan untuk mengukur empat dimensi bagi faktor kualiti (kemudahan, berpandukan kemanusiaan, berpandukan sistem dan perolehan kemahiran pelajar) dan kepuasan pelajar (11 item). Sejumlah 305 mahasiswa daripada tiga universiti Malaysia (UPM, UM , UKM) telah diminta untuk menjawab kaji selidik tersebut berdasarkan kepada 5 skala Likert dengan 1 (sangat tidak bersetuju) sehingga 5 (sangat bersetuju).

Dapatan kajian menunjukkan terdapat korelasi sederhana yang signifikan antara faktor kualiti bagi pengajaran dan pembelajaran kepada kepuasan pelajar. Formula regresi berganda bagi ramalan faktor kualiti dalam pengajaran dan pembelajaran telah digunakan yang mana empat dimensi bagi faktor kualiti (kemudahan, faktor berpandukan kemanusiaan, faktor berpandukan sistem dan pemerolehan kemahiran pelajar) telah diperlakukan sebagai pemboleh ubah bebas dan kepuasan pelajar sebagai pemboleh ubah bersandar. Tambahan lagi, dapatan kajian mendapati yang faktor kualiti berkait dengan pembelajaran dan pengajaran dalam universiti penyelidikan mempunyai hubungan yang signifikan dengan kepuasan pelajar.

Implikasi dapatan kajian dalam menambah baik kualiti pengajaran dan pembelajaran di universiti penyelidikan Malaysia serta kepuasan graduan telah dibincangkan. Implikasi ini termasuklah peranan faktor kualti yang berpengaruh dalam memberi kesan kepada penambahbaikkan pedagogi pelajar.Selain itu, komponen bagi faktor kualti seperti yang dicadangkan dan diuji dalam kajian ini termasuklah kemudahan, faktor berpandukan kemanusiaan, faktor berpandukan sistem dan faktor kepuasan

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kemahiran pelajar dapat membantu pengkaji untuk menilai pengaruh faktor-faktor ini dalam membentuk kepuasan pelajar dan seterusnya menjurus kepada pembangunan teori bagi kepuasan pelajar. Tambahan lagi, kajian ini dapat membantu pengkaji bidang pelajaran terutamanya dalam Malaysia menerusi penilaian faktor kualiti bagi kesahihan dan kebolehpercayaan bagi pembelajaran dan pengajaran serta skala kepuasan pelajar. Pengkaji bagi universiti penyelidikan boleh secara khusus menggunakan dapatan kajian ini bagi merekabentuk program pendidikan dan latihan yang lebih efektif, dan lebih peka kepada kepentingan faktor yang dapat memberi kesan kepada penambahbaikan kepuasan pelajar dan memberikan mereka keperluan yang khusus dalam universiti penyelidikan. Dapatan kajian mengenai penyelia mempunyai pengaruh yang signifikan ke atas penambahbaikan kepuasan pelajar dapat membantu pendidik meningkatkan lagi kepekaan penyelia bagi peranan penting yang mampu mereka mainkan dalam membentuk kepuasan pelajar dan memperkasakan mereka dengan kemahiran bagi menguruskan secara efektif interaksi mereka dengan pelajar.

Pelajar universiti Malaysia yang lain mampu menjadi peka kepada faktor berpengaruh dalam universiti yang memudahkan penambahbaikan kepuasan mereka dan secara efektif belajar ilmu dan kemahiran penyelidikan. Kajian ini mendapati hubungan yang signifikan antara umur (pelajar antara 31 dan 40 tahun) dan faktor berpandukan kemanusiaan dalam universiti penyelidikan. Kajian ini dapat membantu pendidik memberikan pelajar muda (di bawah 31 tahun) mengikuti kursus pendek dan bengkel untuk menguruskan hubungan mereka dengan penyelia dan pensyarah bagi menambahbaik kepuasan mereka terhadap faktor-faktor sebegini. Dapatan bagi pelajar antarabangsa mempunyai kepuasan yang terendah terhadap faktor-faktor ini patut dipertimbangkan oleh pendidik dan penggubal dasar sekiranya mereka mahu menarik lebih ramai pelajar antarabangsa ke university di Malaysia seperti yang dicadangkan oleh Wawasan 2020 negara ini.

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ACKNOWLEDGEMENT

I certify that a Thesis Examination Committee has met on 26 February 2014 to conduct the final examination of Sousan Zhaleh Pour on her thesis entitled "Relationship between Quality Factors in Graduate Teaching and Learning and Students' Satisfaction in Research Universities" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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Declaration by graduate student

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- the thesis has not been submitted previously or concurrently for any other degree at any institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) were adhered to.

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LIST OF ABBREVIATIONS

ACSI	American Customer Satisfaction Index
EFQM	European Foundation for Quality Management
HE	Higher Education
HEI	Higher Education Institution
IRPA	Intensified Research Priority Areas
IT	Information Technology
MHEI	Malaysian Higher Education Institution
MOHE	Ministry of Higher Education
MoU	Memoranda of Understanding
MQA	Malaysian Qualifications Agency
QAA	Quality Assurance Agency
R & D	Research and Development
SERVQUAL	Service Quality
T & L	Teaching and Learning
TQM	Total Quality Management
UKM	Universiti Kebangsaan Malaysia
UM	Universiti Malaya
UPM	Universiti Putra Malaysia
USM	Universiti Sains Malaysia
UTM	Universiti Teknology Malaysia

CHAPTER 1

INTRODUCTION

Background of the Research

Higher Education

Having recently recognized the major role of their curriculum as a service which need to create greater value, Higher Education Institutions are devoting best efforts to meet and even exceed requirements of their students or prospective applicants (DeShield & Oscar, 2005).

Thus, Higher Education Institutions must clearly identify their stakeholders including their existing and prospective students as well as the parents, determine their range of requirements, improve their curriculum to meet and exceed those needs and thereby enhance students' satisfaction (Keegan & Davidson, 2004).

Research universities are considered as postsecondary institutions, which devote their mission and a large portion of their resources to research and development and offer advanced degrees up to doctorate. Research universities need to regularly evaluate and improve their performance in order to reach the world-class standards in terms of innovation, quality, number of research and research outcomes. Research universities are at the apex of the academic system and directly involved in the global knowledge network and require more costs to build and maintaining. It is necessary that their laboratories, libraries and information and technology substructures as facilities sustained to the highest international standards. Research production in key areas has become more important to national development agendas and for the other institutions. Nowadays in order to encourage research, government support to university-based research. Universities that are research oriented hire professors not just based on their ability to teach, but as per their research and the grant money that they can bring in. In fact this is same for almost every college and university, but research universities are better in doing so. Mission of such universities is producing graduate students. Students rely upon their supervisors by conducting meetings with them during office hours and needs help from campus based tutoring services for getting additional assistance. There are other resources also available due to the presence of the research's grant money. In other universities students opt to study using conventional lecture sessions and books for 4 or more number of years.

In today's world, there is a synergy between business, technology, education and research. This fact emphasizes the important role which research universities can play in collaboration with private companies and governmental organizations in developing and seizing business opportunities. The main resources of these institutions are qualified tutors and dedicated students to conduct research and development. Moreover, students increasingly perceive themselves as customers of service partly because of their (students' or parents') engagements which directly affect the education expenses and partially because of the desire to reach the valuable

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outcomes of their spent time and efforts (Evans & Lindsay, 1996; Tricker, Rangecroft, Gilroy, & Long, 1999). When assessing service quality in higher learning institutions such as that of research universities, the perception of students plays an important role in creating greater value.

Malaysian Government and Study of Higher Education

In general, the growth, development and progress of a nation depend on its educational system and its achievements reflected in society. According to Nagalingam and Sivanand (2004), the Malaysian government has always given priority to education. Although the Federal Government in Malaysia has the responsibility for education, the national education system holds within education starting in pre-school up to university. The Ministry of Higher Education (MOHE) has been in charge of the universities (until 2013, when the higher education portfolio was handed to the Ministry of Education). It has been the government's vision to make Malaysia a regional education hub offering tertiary education of the highest level (Anuar, 2006). The Malaysian government has decided to provide standard education for its citizens and has involved in improving the quality and standard of education in order to train qualified manpower for the country (Nagalingam & Sivanand, 2004).

The Government fully supports Higher Education Programs by providing scholarships, low interest loans to students as well as allocating a substantial budget for research and development. In close cooperation with industry, Malaysia has succeeded in raising the standard of higher education in the last 20 years or so. In a bilateral arrangement, the private sector has absorbed a fair share of the Malaysian graduates while the universities have served as a training ground for short-term attachments of staff from industry. The government also emphasizes such practical training as a compulsory procedure. The goal of Malaysian Higher Education is educating and training human resource required for the country as well as building infrastructure for research and development and consulting services (Anuar, 2006), while university-industry joint ventures also from a significant part of the university-industry collaboration program.

According to Mohd. Majid. Konting, Kamaruddin and Man (2009), one of the critical goals of the government of Malaysia towards achieving Malaysia's Vision 2020 is to develop human capital . With the vision 2020 earmarked as the year to achieve fully developed nation status, the crucial need is to train and produce a knowledgeable and skilled workforce in particular and better education population in general (Nuran & Ahmad, 1999). Ministry of Higher Education of Malaysia in 2007 pointed out that human capital development includes a holistic acquisition of knowledge, skills and attitudes, complemented by soft skills and entrepreneurial capabilities.

Malaysian tertiary institutions or Malaysian Higher Education Institution (MHEI) will work towards achieving standards benchmarked according to the international standards and comply with the Quality Assurance Standard Procedure as outlined in the Malaysian Qualification Framework. In the March toward achieving Vision 2020, year 2010 was when there should have been 60% of all academics with PhDs.

There should have also be Memoranda of Understanding signed with various reputable international institutions of higher learning for the purpose of joint research projects. Another critical need is a concerted thrust towards upgrading the quality of research and development, and innovation in all Malaysian universities (Anuar, 2006).

Malaysia is one of the fastest growing economies in the world and it has become an increasingly popular destination of choice for many international students to pursue their postgraduate studies in Malaysia as its public universities offer high-quality education and world class technology and programs in all major fields from the sciences to humanities, all conducted in English. The government wants to take a step further and set the objectives to build a world-class higher education system that both caters for Malaysia's own needs and turns the country into a regional center for educational excellence that attracts student from abroad. The process is already under way; reforms and new initiatives are being introduced and budget is being provided, to strengthen both Malaysia's research capabilities and its "human capital". In the context, Malaysian universities have a key role to play in advancing progress toward becoming a knowledge-based economy. On the importance of providing high quality education for Malaysian students, Mustapa bin Mohamed, former Minister of Higher Education (2006), stated that: "The words frequently used in describing today's economic landscape say it all – borderless economies, service based industries and offshore out-sourcing, to name but a few. Our citizens have to be provided with the best education possible to enhance our competitive position in the world economy" (World Report, Part Two, Malayisa 2008).

The new mission of Malaysia's universities is not just to disseminate and generate knowledge, but also to translate the knowledge into viable products, which can be put into practice locally. Billions of ringgit are being allocated to the commercialization of science and technology, and academics – as one put it – are expected to eat, drink and sleep research (Mustapa, 2008).

There are two major types of universities in Malaysia – public (government) and private - varying according to size, control, focus, selectivity, and the number of degree programs offered. Five major of public universities, such as Universiti Kebangsaan Malaysia (UKM), Universiti Sains Malaysia (USM), Universiti Putra Malaysia (UPM), Universiti Teknology Malaysia (UTM) and University Malaya (UM) have been designated as "research-intensive" universities and singled out for additional funding. They have been tasked with pushing the boundaries of science and producing globally competitive new technological products that add value to the economy (World Report, Part Two, Malayisa 2008; MOHE, 2012).

Research University is a category in higher education to indicate those universities engaged in extensive research activities. A Malaysian Research University must:
Improve the research status; increase and diversify research funding; increase and enhance postgraduate training; increase research support service; promote research activities; improve the commercialization activities of research products ("Malaysian Progress," 2008).

The four research universities mentioned above will receive at least an additional RM100 million each for research, development and commercialization activities

(Ming, 2006). Former-Higher Education Minister Datuk Mustapa Mohamed said that the allocation would also fund the universities' research grants and postgraduate scholarships. It was announced earlier that they had been designated as research universities under the 9th Malaysia Plan. "Based on the recent international ratings of universities, Malaysian universities have not achieved global standards. The target is for the four to be ranked at least in the top 100". The Government hoped to attract more Malaysians to pursue postgraduate studies. "The target in 2010 is for each Research University to have at least 7,500 postgraduate students, mostly pursuing their PhDs," he added (Nc-Su, 2006).

Directing these resources to the four designated research universities is certainly a better use of public funds compared to the purported RM500 million that was supposed to be heading Cambridge's way (Ming, 2006). The government's intention is to facilitate research and development efforts in Malaysia in order to attract domestic Malaysian scientists and researchers from abroad. Malaysia has been industrialized rapidly over the past few decades, however the country can only rely on manufacturing capability once the R & D is developed and expanded with the same speed.

In fact, in the field of research, the emphasis is on function-oriented or interdisciplinary research with the main focus on areas that integrate academic interest and practical relevance. Thus nurturing creativity and innovation can play major role in generating breakthrough ideas for development and improving quality of social life.

In Malaysia most of the RM12 million allocated to R&D in the federal budget will go to these four institutions. The budget also increases royalty payments for successfully commercialized research from 50 – 70 % to 80 % (Mustapa, 2008).
Standards are being raised. One of the most important reforms currently under way in the tertiary education system is the introduction of a unified system of qualifications in order to gain international recognition for Malaysian academic awards.

The Malaysian Qualifications Agency (MQA) has the responsibility for formulating a nationally endorsed benchmark in accordance with best practices worldwide. Public and private educational institutions including colleges, universities and vocational institutions will be audited according to the new standards. The criteria can be also applied to workplace training and lifelong learning. The Minister believes the implementation of internationally accepted standards could turn Malaysia into a centre of educational excellence with foreign students from countries like China, India and Pakistan "flocking" to the country's learning institutions. The goal is to substantially increase the number of international students in the Malaysian system from around 40,000 to 100,000 by the year 2010 (World Report, Part Two, Malayisa 2008; Sadeghi, 2012).

Role of a Research University

Research universities are mission-driven, not-for-profit enterprises. They may host technology-licensing offices, but their primary mission is education and nonprofit research (Wolpert, Ann, 2003).

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One of the roles of a Research University is to play a part in advancing progress toward becoming a knowledge economy. The economic impacts that are derived from the innovative outputs of the university include the attraction of industrial laboratories to the local area, the start-up of new high-tech businesses, and any competitive advantages enjoyed by local businesses when their technology is advanced by university research. Since it is difficult to separate research from education, contributions that research universities make to the local economy through their graduate programs are also considered (Kent, Hill, 2006).

Research universities play a significant role in the value chain of new knowledge creation in science and technology. They also generate local economic impacts through their graduate programs and would like to be able to provide actual access to raw data, particularly in the case of social sciences and sciences, so that a student visiting the site could understand the pedagogical intention of the university member.

A Research University would like to translate knowledge into viable products (Mustapa, 2008). Huge amount of money is being invested in commercializing science; technology and academia. Research University in science and engineering make their way to the market in the form of new products and processes when organizations transform abstract knowledge into concrete technologies. Knowledge will affect enable change within Research University. This knowledge can create new strategies and involves students in all phase of the innovation process. Four of the major universities have been selected as 'research intensive' ones and have been chosen for extra funding for research. University Malaya (UM), University Sains Malaysia (USM), University Kebangsaan Malaysia (UKM) and University Putra Malaysia (UPM) are those four universities. All of these four universities are entrusted with the responsibility for coming up with cutting edge technology and products that can add value to economy.

Research Universities need to customize and tailor make their programs in accordance with requirements of the companies that exist in the market, rather than doing research for its own purpose, because more companies are questioning whether it makes business sense to hire university graduates (McGrath and MacMillan, 2005).

Todays, the world requires people with expertise, common sense who can act as decision makers and leaders. Therefore, Research Universities need to design programs for emerging leaders who can significantly transform the way they think about and address problems (Papadimitriou, 2011). Moreover, establishing consulting services that use the expertise of their academic members will enhance professionalism, contribute to national development and provide financial returns to universities.

Motivation and committed researchers have an affecting role in satisfying Research University's objectives. The researchers are expected to be motivated and passionate and demonstrate high levels of integrity in ethics and values.

Universities need to inform traditional dominance in the generation of new technical and management knowledge. The Internet has made short, on-demand courses for the basics accessible and affordable to everyone, eliminating the need for aspiring managers to devote two years of their lives to full-time study. Therefore, research

universities would like to increase their postgraduate population is through their international student intake.

A Research University should be commercializing by the findings of researches. Also, they must be able to secure funding on a consistent level that will enable them to sustain their research ("Malaysian Progress," 2008).

In sum, research universities play fundamental roles in socio-economic development of the countries. They also create new knowledge and technologies, which have great impacts on different aspects of industrial development. Furthermore, research universities enhance the qualities of graduates who can transfer the acquired knowledge and skills to improve the products and services. Malaysian research universities, though they are still in their infancy stage hold a very promising future in establishing productive institutions in terms of producing new knowledge and expending it later on. However, certain culture and attitude need to be cultivated and this includes research culture. In order to ensure impressive outcome and not just some non-useful invention, research and development (R&D) activities should be developed properly in both Malaysian universities and industries. Moreover, should commercializing universities' research development (Ramli et al, 2013).

Therefore, quality of teaching and learning in higher education can play an influential role in developing the knowledge and skills in students. The following section discusses the programs offered to graduate students.

Graduate Study Program

This study focuses on graduate students, as they can be more of help in this kind of research than undergraduates. Actually undergraduate work is a basic foundation within a given program of study. The course work includes a general cluster of knowledge that promotes a well-rounded education. Thus, the students are exposed to a variety of areas, not just their chosen field of study. These areas would include general education courses: English, Math, History, Laboratory Science, courses in Humanities, and Social Sciences to mention a few. These would be tightly coupled with the students' Major Requirements and Major Elective Requirements. In general, Associate and Bachelor degrees are considered undergraduate course work, while the Master and Doctoral degrees are considered graduate course work. Graduate course work - in most cases - is very specific and particular to one field of study. Thus, the graduate study can be considered as an advanced course work, which follows undergraduate course work.

Academic performance is the outcome of education, the extent to which a student, lecturer or institution has achieved their educational goals. Generally it is measured by examinations or continuous assessment but there is no common agreement on how it is best tested or which aspects are most important, procedural knowledge such as skills or declarative knowledge such as facts. In educational institutions, success is measured by academic performance, or how well a student meets standards set out by local government and the institution itself. Although education is not the only road to success in the working world, much effort is made to identify, evaluate, track and encourage the progress of students in universities.

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In order to develop research universities and leading them to being world-class universities, the academic members must have the best performance. Although research has the most important role in a Research University, the level of student satisfaction can demonstrate the quality of teaching and learning during the term of education which has significant effects on not only graduates' chance to obtain a job but also their success in performing their tasks an roles (Støren & Aamodt, 2010). The level of student satisfaction in this study will be measured through their opinions on facilities; human based; system based and student skills acquisition.

Factors related to teaching in this kind of university as mentioned above to be motivated and satisfy students have to be of high quality. If research universities have proper quality, graduate students' knowledge can affect directly socioeconomic development, which is the MOHE's objective. So, if research universities do not formulate proper plans for effective process of teaching and learning, graduate students may not be satisfied and as a result the government will lose the funds and time.

Quality in Higher Education

Quality enhancement is considered as crucial in the higher educational system and is often linked to students' learning as well as teaching strategies. The main issues to ensure quality of higher education in many countries are the maintenance and improvement levels of teaching, learning, research and scholarship; and improvements in the quality and adaptability of graduates (Harman, 1998).

The idea of "quality of education" has replaced the concept of "effectiveness of education" which was used up to now. Quality of education is differently defined as for instance expression of a significant range of educational effectiveness and reflection of a new approach in which the need for systematic evaluation of undertaken activities is taking essentially to mean including improvement and making endeavors toward accreditation, which aims to confirm that all the standards of educational effectiveness are provided (Maciag, 2005; Wójcicka, 2001).

Dobrzański and Roszak (2007) pointed out that the essential fact in all these considerations is that every university realizing a trend of progress should form quality of education as well as quality of carried scientific researchers. Resulting from this, more and more interest and searching for new solutions and introduction of modern concepts and methods of management are needed.

In higher education the concept of quality has been drawn from industry. Educational institutions are adopting the corporate culture of business organizations including strategic planning, delineation of responsibility and accountability.

The British Standard BS 5700, its international equivalent ISO 9000 and Indian equivalent IS 14000 have attracted the attention of academics. Indian institutions define quality as "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs"(Ishikawa, 1994; Standards, 1988).

In the higher education sector, Baba et al. (2001) discussed the context of Japanese perspective quality control of students and put them into practice. In the higher education context, the Quality Assurance Agency ("QAA," 2003) defined Quality as a way of describing how well the learning opportunities available to students help them to achieve their award. It is about making sure that appropriate and effective teaching; support, assessment and learning opportunities are provided for them (Ahmed, 2008).

According to Wawak, T. et al (2006) universities are dealing with a lot of problems including how and by what means planned activities should be done to receive the best economic effectiveness and not to miss quality of offered education. Quality of education is becoming an element of strategy formation of education in the university and other educational institutions.

There are five broad approaches to quality. They see quality as exceptional, consistency, fitness for purpose, and value for money and transformative (Harvey & Green, 1993). Having considered the five approaches for assessing the quality of higher educational system, each of them is concerned with different aspects of quality: approaches, the optimum quality of educational system a peculiar state of the system which occurs as a result of the chain of defined actions and operations in order to meet a specific social need in a given time and place. Shields (1999) believes that quality has many meanings since each individual has a different perception toward quality. Sallies (1993) points to the dynamism of the idea and the emotional and moral force of quality that does not easily allow it to be limited to as single. Accordingly, one particular meaning of quality is that which best satisfies and exceeds customer needs and expectations. Thus the definition of quality can be more apt if it is defined based on the customer's needs in the context of its application. Juran (2003) believed quality as "fitness for use". Fitness for purpose was built into the Quality Assurance Agency's subject review process in which subject teams were invited to submit self-assessment documents through progress against the team's own stated objectives, which could be assessed (Hart & Rush, 2007).

Good higher education is education which optimally contributes to the improvement of the quality of life and should produce individuals who:
- Are able to work with maximum effectiveness and thereby contribute to the economy.
- Make effective use of, and also generate, knowledge for the 'knowledge society'.
- Develop individuals having the capacity to enhance social and cultural values.

The real indicator of quality is, however, the value added to the product, in this case, the graduating student (Powar, 2005).

Many questions have been raised about quality of education in research universities such as "how to improve quality in higher education?" and "what is the best way for measuring quality in higher education?" This study focuses on research university status as a place for postgraduate education and training.

Quality Factors in Teaching and Learning

The different dimensional factors of quality teaching and learning in universities influence directly the process delivery of instructional design and the course outcomes.

Lammers and Murphy (2002) believed that lecturers' enthusiasm, knowledge ability in the subject, and effective classroom management are highly valued skills which interact with other physical factors such as course design to produce effective teaching and learning.

Jamaliah & Zaidatol (2004) pointed out in their research that quality factors in teaching and learning consist of five measures: lecturer factor, teaching methodology, course relevance, facilities, and support services.

According to Douglas et al. (2006) the concept of the service-product bundle is a valid and reliable tool for the design of a satisfaction survey and segments a University's service offering in such a way as to allow management to target resources. The service- product bundle that they study is based on the bundle that Liverpool John Moores University offered to their students. This bundle consists of three elements:

(1) The Physical or Facilitating Goods: the presentation slides, supplementary handout documents/materials, the lecture theatres, rooms and their level of furnishing, decoration, lighting and layout as well as ancillary services; for example catering and recreational amenities.

(2) The Sensual Service Provided – the Explicit Service; the knowledge levels of staff, staff teaching ability, ease of making appointments with staff, the level of difficulty of the subject content.

(3) The Psychological Service – the Implicit Service; the treatment of students by staff, including friendliness and approachability, concern shown if the student has a problem, respect for feelings and opinions, availability, capability and competence of staff. They also include the ability of the university's environment to make the student feel comfortable.

Mohd Majid Konting et al. (2009) measured three Universiti Putra Malaysia service domains such as teaching and learning experience, administration, and students' facilities. He also assess the achievement of graduates' attribute domain in learning outcomes and soft skills that these items have been identified by the Ministry of Higher Education (2006) namely knowledge; psychomotor, technical and practical skills; lifelong learning and information management; communication skills; thinking and scientific skills approach; management skills and entrepreneurship; social skills and sense of responsibility; and professionalism, values, attitudes and ethics. After the factor analysis results of the original three UPM service domains fitted the items into four new categories of students' satisfaction level: human-based, system-based, experience (work related) and facilities.

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Hills (1995) and Wallace (1999) support the fact that student's perception is important, and that students are the primary customers in any learning institutions. A Higher Education Institutes, being a college or university ought to continuously improve their services based on the stakeholders' value. To improve teaching and learning as well as facilities and services being offered stakeholders' perception of the Higher Education Institutes is essential (Mohd. Majid Konting et al., 2009).

Drawing upon previous researches on quality in higher education of research universities in Malaysia, this study aims to measure the quality of teaching and learning in research universities and its impacts of graduate students' satisfaction. Specifically, it concentrates on four categories of quality in higher education which are a) facilities including library, academic area and website, b) human based including supervision, c) system based including course, information provision, and d) graduate student achievement including skill acquisition.

Student Satisfaction

Satisfaction is a customer's fulfillment response with a product or service that is influenced significantly by the customers' evaluation of product or service features (Brady M.K. & Robertson, 2001; Lovelock, Patterson, & Walker, 2001; Oliver, 1997). However, in many satisfaction studies, most organizations determine important features and attribute for their service and then measure perception of those features as well as overall service satisfaction (Zeithmal & Bitner, 2000). One of the most important goals of universities is student satisfaction. Positive word of mouth (WOM) communication, student retention and loyalty are outcomes of a satisfied student as a source of competitive advantage (Arambewela, R. & Hall, 2009).

Several studies have shown that a high level of customer service quality can exert a positive influence on customer satisfaction (Choi, Cho, Lee, Lee, & Kim, 2004; Cronin & Taylor, 1992; Ramsaran-Fowdar, 2006; Zeithmal, Berry, & Parasuraman, 1996). The relationship between service quality and customer satisfaction has been discussed during the past decade. According to Jun et al. (2004), some authors e.g., (Gronroos, 1983) argued that there is a significant overlap between these two concepts, and thus, they can be used interchangeably. Other researchers e.g. (Bitner, Booms, & Tetreault, 1990; Carman, 1990; DeRuyter, Bloemer, & Peters, 1997; Lee & Yoo, 2000) though, have attempted to differentiate between these two constructs. They argued that service quality is an overall evaluation of the service under consideration, whereas customer satisfaction is often viewed as the result of specific service transactions (Chang, Lin, Tsou, & Chen, 2008).

Statement of the Problem

To become a developed nation by the year 2020, Malaysia needs to create well educated and highly skilled human capital (Mohd Majid Konting, et al., 2009; Ho-Abdullah & Yahaya, 2007; Kaur, Sirat, & Azman, 2008; Ministry of Higher Eduction, 2007; Sato, 2005). Action is being taken to upgrade the quality of Malaysian universities to achieve world-class status. The Research Universities play

important roles to achieve the vision. To do so, they need to improve postgraduate students' teaching and learning methods and training programs. Whereas, dissatisfied students as customers contribute directly to the cost and the strategy of Research Universities of Malaysia to reach world-class standards, a gap shall be identified in this regard ("Malaysian Progress," 2008).

Currently, there is much emphasis on research in a Research University. Research University lecturers must only teach three in-class hours during a week, in contrast to a local university where a lecturer has to teach up to twenty in-class hours a week and do much of their own marking. This leaves more free time for Research University lectures to do more research. Therefore, to have a better comprehension of the evidence effect between quality factors of teaching and learning of graduate and students' satisfaction, further research is needed to be undertaken. Regarding the quality of teaching and learning in Research Universities, which need to be more research-based, there is limited knowledge on quality factors of teaching and learning in Research University. Nonetheless, whilst undergraduates have received substantial academic exposure, postgraduate-based research on this impact of teaching and learning quality and postgraduate's satisfaction has been scant (Angell, Heffernan, & Megicks, 2008).

Currently, universities across the world are competing for students both nationally and internationally and lack of quality of teaching and learning in the universities will affect the number of students willing to enter universities. Based on the findings of Petruzzellis et al. (2006), universities need to focus on improving quality (Odhiambo, 2011) teaching and non-teaching services, in order to quickly respond to the target, and foster a stronger relationship with surrounding economic and productive systems. Universities are expected to cope with the challenges of cultural diversity, varied learning styles, the changing demands of students (Arambewela, A. & Hall, 2009). In order to recruit and retain students, universities should aim to enhance students' satisfaction and improve factors, which might lead to their dissatisfaction. This can only be achieved if all the services that contribute to "academic life" are delivered to a suitable standard. The students are the sole judges of whether or not this has been achieved. Therefore, student satisfaction surveys should be undertaken on a regular basis and a university's service offering should be adapted and improved accordingly (Douglas et al., 2006). According to Arambewela and Hall (2009) universities need to recognize the fact that postgraduate students are expected to evaluate an educational service differently resulting in the formation of different attitudes toward service performance. Students' satisfaction of teaching and learning in a Research University affects the acquisition of the knowledge and skills as well as the quality of applying the skills in organizations where these graduates may work in the future. Regarding the increasing amounts of funds allocated to Research Universities (Mustapa, 2008), it will be beneficial to the government of Malaysia to spend the fund more purposefully to improve quality of teaching and learning in universities.

Whilst recent research suggests that postgraduate students are notably different from undergraduates (Taylor, 2002), their future contribution to revenue streams justifies the value in studying them in their own right. Thus, in light of recent changes and ongoing development of the postgraduate sector in universities all over the world, it is important to get a deeper understanding of the nature of the service that they

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provide. Angell et al. (2008) identified the need for more focus on postgraduate students who are provided with a larger variety of courses to see if a consistent selection of service attributes/factors becomes evident.

Research Objectives

The objectives of this research are as follow:

1. To determine students' perception of quality factors on teaching and learning in Malaysian research universities.
2. To determine graduate students perceived quality factors based on their demographic characteristics in Malaysian research universities.
3. To determine the level of graduate students' satisfaction in teaching and learning in Malaysian research universities.
4. To determine graduate students overall satisfaction based on their demographic characteristics in Malaysian research universities.
5. To determine the relationship between quality factors and student satisfaction in Malaysian research universities.
6. To determine the predictors of graduate students satisfaction in Malaysian research universities.

Research Questions

In order to achieve the purpose of the study, the following questions are proposed:

1. What are the students' perception of quality factors (facilities, human-based, system-based, graduate students achievement) in teaching and learning in Malaysian research universities?
2. What are the levels of graduate students' satisfaction in teaching and learning in Malaysian research universities?
3. Are there any significant relationships between quality factors in teaching and learning and students' satisfaction in research universities?
4. Are there any significant differences between the graduate students overall satisfaction level based on their demographic characteristics (Gender, Ethnicity, Age, level of education, mode of study) in research universities?
5. Are there any significant differences between the graduate students perceived quality factors based on their demographic characteristics (Gender, Ethnic, Age, level of education, mode of study) in research universities?
6. What are the predictors of graduate students' satisfaction in teaching and learning?

Significance of the Study

The findings of this study are important for practitioners in the higher education sector. The Malaysian Ministry of Higher Education (now through the Ministry of Education) can benefit from the results of the current study to make new policies and review existing standards. The development process for more economic prosperity

will be affected by the information and facts too. The Malaysian economy's capacity can be affected by effectiveness of education, teaching and retraining. To preserve the competitiveness in the future, the levels and skills of employees will have a deep effect too. High education standards and research are also fundamental needs to achieve economic development. The growth and development of Research Universities in Malaysia is due to this fact too. It is necessary to state that the quality of education delivered can be measured by relations between industry, number and level of researches and perception of students as the customers. In addition, Government and Funding Bodies will use the results by making association tables of Research University performance, which has a strong impact on the retention of current students and attraction of potential students.

Secondly, authorities should pay attention to the academic facilities of the Research Universities if they are to improve the quality of services for higher education. Students expect research universities to have modern equipment and appealing materials associated with the service such as brochures, booklets, etc. Authorities should take into account the inanimate service environment so as to enhance perceived service quality and achieve student satisfaction.

The findings of this study can help the Research University educators to identify strengths and weaknesses in each area of teaching and learning quality and explore opportunities for enhancing their educational standards through developing more effective strategies (Mohd Majid Konting, et al., 2009).

 Thirdly, authorities should ensure that employees are well trained and understand the level of service that the university expects to provide for its students. Graduate staff should be able to show adequate personal attention to students. Ensuring that employees are well trained, and paying attention to other factors that are required for the provision of a high level of service quality might incur increased costs, but will provide improved student satisfaction.

Moreover, the finding of this study can help graduate applicant to recognize the proper university with comparing the quality factors of teaching and learning of each one in the special field of study that they want to continue their study. Beside the graduate student can improve their ability and research skills with the programs that Research University provided in research area. Graduate students (master's degree) in some cases; want to continue toward the doctorate degree, but often it depends on their level of satisfaction of the quality of university that they applied. Also, because of substantial difference among universities, departments, and individuals, humanities and social science doctorates on average take somewhat longer to complete than natural science doctorates, this study might help applicant to choose the best one due to the differing nature of research between the humanities and some social sciences and the natural sciences and to the differing expectations of the discipline. Some students may also choose to remain in a program if they fail to win an academic position, particularly in disciplines with a tight job market; by remaining a student, they can retain access to libraries and university facilities, while also retaining an academic affiliation, which can be essential for conferences and job-searches. Competition for jobs within these fields also raises expectations on the quality of universities considerably.

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Thus, authorities are expected to allocate more financial resources for the human resource applications, revealing that recruiting and selecting the most suitable candidates for the vacant posts and training staff permanently will result in qualified personnel being able to provide students with caring, individualized attention and convenient operating hours. The allocation of financial resources for the human resource applications will equip employees with a better understanding of service excellence.

Therefore, the findings of this research may help Malaysian research universities to improve the quality of academic teaching and learning programs in order to realize their mission.

Limitations of the study

Although this research provides better knowledge on the quality factors that improve students' satisfaction with teaching and learning in research universities, there are some limitations that should be acknowledged.

1. The limitation imposed by the researcher has been the fact that this research was restricted to only research universities because of the importance of students' satisfaction in these universities. Therefore, the findings cannot be generalized to other universities.
2. Secondly, in this study we only focus on Malaysia and three universities, which are located in the Klang Valley in the state of Selangor in central Peninsular Malaysia. It may be argued, however, that the three universities selected for the study are research universities in Malaysia, with a high percentage of postgraduate students in their student population. Issues identified in the study could, therefore, be considered to have a common appeal to postgraduate students in this country in any other research universities.
3. The third limitation is that the data collection surveys, cover only perceptions of the performance of the university services. Ideally, the student expectations should have been captured before students arrived at their study destination. While an effort was made to gather data from newly arrived students who had lived in Malaysia less than six months, the methodology may be subject to criticism for ''contamination'' of student perceptions in relation to their experience with the services.
4. Finally, our sample included only Master and PhD students, because a large number of students are in undergraduate level.
5. No direction of relationship between variables when researcher conducts correlation in this study.

Definitions of Key Terms

Graduate Student

Graduate students are those that are building an academic career path after their Higher National Degree or Bachelor Degree (Oredein, 2007). For the purpose of this study, the students are referred as graduate students (Master or PhD students).

Quality in higher education

For the purpose of this study quality in higher education is a way of describing how well the learning opportunities available to students help them to achieve their academic objectives. It is about making sure that appropriate and effective teaching; support, assessment and learning opportunities are provided for them (Ahmed, 2008).

Quality Factors in Higher Education

For the purpose of this study quality factors are defined as services that help students to achieve their objectives in four terms developed by previous researches, including:
1. Facilities such as library, academic area and website;
2. Human-based factors including supervision, lecturer;
3. System-based factors including course, information provision;
4. Student's skill acquisition factors including research skills and awareness, ethics and social understanding, communication skills, personal effectiveness/development, team working and leadership, entrepreneurship and innovation and skill development.

Students' satisfaction

Lovelock, Patterson and Walker (2006) conceptualize customer satisfaction as an individual's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations. In this study student's satisfaction refers to the extent that students are satisfied with teaching and learning services provided by research universities.

Malaysian research universities

In this study Malaysia research universities refer to three Malaysian universities: Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and University Malaya (UM), which are located in the Klang Valley and have been selected by the Ministry of Higher Education as leading research universities. The two other research universities which are Universiti Sains Malaysia (USM) and Universti Teknologi Malaysia (UTM) are not included because they are not in the Klang Valley but in Penang to the northwest and Johor Bahru the south of the Malay Peninsula.

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