



ANALYSIS OF QUALITY EDUCATION FOR
POLYTECHNIC GRADUATE: A SURVEY IN
MALAYSIA

BY

FARIDAH BINTI SUBOH

A dissertation submitted in partial fulfilment of the
requirements for the degree of Master of Science
(Manufacturing Engineering)

Kulliyyah of Engineering
International Islamic University Malaysia

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ABSTRACT

The purpose of this study is to identify the application of quality knowledge in industries. Second purpose is to evaluate the need on quality knowledge for polytechnic graduate and the industry and thirdly, to evaluate the needs of soft skills knowledge for polytechnic graduate. The scope of study limited to the polytechnic graduate from the Mechanical and Electrical Department. One hundred (100) set of questionnaires were distributed to the Mechanical and Electrical Department graduates. However, only 70 questionnaires were returned (70% response rate). The reliability value (alpha cronbach) of the instrument was 0.833. Data collected were analyzed using Statistical Package for the Social Science software (SPSS/PC+) version 15 to find the mean and frequency by using descriptive statistics. Pearson correlation, t-test and ANOVA are used to analyze the inferential statistics. The descriptive results shows that the need of quality knowledge in workplace is high (mean = 4.12). While the need of soft skill shows that mean 4.15 were also high and the mean of quality assurance is 4.16. The results of the hypothesis shows that there is no significant differences between quality assurance, quality knowledge need, and soft skill knowledge need with existing position by using ANOVA ($p>0.05$). The result also shows that there is no significant relationship between quality assurance, quality knowledge need, and soft skill knowledge need with students CGPA ($p>0.05$). As for the t-test quality assurance, quality knowledge need, and soft skill knowledge need with student qualification, it shows that there is no significant differences.

ملخص البحث

إن الغاية من هذه الدراسة هي لتعريف التطبيقات لنوعية المعرفة في الصناعة. والغاية الثانية هي لتقييم الحاجة لنوعية المعرفة لخريجي المدارس التقنية والصناعة وثالثاً، لتقييم الحاجة الى المعرفة بالمهارات التقنية لخريجي التقنية المتعددة ركزت هذه الدراسة على خريجي اقسام الكهرباء والميكانيك تحديداً. تم تحضير 100 إستفتاء والذي تم توزيعه على خريجي الكهرباء والميكانيك. ولكن، تم إرجاع 70 إستفتاء فقط (معدل الاستجابة 70%). وموثوقية القيمة للجهاز كانت (0.833) والمسماة (الفا كرون باج). تم تحليل المعلومات التي تم جمعها باستخدام سوفت وير الخاص بالاحصاء للعلوم الاجتماعية (أس بي أس أس/بي سي +) النسخة رقم 15 لايجاد المعدل ومدى تردد القيمة باستخدام الاحصاء الوصفي. تم استخدام المقارنة بالافراد، فحص- تي وكذلك الانوفا لتحليل الاحصاء الاستدلالي. توضح النتائج الموصوفة الحاجة الى إن نوعية المعرفة في مكان العمل ذو قيمة عالية (المعدل = 4.12). بينما الحاجة الى المهارات التقنية أعطت معدل 4.15 وكذلك قيمة عالية بالنسبة الى جودة النوعية البالغة 4.16. اوضحت نتائج الفرضيات بانه لا يوجد فرق واضح ما بين جودة النوعية، الحاجة الى نوعية المعرفة، والمعرفة بالمهارات التقنية باستخدام الانوفا (قيمة بي أكبر من 0.05). كما اوضحت النتائج بانه لا توجد علاقة بين جودة النوعية، والحاجة الى نوعية المعرفة، والمعرفة بالمهارات التقنية بالنسبة للطلاب الذين لديهم نتائج سي جي بي أي (قيمة بي أكبر من 0.05). بالنسبة الى فحص-تي لجودة النوعية، الحاجة الى نوعية المعرفة، والمعرفة بالمهارات التقنية بالنسبة الى مؤهلات الطلبة اوضحت عدم وجود فرق واضح.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Science (Manufacturing Engineering).

.....
A.K.M. Mohiuddin
Supervisor

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Science (Manufacturing Engineering).

.....
A.N. Mustafizul Karim
Internal Examiner

.....
Mohd. Radzi Haji Che Daud
Internal Examiner

This dissertation was submitted to the Advanced Engineering and Innovation Centre and is accepted as a partial fulfilment of the requirements for the degree of Master of Science (Manufacturing Engineering).

.....
Agus Geter E. Sutjipto
Director, Advanced Engineering
And Innovation Centre

This dissertation was submitted to the Kulliyah of Engineering and is accepted as a partial fulfilment of the requirements for the degree of Master of Science (Manufacturing Engineering).

.....
Amir Akramin Shafie
Dean, Kulliyah of Engineering

DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Faridah binti Suboh

Signature:.....

Date:

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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**ANALYSIS OF QUALITY EDUCATION FOR POLYTECHNIQUE
GRADUATES: A STUDY IN MALAYSIA**

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To my mother
and my children for continuous support
and understanding

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LIST OF ABBREVIATIONS

HEI	Higher Educational Institution
MOE	Ministry of Education
TQM	Total Quality Management
ISO	International Organization for Standardization
SPSS	Statistical Package for the Social Science

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The polytechnic institution under the Department of Polytechnic Education, Ministry of Higher Education is one of the important elements in producing skilled manpower to the nation. The development of the skilled manpower is extremely needed and it is parallel to the industries demand. The common technical courses offered are such as mechanical engineering, electrical engineering and civil engineering. The duration of the course to be completed for the diploma student is six semesters or three years and for the certificate student is four semesters or two years. Malaysia has twenty seven polytechnics (up to 2009) all over Malaysia (*Refer Appendix A*).

Quality assurance in higher education delivery has become a focus of attention as universities have privatized and the Internet has globalised the educational market place. Numerous measures by which to judge quality of educational delivery are being developed, with a particular focus on objectives measured central administration, and statistical comparison. What is receiving less attention, and stands to be eclipsed as a means of measuring quality, are traditional quality assurance measures, administered by academics at the micro (delivery) level both as ongoing continuous improvement in response to verbal feedback from students, and in response to periodic, often richly qualitative, feedback from students on completion of a particular course of study.

The current so-called ‘knowledge era’ has reintroduced knowledge as the fundamental major contributor of business success in an era that, it is claimed, is ‘the ultimate step in the transformation of knowledge’ (Allee, 1997, p. 6). Indeed, Castells

(1996) claims that knowledge is the source of all productivity. Allee argues that the extent of change is demonstrated by the fundamental shift in scientific thinking from Newtonian to quantum physics, in which time is viewed as polychronic rather than monochronic, growth is recognized as organic and chaotic rather than linear and managed, and understanding requires 'whole' thinking rather than being dissected into parts. At the micro level, organizational structures are changing from static to emerging forms as knowledge becomes infinite and unbounded. To support these changes, management needs to become insightful and participative rather than controlled and predictable. Workers need to be encouraged to constantly learn in order to adapt to multi-faceted roles rather than specialized and segmented tasks. This need for whole systems thinking appears to accord with the total quality concepts enunciated by Deming (1982).

The degree of change required in business places universities, traditionally at the centre of knowledge development, under enormous pressures not only to improve the quality of their graduating students, but to demonstrate such improvement in measurable ways. Not only are universities required to graduate students with demonstrable capabilities to turn simple data into information and knowledge and to share this knowledge as a source of innovation for the future, but they are also required to demonstrate quality through positive student feedback on their educational experience.

Nowhere are these pressures more clearly obvious than in management education. Management educators have long been exhorted to design quality educational experiences to assist students to handle complexity in the workplace (Alvesson & Willmott, 1992). For some years it has been recognized that management education cannot afford a narrow vocational focus, but rather needs to graduate

student-as-managers who understand the social, moral, political, and ideological ingredients of managerial work (Reed & Anthony, 1992, p. 601). This creates many dilemmas for academics when developing appropriate measures of student feedback as much of the educational process requires students to reflect on their own experience as managers and leaders. If not carefully handled, negative feedback can be received not because the educational process is deficient but because the students are made uncomfortable by having to assess their values.

In this circumstance, developing student feedback surveys that focus on quantitative measures, and are administered at a distance by a central organization within the university, have the potential to give an inaccurate picture of the quality of the educational process. Furthermore, there is often rich qualitative feedback (both formal and informal) collected at the decentralized educational delivery point that it is not easy to summarise for use at a central level. For example, there is ongoing student verbal and written feedback about how they have used techniques discussed in their practice and why they have chosen certain subjects based on positive word-of-mouth experience of past students. Without this rich depth of feedback, centrally administered quantitative surveys often distort student feedback. What is then required is a means to link the two levels and forms of student feedback as part of a holistic quality assessment.

What counts as quality is contested' (Barnett, 1994, p. 68). Quality may mean different things to different people who therefore demand different quality outcomes and methods of assessing quality. Harvey and Green (1993) describe quality as a 'relative concept'. It is relative to the stakeholders in higher education.

Quality is relative to the user of the term and the circumstances in which it is involved. It means different things to different people, indeed the same person may

adopt different conceptualisations at different moments. This raises the issue of whose quality? (Harvey & Green, 1993, p. 10). There are a variety of stakeholders in higher education, including students, employers, teaching and non-teaching staff, government and its funding agencies, accreditors, validators, auditors, and assessors (including professional bodies) (Burrows & Harvey, 1992).

Each of these stakeholders has a different view on quality, influenced by his or her own interest in higher education. For example, to the committed scholar the quality of higher education is its ability to produce a steady flow of people with high intelligence and commitment to learning that will continue the process of transmission and advancement of knowledge. To the government a high quality system is one that produces trained scientists, engineers, architects, doctors and so on in numbers judged to be required by society. To an industrialist a high quality educational institution may be one that turns out graduates with wide-ranging, flexible minds, readily able to acquire skills, and adapt to new methods and needs (Reynolds, 1990).

Each of these views represents a valid expectation of higher education and about its quality. The measurements thus required and the standards to be applied will surely be different for each of these notions of quality. This idea is resonant with what Barnett (1994) conceives as a threefold connection between different conceptions of higher education, different approaches to quality, and the identification of different outcome measures (which Barnett terms as performance indicators, or PIs). Behind the various notions of what constitutes quality, there lies, whether explicitly formed or held tacitly, a view as to the ends that higher education should serve. In turn, these prior conceptions will generate different methodologies for evaluating quality, and in particular will call for alternative sets of outcome measure (PIs).

Barnett (1994) illustrates this interconnectedness between conceptions, approaches and outcomes in the context of four dominant contemporary conceptions of higher education.

When higher education is conceived as the production of highly qualified manpower, the graduates are seen as products whose career earnings and employment will relate to the quality of the education that they have received. When higher education is likened to a training for a research career, the PIs then become the research output of staff and students and the input measures of their research ability. The third conception is higher education as the efficient management of teaching provision. On this view, the PIs are efficiency indicators, such as completion rates, unit costs, student-staff ratio, and other financial data. Further, when higher education is conceived as a matter of extending life chances, the focus is on the participation rate or percentage growth of students from under-represented backgrounds, including mature students, part-time students and disabled students. These are four different, if overlapping, conceptions of the purposes of higher education.

Each of them has its own definition of quality and with a distinctive set of PIs that are associated with it. Common in these four conceptions is the view of higher education as a 'black box'. None of them focuses on or indicates an interest in the educational process, or the quality of the learning achieved by the student. They ignore what goes on in the 'black box' and focus on the inputs and outputs.

Barnett (1994) later contrasts these four conceptions with another four conceptions of higher education which focus, this time, on the quality of the student experience. The first conception is about exposing students, or initiating them into the process and experience of pursuing knowledge. The second is related to the development of students' autonomy and integrity. The third values the cultivation of

general intellectual abilities of students to form perspectives and vision beyond the confines of a single discipline. The final conception of higher education is about the development of critical reason. Those four conceptions, unlike the previous four, do not easily lend themselves to evaluation by numerical quality measures, such as PIs. The complexity and quality of the educational process and student experience will not be readily captured by any form of objective measures using numbers and scores. Hence, the usefulness of performance indicators by focusing primarily on input and output is very much in doubt.

The quality of the higher education institutions and their core activities has long been the subject of discussion and scrutiny. Because of the importance of external quality assurance (EQA) and its consequences, the quality of EQA agencies has also become a subject of discussion. At the fifth INQAAHE conference in Chile, the concept of a quality label for EQA agencies was raised (Vroeijenstijn, 1999). Members' reactions ranged all the way from strong support to strong opposition.

A useful analogy may be drawn from the context of ISO 9000. Organisations seek ISO 9001 certification, and companies exist to grant such certification. How can an organization know that such a company is competent to provide the certification? The answer is that such companies are themselves certified by another body. There exist a number of such bodies world-wide, usually governmental or quasi-governmental. This provenance gives them their authority, and there is no higher level of approval body.

In our field, higher education institutions are analogous to the organisations seeking certification, and EQA agencies are analogous to the companies granting this certification. Of course, with higher education institutions, the state often exerts some control (through funding, regulations, etc.), but nonetheless, EQA agencies should still

be ‘adding value’ to the process. We therefore come to the analogous question: *how can an institution know that such an agency is competent to fulfill the external QA role?* Agencies have generally not felt the necessity to assess their own functioning, principally because so many of them are mandated by a government, which also requires the institutions to be subject to their QA checks. Nonetheless, it is the responsibility of all agencies to ask themselves the question: *how good are we at the job we are supposed to be doing?* The importance of this question is such that it has recently been raised in several contexts, with a suggestion of setting up a body to verify the competence of EQA agencies. This paper does not suggest taking that step, but proposes that INQAAHE should state a set of ‘Principles of Good Practice’ for EQA agencies to assist member (and other) agencies to answer the question ‘*how good are we?*’ and to give them guidance on how to proceed in order to improve. It is worth observing that most professions (for example, medicine, law, accountancy) have a self-regulating framework for quality assurance of their services. As a developing profession (Woodhouse, 2002), EQA should reflect on what it should be doing in this respect: INQAAHE is the body through which such reflection can occur.

1.1.1 Research Background

In similar vein, Harvey and Green (1993) conceive quality as a multifaceted notion which is value-laden in nature. Each stakeholder in higher education sees quality and its outcomes differently resulting in a host of methods and approaches adopted to measure quality in the light that one sees it. There are widely differing conceptualizations of quality in use (Schuller, 1991). But Harvey and Green in their discussion of the relationship between quality and standards in higher education identify perceptions or notions of quality discernible in higher education: quality as

exceptional (linked with excellence and elitism), as *perfection* or consistency, as *value for money*, and as *transformative* (interpreted as 'the enhancement and empowerment of students or the development of new knowledge') (Harvey, 1995; see also Harvey *et al.*, 1992). Each of these notions of quality has implications for the methods and approaches used to measure the desirable outcomes emanate from it.

There are problems raised by this pluralistic view of quality and its measurement: Who should define the purposes of higher education? Should it be the government, the students, the employers of students, the managers of institutions or the academic professionals?

Barnett (1994) describes the quality debate by different groups of actors in higher education as a 'power struggle', where each group tries to fight for their voices to be heard and taken into account when assessments of quality are undertaken. Each of the different voices is valid deserving serious exploration in its own right, but none can be the only legitimate voice to be heard. It is therefore the challenge for any kind of performance evaluation to be framed so as to permit the equal expression of legitimate voices, though they may always conflict or compete in some ways.

As a result of the diversity in views about quality and higher education, a variety of systems and approaches have been developed for monitoring quality of different kinds and at different levels, displaying varied emphases and priorities. These monitoring systems include the following.

Quality control is a system to check whether the products produced or services provided have reached the pre-defined standards. Quality is usually inspected at the end of the production and is undertaken by someone external to the workforce. The main problem with this approach to quality measurement in higher education is that it

is done in isolation ignoring the fact that the overall quality of a university must be the concern of everyone who works there (Frazer, 1992).

Quality assurance is a system based on the premise that everyone in an organisation has a responsibility for maintaining and enhancing the quality of the product or service. When put in the university context, quality assurance requires a whole-institution approach for a complete transformation to quality involving top-level commitment, followed by substantial and comprehensive re-education of all personnel (Chaffee & Sherr, 1992). The transformation requires time, effort, and willingness of everyone in the institution to change to a culture which is quality-driven and ever-improving.

When compared to the quality control system, quality assurance represents a more comprehensive approach to assessing and monitoring quality in higher education. Quality assurance requires not just the detection of defects as in quality control but also their prevention. It requires the commitment of everyone in the institution to an organizational culture that prizes quality, relentlessly improving in search of perfection. However, this is something very difficult to achieve which very often remains as a goal or philosophy that universities would aspire to seek to achieve or get closer to. Quality audit is a means of checking that relevant systems and structures within an institution support its key teaching mission, and to ensure that provision is at or beyond a satisfactory level of quality. A quality audit can be conducted either internally or externally. Audit checks that the university system does what it says it is going to do, and has written documented evidence to prove it. The major criticism of audits is that they offer no more than a snapshot of an institution (Pearce, 1995). Educationists generally find audit distasteful shallow, undemanding

since either the evidence of conformance to processes and procedures is there or it is not. There is no argument about it (Green, 1994).

Quality assessment is a means of assessing the quality of what is actually provided by institutions (Pearce, 1995). Green (1994) adds that quality assessment involves the judgement of performance against criteria, either internally or externally. This gives rise to a potential source of conflict, precisely because quality criteria for education are so difficult to agree (Keefe, 1992). Another potential problem with quality assessment is that it is usually intended to be mission sensitive (Pearce, 1995). It examines the quality of education provision against the expressed aspirations of the individual institution. If the institution has high aspirations, quality is to be measured against this yardstick. That might make it more difficult for a university to succeed than another which set itself lower aspirations.

Taken to absurdity, a university which aspired to produce rubbish, and succeeded, would be of higher quality than a university which claimed intellectual excellence, but narrowly failed (Pearce, 1995). *Indicator systems* approach to evaluating universities compares performance across a range of indicators (Johnes & Taylor, 1990). There are several characteristics associated with performance indicators. First, a performance indicator should have a monitoring function. It can be defined as 'an item of information collected at regular intervals to track the performance of a system' (Fitz-Gibbon, 1990). Second, an indicator is usually quantitative (Cuenin, 1986). Third, performance indicators are objective-related; they are 'statements, usually quantified, on resources employed and achievements secured in areas relevant to the particular objectives of the enterprise' (CVCP/UGC, 1986). The development of PIs in higher education can be traced back to manufacturing industry and relates to the way in which inputs are transformed into outputs (Johnes &