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SOUTH EAST ASIAN ASSOCIATION FOR INSTITUTIONAL RESEARCH

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EDITORIAL BOARD

EDITOR'S NOTE

Welcome to this edition of JIRSEA.

Although the SEAAIR Executive Committee planned two editions of JIRSEA for this year, various events, including the publication of a SEAAIR Book, a new venture by SEAAIR and supported by American AIR, had precluded realizing this plan, at least at the time of editing this issue.

JIRSEA Editorial Board continues to apply the quality and standard criteria for papers to be included in this journal. As in the previous edition of JIRSEA, we also include in this edition papers that were not previously presented at a SEAAIR conference.

In this edition we have eclectic origins of papers. From Indonesia we have a paper advocating the establishment of regional accreditation bodies, from Thailand and Australia a joint paper addressing generational dimensions on teaching and learning while from Malaysia there are three papers, the first dealing with students' perceptions on generic skills, the second on testing hypotheses on customer relationships in an academic setting and the third suggesting higher education institutions to learn from development in business management in order for these institutions to address various shortfalls in their management.

I believe this is another stimulating edition for those involved in or are contemplating to manage higher education institutions or wishing to embark on institutional research.

Further information on the SEAAIR Book will be made as soon as it is available.

For those who wish to contribute to JIRSEA please visit our website http://www.seaair.info, also for further information on any aspects of SEAAIR activities.

Happy reading,

Nirwan Idrus
Editor

Academic Quality Improvement:
The need for regional accreditation agencies in Indonesia

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Abstract

With the rapid increase of higher education study programs in Indonesia, the National Accreditation Board (BAN-PT) is charged with institutional accreditation to assure their quality. BAN-PT was established in 1994. In the thirteen years of its existence, BAN-PT had only managed to accredit about 50% of study programs in the country. A major challenge for BAN-PT is clearly the number of study programs that need to be accredited and the geographical area to be covered by Accreditation Panels. Such centralized control and management appear to need a fundamental review and its roles to be devolved. This paper explores the development of Quality Assurance in Higher Education in Indonesia and recommends the establishment of Regional Accreditation Agencies in order to carry out BAN-PT functions in the various regions of Indonesia. These Regional Accreditation Agencies should then be accredited by BAN-PT.

Keywords: *Accreditation, quality assurance, regional accreditation agencies*

Introduction

Higher Education in developing countries has been particularly hit by various crises that had been suffered by these countries in the last two decades or so (World Bank, 1998a). The Asian Monetary Crisis in the second half of the 1990's for example, had devastated Indonesia's economy and the ripple effects touched almost if not all aspects of lives in the country. The difficulty in curbing population growth added to the crisis that hits education in general and Higher Education in particular. The limited number of public universities has exacerbated the situation with respect to higher education in Indonesia. This also had heightened the need for ensuring the quality of study programs, particularly in private universities and other higher education institutions. The latter enrolls many more students than the public universities.

However, as changes are globally inevitable, they also brought significant improvements in higher education in Indonesia. The application of new educational technology for example had helped to enhance access to higher education and introduced new ways of teaching and learning. Nevertheless, all these had also heightened concerns about the quality of higher education study programs.

In Argentine for example, the National Commission for University Evaluation and Accreditation (CONEAU) (World Bank, 1995) serves as the major agency for quality enhancement and assessment in higher education there. Its major missions are:

a. to promote the process of self-evaluation by public and private universities
b. to consolidate and extend external evaluation of universities
c. to accredit undergraduate programs of public interest and graduate studies in all disciplines.

In Romania, institutional management has been emphasized as the pathway to assuring quality of higher education study programs (World Bank, 1996a). The country's new Education Act replaced the centralized Ministry of Education's control with an oversight role of intermediary councils which are semi-autonomous. These are the National Council on Accreditation and Academic Evaluation, the National Council on Academic Titles and Degrees, the Higher Education Financing Council and the University Research Council. The National Council on Accreditation and Academic Evaluation had helped to revitalize and ensure the quality of academic programs. The succession planning of academics is done by way of developing post-graduate programs which are taken by potential future academics in the country.

The range and extent of quality assurance systems also vary from country to country (El-Khawas, 1998). For example, Scotland and England have procedures to monitor teaching effectiveness, while Hong Kong focuses on high-quality management processes. Other systems were established to award licences to new institutions or to certify education credentials. Still others concentrate on research productivity and so on.

In Brazil the Federal Council of Education approves the charters of new institutions and accredits courses. Chile on the other hand is yet to finalize the transition from an elite higher education system to a massified one (Eisemon and Holm-Nielsen, 1995; World Bank, 1998b).

Higher Education in Indonesia is designed to comprise teaching, learning, research and community service. Consequently quality assurance of higher education in Indonesia involves assuring the quality of those four areas (DGHE, 2003). The accreditation of higher education institutions in Indonesia or study programs offered by them is conducted to assure the quality of those activities (BAN-PT, 2006).

While BAN-PT was established in 1994, it started its first evaluation in 1996. In the decade between 1996 and 2006, BAN-PT accredited 54% of the programs being taught by higher education institutions throughout the country, or 10, 995 out of 17,800 study programs approved by the Ministry of National Education.

Accreditation by BAN-PT follows the general trend elsewhere in that the evaluation is done through peer-reviews. It appoints Accreditation Panels comprising assessors with appropriate expertise and experience in the relevant areas who will assess and evaluate the application and supporting documents for the program to be accredited. The accreditation process would start with self-evaluation by the institutions.

BAN-PT accreditation

BAN-PT uses 15 accreditation standards that the Accreditation Panels apply to the study programs that submitted for accreditation. These include:

a. eligibility
b. integrity
c. vision
d. mission
e. objectives
f. purpose

form the first BAN-PT Standard to be met.

The student information and database form the second Standard and covers the recruitment system and information on students.

The third Standard is about the quality of the Human Resources and the fourth is the Curriculum.

The other Standards involve infrastructure, financial, governance, management system, learning system, academic environment, information system, internal quality assurance system and about the graduates.

The penultimate is the Standard involving research, publication, innovation and community services and last but not least is about the quality of the study programs themselves.

The roles of stakeholders in determining the quality of study programs are increasingly underlined and accountability is expected. Questions such as “What are the students learning?”, “Is it the right kind of learning?”, “What difference are you making to their lives?”, “What evidence do you have that you’re worth our investments?” must be answered with appropriate evidence and support.

The geographical spread of Indonesia and the varying stages of development of the various provinces across the archipelago, create a real challenge for BAN-PT. To complicate matters, the gaining of the ISO-9000 series certification is treated by recipients as a marketing advantage and tool, while in truth the award of such certification only signifies the achievement of the minimum requirements of the recipients’ quality management system. In addition, in practice, the gaining of the ISO 9001:2000 certification simply signifies the ability of the recipient to enhance consistency of its products. Thus if the quality of the products is good, the application of the ISO 9001:2000

standards will simply ensure that all the products are of good quality. However, if the recipient has been producing bad products, the application of the Standard will therefore consistently produce bad products. The Standard does not improve the quality of the products or in the case of higher education, its graduates.

That there are more than ten times more private higher education institutions in Indonesia than public ones, also poses additional problems for BAN-PT.

The BAN-PT accreditation process is shown in Figure 1.

As the types and sizes of higher education institutions in Indonesia are many and varied, not all of these are eligible to apply for accreditation by BAN-PT. Study programs in Indonesia normally have either a "Registered" status, "Accredited" or "Equivalent to an established program" one. The impacts of the status normally affect enrollments in those institutions.

Thus the process of BAN-PT accreditation starts with the eligible institution submitting an application for accreditation. If BAN-PT agrees that *prima facie* the program or institution is worth accrediting, it will then respond by sending the self-assessment instrument to the institution.

The institution then carries out its self-evaluation process, culminating in the preparation and writing of the self-evaluation report(s) which are submitted to BAN-PT. BAN-PT will then form an Accreditation evaluation panel as previously mentioned. This panel then studies the submitted reports and formulates its approach for the site-visit to the institution.

Following the site-visit the Panel then deliberates on its finding and decides if the institution and/or its study programs submitted for accreditation can in fact be accredited. In many cases corrective actions are needed either on the institution's quality management system or its study programs before accreditation is awarded, in which case the Panel will need to re-convene at a later date when the corrections and corrective actions have been carried out by the institution.

Given the many challenges that BAN-PT faces as alluded to above, the ideal process stated is seldom achieved and hence as the statistics showed only 54% of approved study programs in the country had been accredited over the ten years between 1996 and 2006. The ramifications of this state of affairs are that the quality of half of the approved courses and perhaps also the quality of the institutions offering them are doubtful, which in turn impacted on the quality of the resulting human capital in the country.

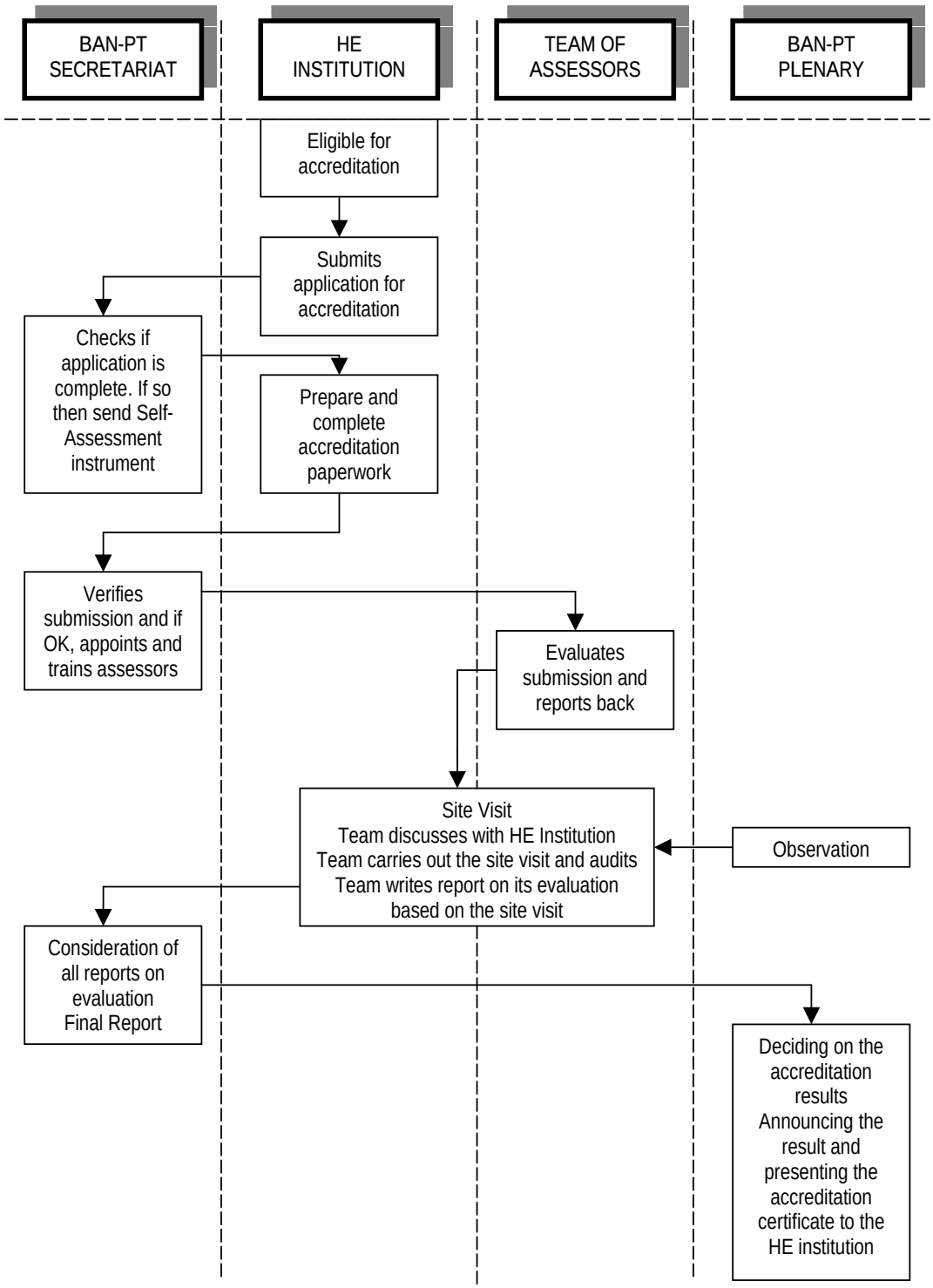

Figure 1 – *Sequence of accreditation processes in the Indonesian Higher Education system*

This paper therefore contends that regional accreditation agencies are needed not only to expedite the accrediting of the rest of the approved study programs, but to continue to ensure the quality and standards of approved study programs in all parts of the country. It further contends that such agencies will reduce the instances of unfair benchmarking for currently the members of the Accreditation Panels are normally recruited from among academics in larger and wealthier provinces. The benchmarks in this case may not be relevant to the institutions being accredited or that the aims and objectives of regional higher education institutions are not appreciated by these panels (Aiyen, 2006).

This is exacerbated by the observation that these Panels are still carrying out audits on the basis of standards rather than fitness for use, as is the practice now in Australia and elsewhere (Woodhouse, 2006). In the case of auditing based on fitness for use, the Panels' tasks changed from checking that the institution or its study programs meet the requirements of the standards, to verifying that the institution's management and learning objectives are met and the learning outcomes are achieved. The Panels however should still offer recommendations to improve the institution's quality management system and good practices in order to enhance its performance as a whole (McKinnon et al, 2000).

Naturally a new approach in management at the institutional level is needed. At the same time this paper contends that a regional accreditation agency would be more *au fait* with the aims and objectives of institutions in its geographical area and would therefore be more able to offer relevant recommendations than Panels emanating from Jakarta (Tilaar, 2006).

Regional Accreditation Agency

Subject to broader coordination and monitoring, the preferred location of academic quality is as close as possible to the actions, in the case of the Indonesian Higher Education, the activities of teaching, learning, research and community service in the regions (AQUA, 2006).

Such monitoring in the case of Indonesia is a tall order indeed. The country is made up of more than 17,000 islands stretched over 3000 kms of which two-thirds are water (Tilaar, 2002; Baiquni, 1999). Such challenges do not only face the higher education sector but almost all sectors that deal with communities. This was recognized by the Indonesian Government when it established the Ministry of Eastern Indonesia in 1999.

Regrettably, while this Ministry was supposed to assist this region of the country, it continued to use benchmarks that apply to the western or more developed part of Indonesia. The results of these incompatible policies manifest themselves in various failures of initiatives in the eastern part of the country, that led to the abolition of the Ministry in 2004.

Along similar lines, even if BAN-PT is able to expedite the accreditation of the other 46% of the approved study programs, the real problems as shown above, will not guarantee that *fitness for purpose* as the basic definition of quality is likely to be achieved in the regional higher education institutions.

The other real problem that BAN-PT faces on a continual basis is the dearth of qualified assessors or quality accreditors. This is brought about by the relatively small number of qualified academics in the country, who are spread too thinly across both the public and private universities. It is also a known fact that many if not most academics in public universities are also teaching in private universities and are involved as both staff and consultants in industry. The remuneration from these activities is obviously more lucrative than being a BAN-PT Accreditation Panel member. Hence, either their involvement in the Panel is subject to their schedules in their other activities, thus delaying the accreditation for example, or that they kindly declined to be involved. It is also of course the case that those in demand by industry and other universities are usually the better academics and these are the ones that BAN-PT are not able to attract. The consequent quality of the Panel is therefore affected, and in turn the resulting quality of the institution and in its turn the graduates being produced by that institution which again compromises the human capital in the country.

Given all the above, this paper therefore recommends that the Ministry of National Education review and revamp the terms of reference of BAN_PT and establish regional accreditation agencies, *Badan Akreditasi Regional-Perguruan Tinggi* or BAR-PT.

The BAR-PT can be set up on the basis of geography, so that for example BAR-PT 1 say for the Western part of Indonesia, BAR-PT2 for Central Indonesia and BAR-PT3 for Eastern Indonesia. Alternatively, BAR-PT1 could be dealing with Physical Sciences study programs, BAR-PT2 with Social Sciences and BAR-PT3 with Educational fields. Yet another alternative is hierarchical in that BAR-PT1 could be benchmarking at the highest possible level, BAR-PT2 at a lower level and BAR-PT3 at the lowest level. In this case institutions could request to be audited by any of these BAR-PTs depending on their own confidence. While in the previous two cases the agency accreditation has to be done by BAN-PT the national accreditation board, in the last case only BAR-PT1 needs to be accredited by BAN-PT while BAR-PT2 could be accredited by BAR-PT1 and BAR-PT3 by BAR-PT2.

Extending the argument about the regional accreditation agencies, they could in fact be independent of any bureaucracy and perhaps could as a result become more efficient and effective. Such a model already exists in Australia (AUQA, 2006). In this case the roles of BAN-PT would perhaps move to policy making, monitoring and review of the BARs or other accrediting agencies. In this way much more time could be afforded by BAN-PT for developing appropriate quality policies on higher education that could be fed back to the Ministry of National Education for higher policy development.

While several different models of Accreditation Agencies have been discussed above, it is important that their terms of reference (TOR) are made as clearly as possible. These should include the following:

1. the new model must be an improvement on the centralized BAN-PT model currently in place, that is, it must eliminate all the drawbacks of the current system
2. the new model must meet the requirements of the institutions and stakeholders
3. the new model must be both effective and efficient

4. the new model must make real and measurable contributions to the quality of institutions and study programs
5. the new model must cause institutions to improve their educational services to their students and stakeholders as a priority
6. the new model must also underline three major perspectives, namely *actors*, *purposes* and *processes*. *Actors* must be as comprehensive as possible, from the grantor of funds and licences to the recipients of the result of their studies in that institution and their future employers. Similarly with *Purposes* it is important that the accreditation agency recognizes that accreditation and evaluation have their social functions as well. To date much effort and funds have been concentrated on the *Processes* only.

Conclusion

This paper showed that accreditation is both a process and a product. As a process, BAN-PT in Indonesia evaluates and verifies the quality status of higher education institutions based on pre-determined standards. As a product, accreditation is a status of institutions or study programs that they have gone through the process and passed it.

As a process the accreditation is in fact standards-based rather than *fitness for use*-based as is increasingly being used elsewhere in the world. It is important that such a change be considered seriously also by BAN-PT. This should lead to the potential establishment of regional accreditation bodies as differing objectives and outcomes are held by the different institutions throughout the country.

Much emphasis must also be placed on continuous quality improvement rather than just achieving the specified quality standards by institutions with little if any plans to continuously improve. Effective monitoring and assistance would be better facilitated by regional accreditation agencies than a centralized BAN-PT.

In addition this would relieve BAN-PT to concentrate more on higher level national higher education quality agenda that would ensure that Indonesia is closely behind trends and practices of quality assessment and improvement in the world, rather than carrying out those that have become obsolete.

Acknowledgement

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THE PERCEPTIONS OF MALAYSIAN UNDERGRADUATE STUDENTS ABOUT A SET OF GENERIC SKILLS

Mohd Lazim Abdullah and Abdullah Sani Kamaludin

Abstract

This article reports the perceptions of Malaysian undergraduate students toward a set of generic skills using a factor analysing approach and explores the relationships between factors. A Generic Skills Survey was employed as the basis of this investigation and distributed to undergraduate students from three public universities in Peninsular Malaysia. A factor analysis of 460 responses identified five dominant skills in a set of generic skills. Correlation tests indicated that all skills were significantly correlated. It was concluded that the five skills became an integrated entity of the set of generic skills perceived by Malaysian undergraduate students. Statistical evidences in exploring the generic skills were presented and some implications in the context of Malaysian were discussed.

Keywords: *Generic Skills, Malaysian undergraduate students, University Education, Dominant Skill of Skills*

INTRODUCTION

University education is expected to produce versatile graduates that can meet the job demanding market. During the undergraduate years, the students are trained in their core specialization subject. They are urged to benefit from their knowledge areas and become experts in new and different working environments. But in the midst of seeking fresh employment, employers are stressing on the importance of 'other knowledge'. Employers frequently comment on the need for their recruits to possess abilities other than those relating to academic knowledge of the discipline they studied as students. Employers prefer workers who have competencies like interpersonal skills, leadership skills (Mason, 1992; Quek, 1996a; Lee, 2000), teamwork (Ball, 1989; Kanapathy, 2001; Boud and Middleton, 2003), and oral and written skills (Schroder, 1989; Jacobsen, 1993; Lee et al., 2001) for work performance. These non-discipline specific competencies are developed in and around degree programs they have engaged in throughout their undergraduate days.

Thinking along the needs of employers, there is a growing awareness among educators today that effective university teaching and learning extends far beyond the development

of skills and knowledge in specific subject domains (Dearing Report, 1997). A holistic view of education suggests other form of skills knowledge that many argued are important outcomes of a university education. For example, Candy et al.. (1994) argued that some forms of holistic lifelong learning skills should form the core of every undergraduate degree with some emphasis evident in every unit of the degree. The competencies and knowledge, which form the basis of these lifelong education skills, are often referred to as generic skills (Oliver and Mc Loughin, 2001). The generic skills are the skills that students need to become successful learners and successful practitioners in their field of study and work and other aspects of their life and are an important outcome of university education (Havard, Hughes, & Clark, 1998).

Defining the full range of generic skills that are useful for university students is an unending process. In different countries, different sets of skills are listed, all with similarity and consistency to each other. The 1993 New Zealand Curriculum Framework proposed eight essential skills as important outcomes of New Zealand schooling. These were communication skills, information skills, self-management and competitive skills, physical skills, numeric skills, problem solving skills, cooperative skills, work, and study skills. In the United Kingdom, The Qualifications and Curriculum Authority (QCA) developed a set of generic skills that the government and much of industry consider as essential for successful lifelong learning and a flexible workforce. The QCA generic skills are comprised of six main areas, communication skills, information technology skills, application of numbers, skills in working with others, skills to improve learning and performance, and problem solving.

It is almost exhaustive in finding agreement in the terms best be used to describe the set. In light of getting a general definition of generic skills this paper discusses views propounded by enthusiasts of university education in the development of skills among undergraduate students. For many years, there has been an interest in the concept of generic and key skills as outcomes of education. It was perhaps the Finn Report (1991) which introduced this concept in Australia. The Finn Report used the term key competencies to describe 'certain essential things that all young people need to learn in their preparation for employment'. The subsequent Mayer Committee (1992) further clarified the concept of employment related key competencies in compulsory education and training. The key competencies proposed by the Mayer Committee included collecting, analysing and organising ideas and information, expressing ideas and information, planning and organising activities, working with others and in teams, using mathematical ideas and techniques, solving problems and using technology.

Alternatively Crebert (2000) defines the generic skills in the following way. The skills tailored for Griffith Graduates among others were:

- Oral communication which emphases the ability of graduates to communicate confidently and effectively with a range of audiences, in a variety of oral modes, and using a number of different means.
- Written communication in which graduates will become skilled in using the conventions of their disciplinary discourse to communicate effectively in writing with a range of audiences, in a variety of written modes, and using a number of different means.

- Problem- solving needed by graduates to be able to identify, define and solve problems using logic and lateral thinking.
- Analysis meant to graduates to be able to refine problems and issues into their component parts, explore their significance and interrelationships, and synthesise the parts back into a whole.

Crebert (2000) also included the skills of critical evaluation, information literacy and teamwork to complement his definition of generic skills.

It would appear that the definitions mainly focus on a set of individual skills, which can be brought through daily living. Many terms still surround and have been used to conceptualise the generic skills. They are described by a number of synonyms including personal, transferable, generic, common, work and employment related skills. In university teaching, the skill set is often narrowed to focus on those that are not taught as discrete components of coursework. At the same time, the generic skills sought by university education assume learners are numerate and literate as consequence of requirements of university entrance. Most of the universities tend to include the generic skills as the skills that students need to develop to becoming successful and self-sufficient leaner; these skills include for example information literacy, metacognitive skills (Candy et al. 1994). Other literature indicates that the generic skills for university graduates should include the development of intellectual and imaginative powers, understanding and judgement, problem solving skills, critical thinking skills and an ability to see relationships (Ramsden, 1992).

The noble ideas of generic skills need to be cultured in university education prior to transferring to the workplace. However, what has been planned does not always end with satisfying outcomes. According to Mason (1992), Sear (1994), Quek (1996a) and Billett (2001), in the early 1990s university education in some countries typically contained curricular materials that were far less attuned to these skills. In addition, it was reported that at present, to some degree the scope of education in universities in the USA, the European Community and the Asia-Pacific region, including Malaysia (Mason, 1992; Chew et al., 1995; Lee, 2000; Lee et al., 2001; Minister of Education, 2000; Shah, 2001), is highly academic, with a strong emphasis on scholastic outcomes in the academic achievement of graduates. To some extent it can be argued that at present, the inclination of the tertiary curriculum in Malaysia is towards the preservation of traditional and academic values and excludes the skills needed at the workplace (New Sunday Times, 2002; New Straits Times, 2004c).

Besides the problem of imbalance between academic values and skills, the present practice in skills development among undergraduate students is an interesting investigation. Introducing the teaching of generic skills into courses poses practical problems for universities, faculties and for individual teachers. One response has been to adopt a market-research approach, and survey graduated students to ascertain the effectiveness of existing practice with the graduates perceived needs. Nabi and Bagley (1999) surveyed graduates from a range of disciplines ranging from science, engineering, economics, and psychology to history at the University of Central Lancaster, England. The participants were asked to rate the importance of a number of skills and also to indicate how well they felt they performed in these skills. Athiyaman (2001) surveyed Bachelor of Business graduates regarding the importance of various skills and attributes in their careers and the

role of tertiary education in the development of these skills. These graduates identified six skills as highly important but also noted that these skills were not sufficiently developed. Leggett et al. (2004) also outlined the results of a survey of staff and undergraduate students. Student perceptions could be useful in describing the importance of generic skills. Again, this research provides insights into students' perceptions of their undergraduate experience and lists a number of skills believe to be highly valued among Malaysian undergraduate students.

RESEARCH OBJECTIVES

This research aims to provide statistical evidence in describing a set of generic skills perceived by Malaysian undergraduate students. Specifically the objectives of this study were

i. to list the selected items in the factors as perceived by undergraduate students
ii. to identify the most dominant skills perceived by undergraduate students
iii. to identify if any relationships exist between the dominant skills.

The outcomes of this research will have implications in the assessment of students' generic skills development and should be of interest to the education policy makers of universities and graduate recruiters.

RESEARCH METHODS

Instrument and Sample

The Generic Skills Survey, Institutional Research, The University Western Australia (1996) was employed as the original source of instrument. Development of the instrument was done by Stuckey and Kelly (1996). This sixty items instrument has gone through translation process to meet the need of Malaysian students. A pilot was developed and trialled to the 87 undergraduate students from a public university. An initial reliability coefficient Cronbach alpha yielded an acceptable 0.8834. Litwin (1995) suggests that 0.7 or better is generally accepted as representation of good reliability. The questionnaire was revised in the light of their responses and a final version constructed. After reducing the number of items systematically, the reliability coefficient raised to 0.9021. The final version of questionnaire contained 54 items that are scored on a five point Likert-Scale from 1 (completely disagree) to 5 (completely agree). The final version was offered to 460 undergraduate students of three public universities. 278 undergraduate students were in the fields of science such as computer science, pharmacy, food technology and chemistry while 182 undergraduate students were in the fields of social sciences such as education, law and political science. Among these undergraduates, 343 were female students from different fields of study. The sample appears to be biased in favour of female students and noted as a limitation of the study.

Analytical Procedure

The process of listing a number of selected items in the factors and attaining a list of the dominant skills in the set of generic skills and their loadings was solely justified from factor analysis. In this study, factor analysis was employed to ascertain the minimum number of factors that could be accounted from the observed covariation among factors. A statistical indication of the extent to which each item correlated with each factor was given by the loadings. In other words, the higher the loadings, the more particular items

contributed to the given factors or skills. Prior to analysing the data using factor analysis, data collected in this research went through Barlett's Test of Sphericity meant to measure the applicability of factor analysis. Kaiser-Meyer-Olkin Measure of Sampling Adequacy was recorded at 0.900 (>0.5), hence it was appropriate to use factor analysis in determining the number of factors to be retained and loading factors on the items. The second analysis was the correlation between skills. The correlation between identified skills was established using Pearson Correlation at a 0.01 level of significance.

RESULTS

Selected Items and loadings

One of the main purposes of factor analysis is to reduce the number of variables to a smaller number. In this study, factor analysis was used to derive the new variables, which were called factors which will give a better understanding of the data. Characteristics from the items of the instrument of generic skills measurement, which go together, constitute a factor. One of the criteria in deciding which factors were to be excluded was Kaiser's criterion. In respect to determining the number of factors to be extracted, Thurstone (1974) recommended accepting those with eigenvalues in excess of 1-described by Child (1970) as the Kaiser criterion. Goddard & Kirby (1976) and De Vellis (1991) suggest that the Kaiser Criterion equates to accepting 'only those factors that account for more than their proportional share of the original variance' (Goddard & Kirby, 1976, p.24). As shown in Table II, there are thirteen factors which have the eigenvalues more than one hence it was understandable that these thirteen items could be extracted. The thirteenth factor recorded eigenvalue at 1.08 with 1.904 % of variance and the first factors punctuated at 11.033 with 20.432 % of variance.

Table I1. Initial Eigenvalues of First Thirteen Factors and Their Variance

	Initial Eigenvalues		
Factor	Total	% of Variance	Cumulative %
1	11.033	20.432	20.432
2	2.866	5.307	25.739
3	2.616	4.844	30.583
4	1.992	3.689	34.272
5	1.953	3.617	37.889
6	1.547	2.865	40.755
7	1.506	2.790	43.544
8	1.354	2.507	46.051
9	1.344	2.489	48.540
10	1.232	2.282	50.822
11	1.162	2.151	52.974
12	1.078	1.996	54.969
13	1.028	1.904	56.874

Thirteen factors solution accounted for 56.874% of the cumulative variance. Thus, it was a good instrument set to deal with and allowed for the best interpretation. Kaiser's Criterion extracted thirteen factors from the instrument and yet this was not sufficient to identify the

criteria of the items and their respective loadings. Varimax with Kaiser Normalization offers the identification of items for each factor and their respective loading as well.

Dimensionality of the factors was explored by analysing all item factors. Process of orthogonal rotation of two principal-component factors is known as varimax. The 54 items of the questionnaire were subjected to factor analyses principal component with varimax rotation (Varimax with Kaiser Normalization), which is a statistical technique to identify relatively small numbers of factors that can be used to represent relationships among a set of many interrelated variables (Norusis, 1990). The relationship between each item and a factor is expressed as a correlation or loading. In order to increase the interpretability of factors, they were rotated to maximise the loadings of some of the items. The two most commonly used methods are orthogonal rotations which produce factors that are unrelated to or independent of one another and oblique rotation in which the factors are correlated (Bryman & Cramer, 2001). Data from this study was analysed using orthogonal rotation since the factors were presumed to be unrelated.

The thirteen factors were scrutinised to conceptualise items prior to naming. In this paper, items with loaded greater than 0.6 were considered as the selected items, which was sufficient to give a robust interpretation and conceptualisation. Zekeri (2004) proposed that in evaluating the contribution of the items to the factors, the criterion of loadings greater than 0.6 was used because of the small sample size. The number of items loaded less than 0.6 reflects a weakness in the correlations between each item and each factor. In other words, the lower the loading, the lower the particular item contributed to the given factor. It can be observed that four items on Factor 1 loaded greater than 0.6. Items with such highly loadings on Factor 1 included the following. 'Higher education develops my ability to think for my self', 'Higher education strengthens my emotional health and wellbeing' and 'Higher education develops a respect for other people'. Two examples of items that have a high loading (> 0.6) on Factor 2 were 'I can developed my abilities to synthesize and integrate information and ideas' and 'I can developed my abilities in analytic skills. Items that considered having a high loading on Factor 3 were 'I Shall trust my team mates' and 'I shall meet them regularly'. Other factors and selected items bearing loadings more than 0.6 are summarised in Table IV

Table IV: Factors and the Selected Items

Factors	Selected Items*	Loadings
1	Improve myself-confidence/self-esteem	0.699
	Strengthen emotional health and well-being	0.686
	Develop a respect for other people	0.679
	Strengthen my commitment to honesty	0.651
	Develop my ability to think for myself	0.641
2	I can developed my abilities to synthesize and integrate information and ideas	0.675
	I can developed my abilities in analytic skills	0.671
	I can developed my abilities in problem-solving	0.625
3	I shall trust my team-mates	0.698
	I shall meet them regularly	0.667
	I shall be honest to my team-mates	0.627
	My team-mates and I will manage our time well	0.608

4	I have created a multimedia presentation using computer software (e.g., Power Point)	0.695
	I have use a graphical program or spreadsheet (such as Excel) to present information	0.690
	I have used a Windows based computer system	0.634
	I have used a word processor to write a working paper	0.613
	I am proficient in one or more computer programming languages	0.601
5	I motivate others in the group to be productive	0.671
	I plan daily or weekly schedule in advance	0.602
6	I understand what sexist behaviour is and try to exhibit non-sexist behaviour	0.780
	I interact with and appreciate people from ethnic background differently own.	0.745
	I understand what racist behaviour is and try to exhibit non-racist behaviour.	0.647
7	I am able to make decisions without feeling pressured	0.698
	I am able to make effective decisions	0.682
8	I listen carefully and respond to verbal and non-verbal messages	0.649
	I respond appropriately to positive and negative feedback	0.643
9	I have made a formal speech to a large audience	0.773
	I frequently make formal presentations to large groups	0.690
10	I shall ignore the problems and pretend they are not happening	0.726
	I shall let someone else to handle the problems	0.712
11	I have authored or co-authored articles for publications	0.829
	I have written extensively for newspapers or periodicals	0.818
12	I shall talk to someone who can solve problems	0.737
	I shall ask someone whom I respect for advice and follow it	0.673
13	I have effective telephone skills	0.649

*** Selection based on loadings greater than 0.60**

Dominant Skills

Apart from the strength of the loadings, the number of items converging at a factor also reflects the dominance of the factors. Hence the extracting process should be done one step further. Table IV provides additional information to narrow the dominant factors and subsequently list the best factors that describe the pattern of generic skills perceived by Malaysian undergraduate students. It can be clearly seen that there were thirteen factors with 35 items extracted. In spite of the existence of the items in every factor, it was worthwhile to note that the majority of items (over 50 %) were recorded in five factors. Loadings, number of items and factors with eigenvalues greater than one were considered to recognise Factor 1, Factor 2, Factor 3, Factor 4 and Factor 6 as the dominant factors. Seven factors recorded two items and one factor has a single item. The items insufficiency

in the eight factors has caused inadequate interpretation of the items and factors. It seems very difficult to identify skills for these particular factors. Hence, the skills proposed in the instrument, Kaiser's Criterion and Varimax with Kaiser Normalization rotated component matrix have clearly offered comprehensive evidence in exploring the set of generic skills perceived by Malaysian undergraduate students. Accounting for all the statistical evidence and the original instrument, this study has identified five dominant skills in the set of generic skills. The instrument helps to conceptualise the five dominant skills which can be named as Factor 1: Personal Development Skills, Factor 2: Thinking Skills, Factor 3: Work in Team Skills, Factor 4: Computer Skills, and Factor 6: Ethics and Tolerance Skills. The five dominant skills derived from a set of generic skills were finally identified as the preferred skills as perceived by Malaysian undergraduate students. These dominant skills were extracted from a single instrument and hence it was indeed a great anticipation to further explore their relationship.

Correlation between dominant skills

Correlations were calculated between each pair of skills to determine any interactions between them. Skill 1: Personal Development Skill had a moderately strong correlation with Skill 2: Thinking Skills (Hair et. al., 2003). Also, Skill 1: Personal Development Skills demonstrated a correlation value of 0.490 with the Skill 5: Ethics and Tolerance Skills. This value indicated that the relationship was slightly strong (Hair et. al., 2003). Most of the other correlation coefficients appeared small but significant at the level of $p < 0.01$ (see Table V). Therefore it was acceptable to conclude that these skills were vital in explaining the preference skills as perceived by undergraduate students. Moreover, the correlations happen to reflect the manner in which the five skills influence each other and further discussions will follow to substantiate the importance of these skills in the Malaysian socio-cultural.

Table V: Correlation and their associated probabilities calculated between the five skills identified by the factor analysis. Significant probabilities have been boldened.

Skills	Personal Development	Thinking	Work in Team	Computer
Thinking	**0.527			
	0.000			
Work in Team	**0.384	**0.339		
	0.000	**0.000**		
Computer Skill	**0.141	**0.177	**0.125	
	0.000	**0.000**	**0.001**	
Ethics and Tolerance	**0.490	**0.343	**0.371	**0.232
	0.000	**0.000**	**0.000**	**0.000**

** Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

The aims of this paper were to identify the best skills constituted in the set of generic skills perceived by Malaysian undergraduate students and to examine the possible relationships between factors. Initially, this study identified thirteen factors and subsequently dropped eight factors due to unpromising items and reduction of factors in factor analyses

procedures. Finally, factor analyses and other statistical procedures identified five factors which eventually become the best skills perceived by Malaysian undergraduate students. The items loaded in every factor pave the way to recognising the skills. These skills were conceptualised as Personal Development Skills, Thinking Skills, Work in Team Skills, Computer Skills, and Ethics and Tolerance Skills. These findings were subtly different to a study conducted by Zekeri (2004) due to differences in the nature of respondents. But some of these skills seem to overlap and should be considered for public scrutiny. He proposed a list of skills needed to improve the careers of students as oral communication, written communication, problem solving techniques, motivating and managing others, and setting personal and organizational goals. Another different set of skills was reported by Quek (2005). In a study of graduate employees' generic competencies, she highlighted interpersonal skill, knowledge-acquiring skills and flexibility as being highly important in contributing toward success in work performance. With differences in setting and student cohorts, the common set of skills which are applicable to all facets of their lives is not conclusive. Instead, skills which provide a glimpse definition of certain skill considered relevant in discussing the skills perceived by the Malaysian undergraduate students.

The five skills in the set of generic skills mirror values of Malaysian graduates. The first two skills appeared to be the cognitive development of the individual. Personal Development and Thinking Skills are perceived as paramount factors by Malaysian undergraduate students. In order to sustain personal development and cognitive potentials, they must constantly be aware of the importance of personal related skills. Undergraduates as individuals must inculcate a positive attitude towards personal development. Ultimately, these two skills become the core skills that undergraduate students should not only perceive being as important but must also developed prior to developing other social skills.

It was very interesting to highlight the prevalent ethics issues of a multi-cultural society in Malaysia. Malaysian undergraduate students appeared to understand better the skills that are needed in order to restore prosperity, harmony and peace. They understand the importance of tolerant living in plural society like Malaysia. The skill of Ethics and Tolerance Skills provided the evidence. One of the highest loadings recorded on this factor was 'I interact with and appreciate people from ethic background different own'. This finding is unanimous and supports the statement by a minister in the Prime Minister's Department, Government of Malaysia (Utusan Malaysia, 2004). The Minister acknowledged that the level of tolerance among Malaysian is high.

In the era of information technology, Malaysian undergraduate students are not felt to be lagging behind from the rest of other communities of the world. These skills will spur the efforts of the Malaysian Government in leveraging the information and communication technology. Computer Skills are one of the skills that undergraduate students have acquired. Indeed, it is a good indicator to the Malaysian government as this trend has become an essential skills in pursuing the fully-developed nation status by the year 2020. Computer technology is an enabler for Malaysia to achieve the National Vision, which is to attain the status of a developed country by the year 2020 (Percetakan Nasional Malaysia Berhad, 1996, 2001).

Undergraduate students' lives are distinct and not comparable to the lives of working adults. They have an intact circle of friends and work together in whatever activities they endeavour to do. Team Work was one of the dominant skills that students perceived in the set of generic skills. Malaysian undergraduate students firmly believe the importance of cooperation, collaboration and teamwork.

The correlations between the five skills prove to be of some interest. It was quite surprising to note that all factors correlated significantly with others despite variation in strength. Pearson correlation coefficients range from 0.125 to 0.559 indicating the cohesiveness of factors in generic skills exhibited by Malaysian undergraduate students. The discussion is based on a premise that correlation coefficients in excess of 0.5 represent strong relationships between two factors whilst acknowledging that there were also other extremely significant but slightly weaker links. In respect to the five skills the interesting finding was that the Personal Development Skills correlated strongly with Ethics and Tolerance Skills, and Thinking Skills. The indication here was that Personal Development Skills goes in tandem with Ethics and Tolerance Skills and Thinking skills. These skills appear to co-exist in acquiring generic skills. More significantly, the correlations between the different skills indicates that undergraduate students holding a solid set of generic skills. The five skills contained in the set of generic skills converged to a single cluster and form a very sound foundation to characterise undergraduate students. Thus, the set was found to be perfectly plausible as prospective employers seeking the generalist rather than the specialist.

Notwithstanding the skills that were excluded in the set, this study summarises the five most important skills perceived by Malaysia undergraduate students. Adequate provisions and sustainable skills development must be put forward to enhance the undergraduates' potential and more marketable in the workforce. Steps should be taken to equipped undergraduate students with the needed skills to meet the requirements of employers in Malaysia. In a recent press release, the Federation of Malaysian Manufacturers also expressed the view that learning for the workplace would require tertiary institutions to develop in students the right attributes, such as adaptability, dependability, diligence and having a sense of global awareness (New Sunday Times, 2004). These are among the skills that should complement the skills listed in these findings. This study is indicted for a small population of Malaysian undergraduate students and certainly analogous research should be carried out to ascertain or at least complement these findings on a larger scale.

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Academic Computing Assessment Framework: Hypothesis Testing of the Value Chain Relationships

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Abstract

The paper extends the research on the value chain concept of the academic computing assessment framework proposed by Mokhtar *et al*. (2006). The framework was developed using qualitative research on pilot higher education institutions in Malaysia. The framework encompasses six broad academic computing areas: 1) Teaching and Learning Using ICT; 2) Researching Using ICT; 3) ICT Vision, Plan, Policies and Standards; 4) ICT Infrastructure; 5) Information Services; and 6) Institutional ICT Support. The areas are further decomposed into components and indicators, with rubrics describing the different levels of implementation. To investigate the academic computing value chain relationships, a nationwide academic computing survey was conducted. A data set involving seventy higher education institutions in Malaysia is used in the research. Five hypotheses representing the academic computing value chain relationships are identified. The testing of the hypotheses using bivariate correlation analysis, partial correlation techniques and ANOVA supports the academic computing value chain concept proposed by Mokhtar *et al.* (2006) and highlights the generalisability of the academic computing assessment framework to all higher education institutions in Malaysia.

Keywords

Academic computing; higher education; assessment; indicators; survey; mixed-method; principal components analysis; reliability analysis.

Introduction

Academic computing is broadly defined as the use of ICT in teaching, learning and research. Detail definitions by Prupis (1989), Ferrer and Corya (1990), Van Valey and Poole (1994), Nielsen *et al.* (1995) and Carleton University (2001) describe academic computing as the application of ICT to support the primary activities of higher education institution - teaching, learning and research. It involves the utilisation of staff, infrastructure (hardware and software) and services (technology, information content and human resources) which enable and support the management and delivery of academic programmes and research.

Research by UNESCO (2004) found that many Asia-Pacific countries lack the proper framework to assess academic computing in higher education. In having such framework, information on various elements of ICT implementation can be gathered and later be used to guide institutions in the planning and deployment of academic computing initiatives. As Asia-Pacific countries differ widely in regard to the scope and use of academic computing, it would be unrealistic and inappropriate to use a uniform framework for all. UNESCO recommends that a framework be formulated while taking into account important criteria such as local relevance, reliability and robustness.

A framework to assess academic computing at Malaysian higher education institutions has been proposed by Mokhtar *et al.* (2006). This paper extends the research to include the validating of the academic computing value chain relationships suggested by the framework.

The Academic Computing Value Chain Concept

According to Porter (1985), the value chain model basically states that organisations deliver their products and services and create value through their value chain activities. The value chain model describes the activities the organisation performs and links them to the organisation's competitive position. It evaluates which value each particular activity adds to the organisations products or services. The activities consist of two groups: primary activities and support activities. Primary activities are directly concerned with the creation or delivery of a product or service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency.

The concept of value chain for academic computing has been proposed by Mokhtar *et al.* (2006) based on the findings of a case study involving five higher education institutions in Malaysia. Basically, the value chain of academic computing in higher education institutions consists of all activities within the institution that add value to the campus community's experience related to teaching, learning and research. Similar to the original Porter's value chain model, academic computing activities are grouped into primary and support activities. Primary activities are directly concerned with using ICT in delivering the core higher education services. The core services are represented by two academic computing areas, namely Teaching and Learning Using ICT (C) and Researching Using ICT (D). These primary activities are linked to support activities which help to improve their effectiveness or efficiency. There are four main areas of support activities: ICT Vision, Plan, Policies and Standards (A), ICT Infrastructure (B), Information Services (E) and Institutional ICT Support (F). The value chain model for academic computing is shown in Figure 1. The operationalised academic computing framework that details the activities (in the form of indicators) is shown in Figure 2.

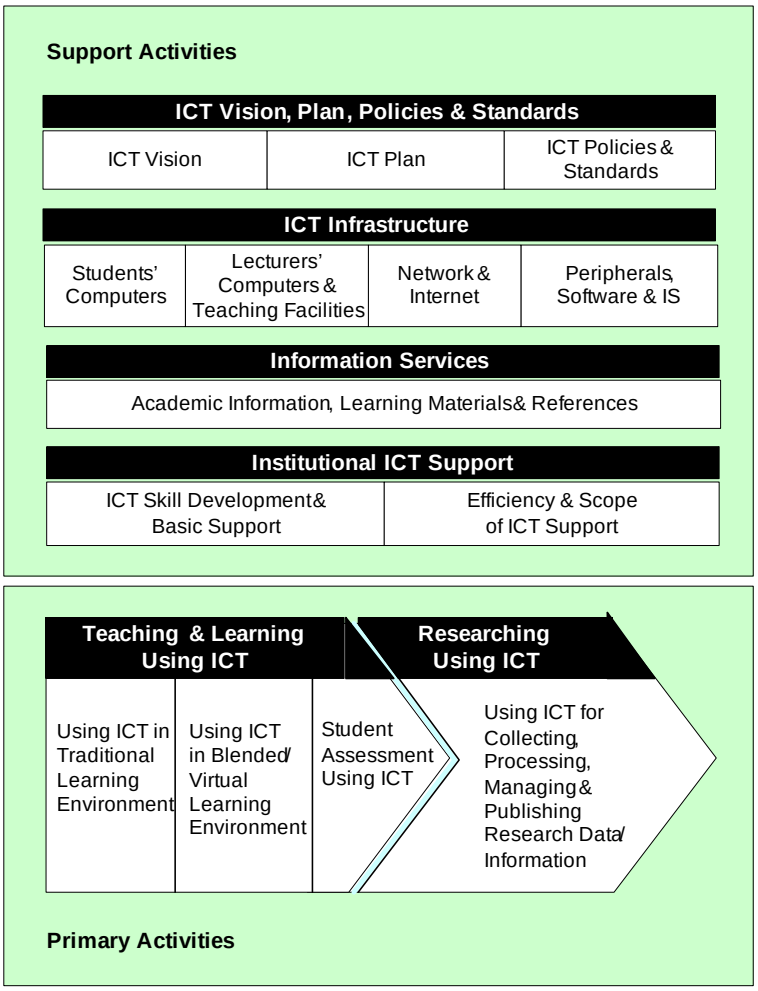


Figure 1: The value chain model for academic computing

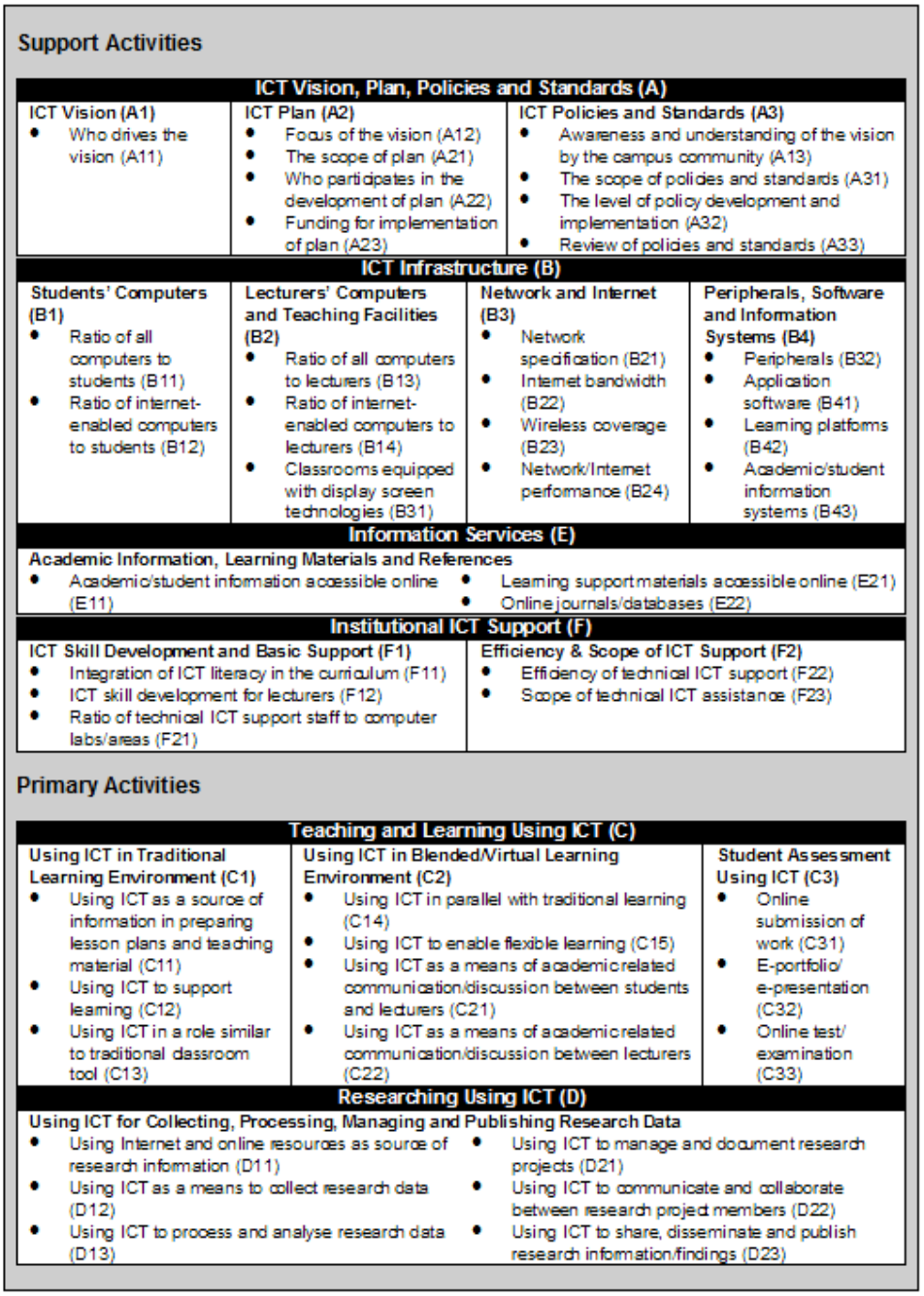


Figure 2: The operationalised academic computing assessment framework

A value chain analysis based on the academic computing model explicitly recognises the interdependencies and the efficiencies resulting from exploiting linkages among value activities across the institution. When a primary activity moves horizontally further to the right of the model, value is being added in terms of improved academic computing implementation. In relation to teaching and learning, research is also considered a value adding activity, as it helps the academics to build on their knowledge and contribute to the continual improvement of curriculum, learning systems and programmes. It ensures a

vibrant academic environment and enables the university to attract and retain good lecturers, while building a strong academic reputation.

The interdependencies and linkages are also true for the support activities. When a support activity moves horizontally further to the right of vertically down the model, value may be added in terms of improved support for academic computing implementation. For example, the deployment of a learning management system (one value activity) significantly increases the institution's capability to implement e-learning (another value activity). These linked activities must be coordinated if the full effect of deploying the learning management system is to be realised. Deploying a learning management system while the supporting ICT infrastructure is still weak will result in a slow and unstable e-learning environment. In addition, the lack of awareness of the importance of the role of ICT in teaching and learning will result in the learning management system being under utilised.

The Academic Computing Survey

To be able to generalise the academic computing value chain model beyond the five pilot higher education institutions of the case study, the model needs to be validated using quantitative techniques based on data representing the whole spectrum of Malaysian higher education institutions. As a result, a nationwide academic computing survey was conducted from July to August 2006. The questionnaire for the survey was developed based on the academic computing rubrics from the framework. The questionnaire together with the supporting documents was sent to three hundred and forty-five higher education institutions listed on the Ministry of Higher Education website (http://www.mohe.gov.my). They represented the various types of higher education institutions in Malaysia. For each institution, a management representative was asked to complete the survey based on inputs from the ICT and academic departments.

During the first phase of data collection (the first four weeks), seventy higher education institutions returned their completed survey forms. In the second phase of data collection (the next four weeks), a second letter was sent to the rest of the higher education institutions asking for their participation. As a result, another twenty completed survey forms were received, totalling the number of participation to ninety. The overall participation from higher education institutions was encouraging and this was better than expected. For validating the value chain relationships of the academic computing model, a data set encompassing the first seventy institutions that corresponded to the first phase of data collection was used. From the seventy institutions, thirty were actively involved in academic research.

Weighting of Academic Computing Areas and Components

In the academic computing survey, the smallest unit of data from the data set is in the form of indicators. The scores of academic computing components and areas need to be calculated from the indicators. Therefore, appropriate weighting of areas and components needs to be implemented. Indicators should be weighted according to the underlying theoretical framework. When used in a benchmarking framework, weights can have a significant effect on the overall composite indicator and the higher education institution

rankings. In this research, participatory methods are used to determine the appropriate weights for each academic computing area and component. Representatives from ten higher education institutions contributed their opinions on what should be the appropriate weights.

In general, many components and all indicators within a component rely mostly on equal weighting, i.e., all variables are given the same weight. This corresponds to the case in which all variables are worth approximately the same in the composite. However, in certain variables, different weights are used to emphasise the different degree of importance. Based on the input received from the representatives, a weighting scheme has been formulated for calculating the areas and components, shown in Table 1. Using the weighting scheme, all scores are converted to a 0 to 100 points range.

Table 1: Weighting scheme for academic computing areas and components

Area/Component	Weight (Component)	Weight (Area)
A: ICT Vision, Plan, Policies and Standards	**1.00**	**0.15**
A1: ICT Vision	0.20	
A2: ICT Plan	0.40	
A3: ICT Policies and Standards	0.40	
B: ICT Infrastructure	**1.00**	**0.25**
B1: Students' Computers	0.25	
B2: Lecturers' Computers and Teaching Facilities	0.25	
B3: Network and Internet	0.25	
B4: Peripherals, Software and Information Systems	0.25	
C: Teaching and Learning Using ICT	**1.00**	**0.25**
C1: Using ICT in Traditional Learning Environment	0.40	
C2: Using ICT in Blended/Virtual Learning Environment	0.40	
C3: Student Assessment Using ICT	0.20	
D: Researching Using ICT	**1.00**	**0.15**
E: Information Services	**1.00**	**0.10**
F: Institutional ICT Support	**1.00**	**0.10**
F1: ICT Skill Development and Basic Support	0.60	
F2: Efficiency and Scope of ICT Support	0.40	

In ICT Vision, Plan, Policies and Standards (A), the components A2 and A3 are both given the weight 0.4 as they have the same number of indicators and are considered roughly equal in their degree of importance. The component A1 is given less weight (0.2) considering that it has only a single indicator. In ICT Infrastructure (B), the components B1, B2, B3 and B4 are equally the weight 0.25. This signifies the equal importance of all the components in the area. In Teaching and Learning Using ICT (C), the components C1

and C2 are both considered more important than component C3. Therefore, the components C1, C2 and C3 are weighted as 0.4, 0.4 and 0.2 respectively. In Institutional ICT Support (F), the five underlying indicators are considered to have equal degree of importance. Proportionate to the number of indicators that form the components F1 (three indicators) and F2 (two indicators), F1 and F2 are weighted as 0.6 and 0.4 respectively. For Researching Using ICT (D) and Information Services (E), no weighting is necessary as each of them have only a single component.

As for the weighting of academic computing areas, ICT Infrastructure (B) and Teaching and Learning Using ICT (C) are considered the most important areas, followed by ICT Vision, Plan, Policies and Standards (A) and Researching Using ICT (D), and finally Information Services (E) and Institutional ICT Support (F). As such, the areas B and C are given the weight 0.25, the areas A and D are given the weight 0.15, and the areas E and F are given the weight 0.10. The weights of all areas add up to 1.00. However, for higher education institutions not actively involved in academic research, the total weight is 0.85 due to the omitting of Researching Using ICT (D). For the calculation of overall academic computing, the score is still converted to a 0 to 100 points range.

Hypothesis Testing of Value Chain Relationships

Five hypotheses are proposed to represent the framework relationships. To test the hypotheses, appropriate statistical techniques including bivariate correlation, partial correlation, ANOVA and significance level calculation are used.

Hypothesis 1

The academic computing primary activities are linked together in a value chain model. The null hypothesis (H_0) and alternative hypothesis (H_A) are represented by the following statements.

H_0: There is no significant relationship between two academic computing primary activities.
H_A: There is significant relationship between the two academic computing primary activities.

The research identifies one relationship item (C–D) that represents the relationship between academic the two academic computing primary activities. Bivariate correlation analysis yields a Pearson correlation coefficient of 0.553, as shown in Table 2. Scatter chart of the C–D relationship shows clustering of points along a regression line (R Sq Linear = 0.307), as shown in Figure 3. The value is significant at the 0.01 level, better than the minimum 0.05 level required to reject the null hypothesis. As a result, the null hypothesis (H_0) is rejected. The proposed hypothesis (H_A), which claims that there is significant relationship between the two academic computing primary activities, is therefore accepted.

Table 2: Correlation between academic computing primary activities

Primary Activities: C: Teaching and Learning Using ICT	Relation-ship	N	Correl.	Sig. (2-tailed)
D: Researching Using ICT	C–D	30	.554**	.001
** Correlation is significant at the 0.01 level.				

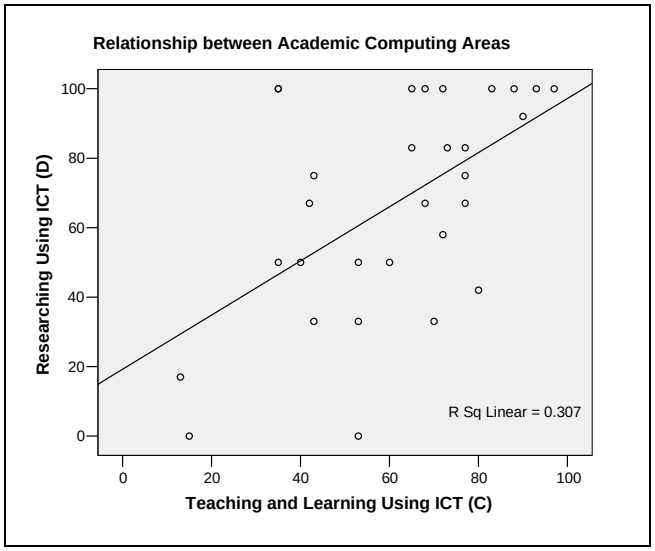


Figure 3: C–D relationship

Hypothesis 2

The primary activities in a value chain model are linked to support activities which help to improve their effectiveness or efficiency. The null hypothesis (H_0) and alternative hypothesis (H_A) are represented by the following statements.

H_0: There is no significant relationship between academic computing support activities and primary activities.
H_A: There is significant relationship between academic computing support activities and primary activities.

The research identifies eight relationship items that represent the relationship between academic computing support activities and primary activities. The relationship items are labelled A–C, B–C, E–C, F–C, A–D, B–D, E–D and F–D. Bivariate correlation analysis yields Pearson correlation coefficients ranging from 0.453 (A–D) to 0.758 (B–C), as shown in Table 3. Scatter charts of eight relationship items all show clustering of points along respective regression lines, as shown in Figure 4(a) through Figure 4(h). The correlation values of seven relationship items are significant at the 0.01 level while one relationship item (A–D) is significant at the 0.05 level. These results exceed the minimum 0.05 level required to reject the null hypothesis. As a result, the null hypothesis (H_0) is rejected. The proposed hypothesis (H_A), which claims that there is significant relationship

between academic computing support activities and primary activities, is therefore accepted.

Table 3: Correlation between academic computing primary and support activities

Primary Activities: C: Teaching and Learning Using ICT D: Researching Using ICT **Support Activities:** A: ICT Vision, Plan, Policies and Standards B: ICT Infrastructure E: Information Services F: Institutional ICT Support	Relation-ship	N	Correl.	Sig. (2-tailed)
	A–C	70	.691**	.000
	B–C	70	.758**	.000
	E–C	70	.722**	.000
	F–C	70	.667**	.000
	A–D	30	.453*	.012
	B–D	30	.551**	.002
	E–D	30	.671**	.000
	F–D	30	.599**	.000
** Correlation is significant at the 0.01 level. * Correlation is significant at the 0.05 level.				

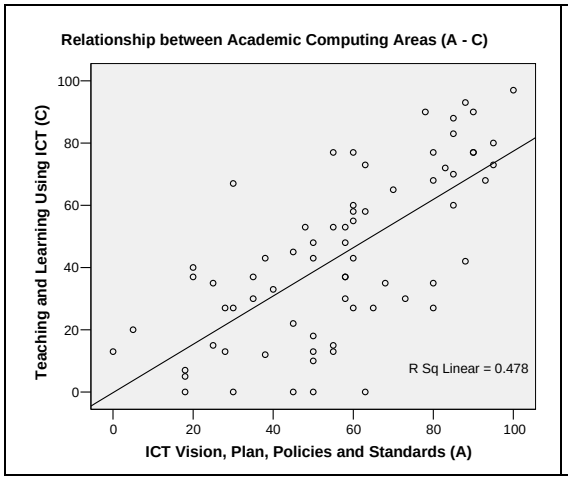


Figure 4(a): A–C relationship

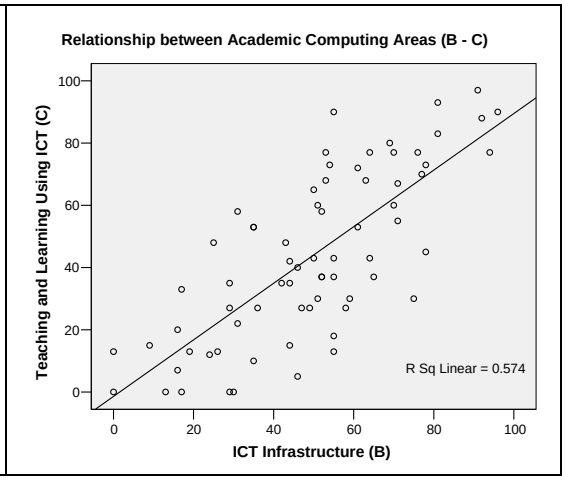
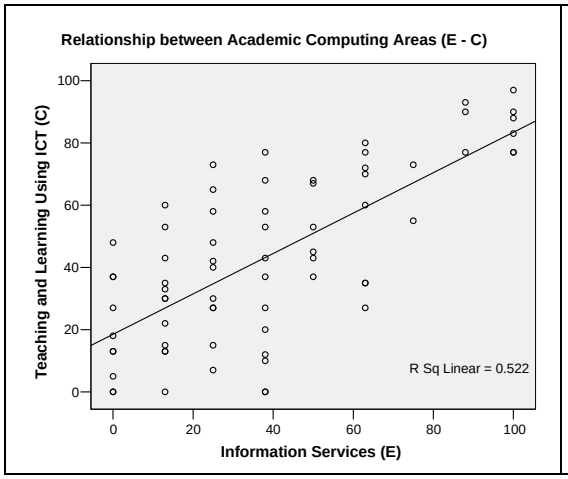


Figure 4(b): B–C relationship



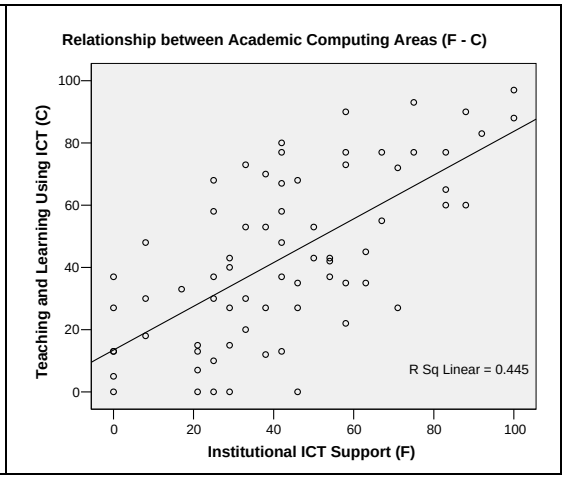
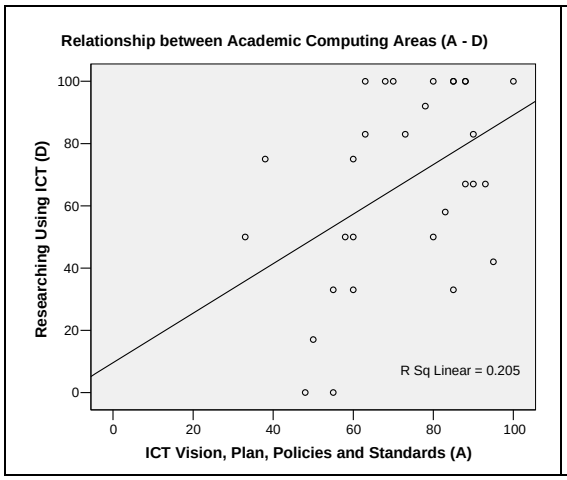


Figure 4(c): E–C relationship

Figure 4(d): F–C relationship



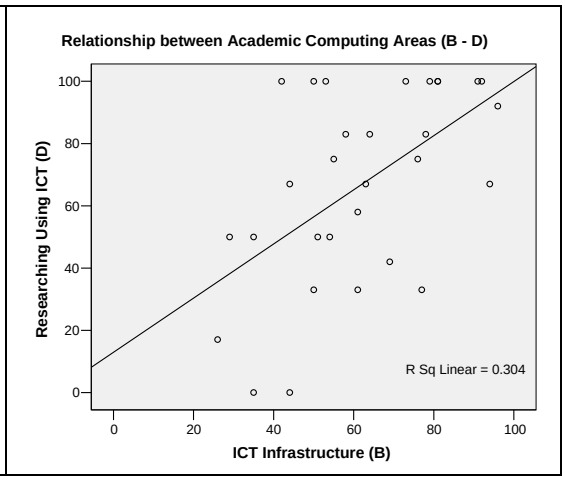
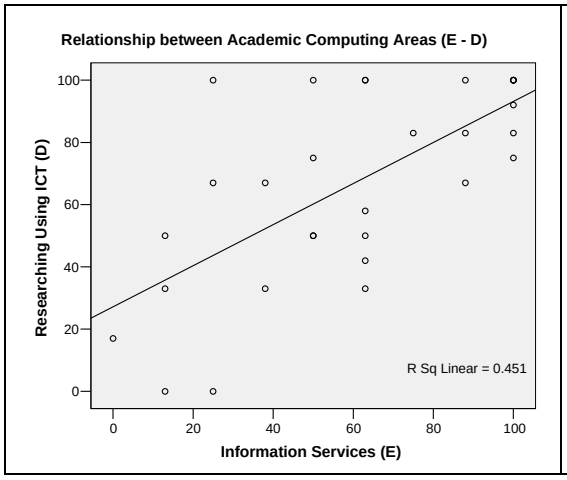


Figure 4(e): A–D relationship

Figure 4(f): B–D relationship



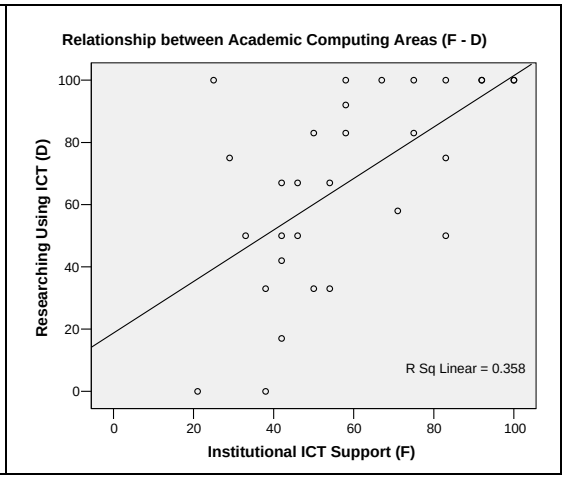


Figure 4(g): E–D relationship

Figure 4(h): F–D relationship

Hypothesis 3

When a primary activity moves horizontally further to the right of the model, value is being added in terms of improved academic computing implementation. In the model, it is more difficult to add value when the chain is horizontally further to the right as the chain approaches a very high level of implementation. The null hypothesis (H_0) and alternative hypothesis (H_A) are represented by the following statements.

H_0: There is no significant reduction of value as the primary activity moves horizontally to the right of the model.

H_A: There is significant reduction of value as the primary activity moves horizontally to the right of the model.

The research identifies two sets of horizontal movement across the primary activities. The first is the C–D horizontal movement across academic computing areas and the second is the C1–C2–C3 (C1–C2 and C2–C3) horizontal movement within Teaching and Learning Using ICT (C) (see Table 4). Bivariate correlation analysis yields Pearson correlation coefficients ranging from 0.599 (C2–C3) to 0.659 (C1–C2). Scatter charts of C–D, C1–C2 and C2–C3 relationships all show clustering of points along respective regression lines, as shown in Figure 5(a), 6(a) and 7(a) respectively.

To test for significance of differences between means, a comparison of means is calculated using one-way ANOVA. For the C–D horizontal movement, institutions not active in research are included in the sample and given the score equivalent to low implementation in Researching Using ICT (D). This is to eliminate bias caused by the high degree of overlapping between institutions actively involved in academic research with institutions with high level of implementation in Teaching and Learning Using ICT (C). Figure 5(b), 6(b) and 7(b) show the large differences between means with negative value of contrast for the C–D, C1–C2 and C2–C3 relationships. In other words, the mean scores are lower as the chain is horizontally further to the right.

The differences between means for the three relationship items are significant at the 0.01 level, exceeding the minimum 0.05 level required to reject the null hypothesis. As a result, the null hypothesis (H_0) is rejected. The proposed hypothesis (H_A), which claims that there is significant reduction of value as the primary activity moves horizontally to the right of the model, is therefore accepted.

Table 4: Comparison of means in horizontal movement activities

C: Teaching and Learning Using ICT C1: Using ICT in Traditional Learning Environment C2: Using ICT in Blended/Virtual Learning Environment C3: Student Assessment Using ICT			**D: Researching Using ICT**	
Relationship	N	Correlation	Value of contrast	Sig. (2 tailed)
C–D	70	.622**	-19.7	.000**
C1–C2	70	.659**	-21.3	.000**
C2–C3	70	.599**	-26.0	.000**
** Correlation/mean difference between full and partial correlation is significant at the 0.01 level.				

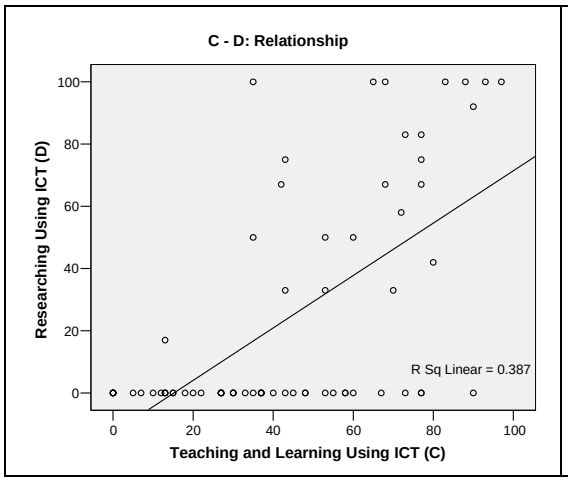


Figure 5(a): C–D relationship

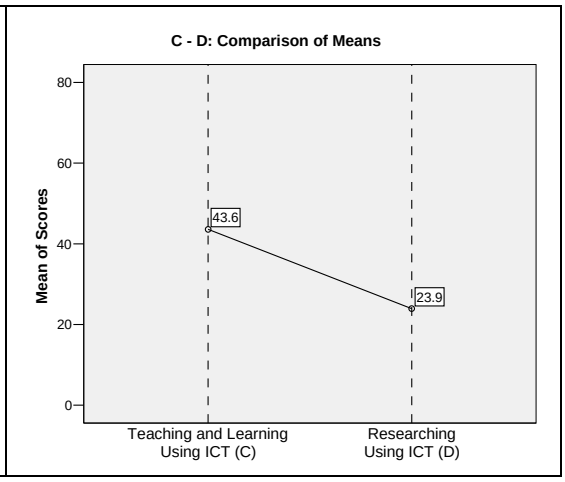


Figure 5(b): C–D comparison of means

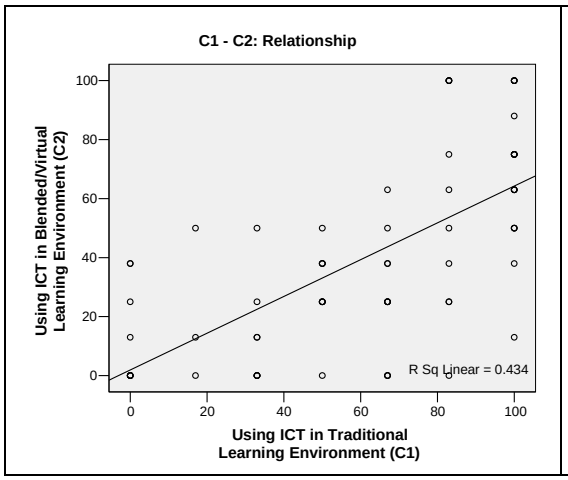


Figure 6(a): C1–C2 relationship

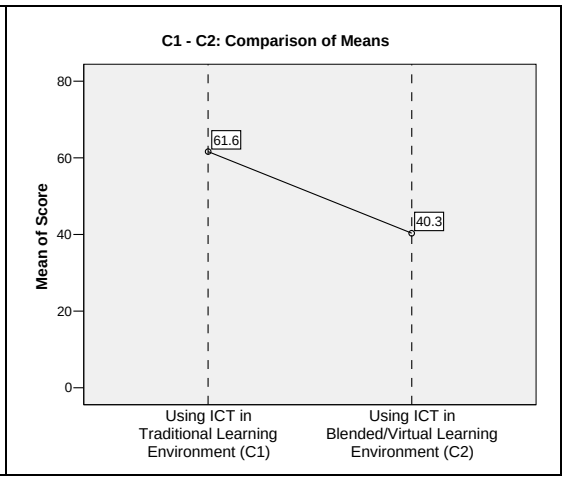


Figure 6(b): C1–C2 comparison of means

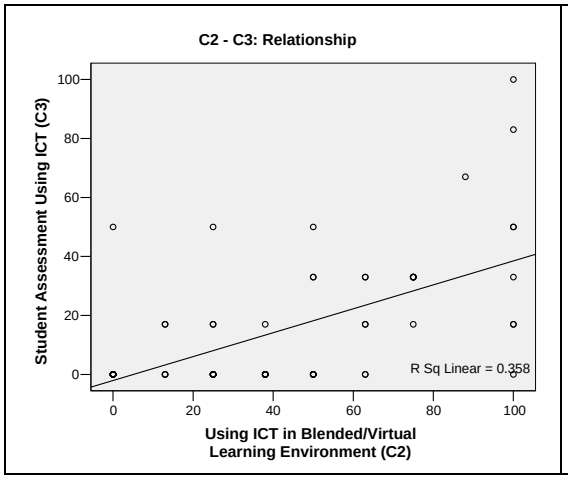


Figure 7(a): C2–C3 relationship

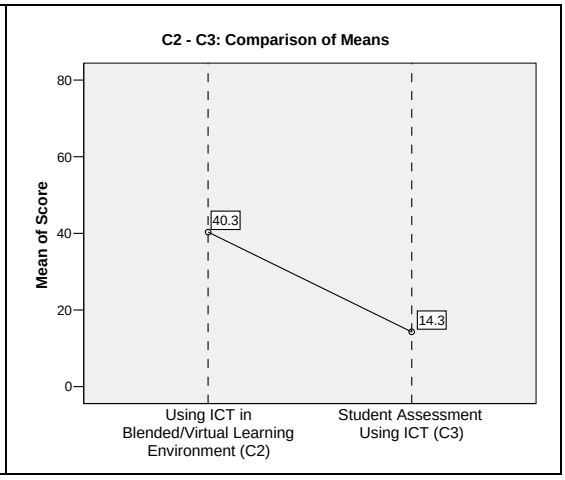


Figure 7(b): C2–C3 comparison of means

Hypothesis 4

The implementation of one value activity may significantly increase another value activity. Implementing one value activity while neglecting another may result in ineffective or inefficient academic computing implementation. The null hypothesis (H_0) and alternative hypothesis (H_A) are represented by the following statements.

H_0: There is no significant reduction of value in the relationship between primary activities if an activity is omitted from the academic computing value chain.
H_A: There is significant reduction of value in the relationship between primary activities if an activity is omitted from the academic computing value chain.

The research identifies fifteen relationship items that represent the relationship between primary activities in Teaching and Learning Using ICT (C) and forty-five in Researching Using ICT (D). Bivariate correlation analysis yields (full) Pearson correlation coefficients for all relationship items. To calculate the strength of the relationship items without the effects of each other activity in the same academic computing area, partial correlation analysis is performed with individual activities as control variables (see Table 5 and Table 6). Comparison between full and partial correlation shows that partial correlation coefficients are lower for all relationship items. This can be clearly seen from the line charts in Figure 8 and 9.

To test for significance, a comparison of means between full and partial correlation coefficients is calculated using one-way ANOVA. The result shows that the differences between means of full and partial correlations are significant at the 0.01 or 0.05 levels for nine out of ten activities in Teaching and Learning Using ICT (C) and four out of six activities in Researching Using ICT (D). The level of significance involving the control variables C33, D11 and D12 are 0.163, 0.138 and 0.190, slightly lower than the minimum 0.05 level required to reject the null hypothesis. Due to fact that most control variables conform to the required level of significance while few control variables that fail to conform still show negative differences, the null hypothesis (H_0) is rejected. The proposed hypothesis (H_A), which claims that there is significant reduction of value in the relationship between primary activities if any activity is omitted from the academic computing value chain, is therefore accepted.

Table 5: Full and partial correlation in Teaching and Learning Using ICT (C)

Teaching and Learning Using ICT (C)		
Using ICT in Traditional Learning (C1): C11: Using ICT as a source of information and in preparing lesson plans and teaching material C12: Using ICT to support learning C13: Using ICT in a role	**Using ICT in Blended/Virtual Learning (C2):** C14: Using ICT in parallel with traditional learning C15: Using ICT to enable flexible learning C21: Using ICT as a means of academic related communication/discussion between students and lecturers	**Student Assessment Using ICT (C3):** C31: Online submission of work C32: E-portfolio/e-presentation C33: Online test/examination

similar to traditional classroom tool		C22: Using ICT as a means of academic related communication/discussion between lecturers									
Relation-ship	Full Correl	Partial Correlation (Omitting Control Variable)									
		C11	C12	C13	C14	C15	C21	C22	C31	C32	C33
C11–C12	.670	-	-	.495	.547	.615	.620	.583	.631	.623	.655
C11–C13	.578	-	.297	-	.381	.493	.500	.467	.515	.494	.561
C11–C14	.496	-	.203	.178	-	.347	.387	.346	.403	.369	.459
C11–C15	.392	-	.211	.194	.115	-	.259	.265	.228	.277	.323
C11–C21	.345	-	.126	.089	.079	.169	-	.106	.211	.206	.296
C11–C22	.421	-	.119	.183	.199	.310	.277	-	.316	.289	.404
C11–C31	.377	-	.250	.231	.218	.198	.264	.249	-	.193	.291
C11–C32	.426	-	.302	.267	.250	.327	.332	.297	.285	-	.371
C11–C33	.283	-	.216	.229	.191	.162	.217	.253	.135	.176	-
C12–C13	.600	.350	-	-	.370	.525	.571	.459	.554	.544	.586
C12–C14	.553	.342	-	.254	-	.444	.437	.372	.494	.481	.532
C12–C15	.368	.154	-	.152	.026	-	.203	.200	.249	.282	.328
C12–C21	.386	.222	-	.134	.094	.237	-	.083	.294	.295	.357
C12–C22	.515	.346	-	.307	.297	.429	.377	-	.451	.440	.504
C12–C31	.299	.068	-	.121	.093	.111	.151	.115	-	.159	.245
C12–C32	.319	.050	-	.115	.078	.210	.191	.122	.196	-	.280
C12–C33	.187	-.004	-	.107	.062	.059	.101	.140	.059	.098	-

Table 5: Full and partial correlation in Teaching and Learning Using ICT (C) (continued)

Teaching and Learning Using ICT (C)											
Using ICT in Traditional Learning (C1): C11: Using ICT as a source of information and in preparing lesson plans and teaching material C12: Using ICT to support learning C13: Using ICT in a role similar to traditional classroom tool					**Using ICT in Hybrid/Virtual Learning (C2):** C14: Using ICT in parallel with traditional learning C15: Using ICT to enable flexible learning C21: Using ICT as a means of academic related communication/discussion between students and lecturers C22: Using ICT as a means of academic related communication/discussion between lecturers			**Student Assessment Using ICT (C3):** C31: Online submission of work C32: E-portfolio/e-presentation C33: Online test/examination		
Relation-ship	Full Correl	Partial Correlation (Omitting Control Variable)									
		C11	C12	C13	C14	C15	C21	C22	C31	C32	C33
C13–C14	.671	.543	.510	-	-	.570	.546	.543	.618	.600	.659
C13–C15	.431	.273	.283	-	.008	-	.225	.284	.300	.333	.402
C13–C21	.488	.376	.347	-	.159	.333	-	.246	.395	.390	.466
C13–C22	.505	.354	.286	-	.210	.398	.286	-	.425	.404	.494
C13–C31	.347	.171	.220	-	.103	.130	.162	.180	-	.176	.307
C13–C32	.391	.196	.263	-	.111	.273	.239	.219	.257	-	.361
C13–C33	.171	.010	.075	-	.008	.015	.059	.123	.016	.057	-
C14–C15	.636	.552	.558	.518	-	-	.466	.537	.534	.561	.605
C14–C21	.583	.506	.481	.396	-	.364	-	.351	.488	.484	.556
C14–C22	.560	.446	.386	.346	-	.424	.297	-	.472	.446	.550
C14–C31	.413	.281	.312	.259	-	.065	.206	.245	-	.212	.349
C14–C32	.474	.334	.377	.310	-	.328	.316	.307	.327	-	.432
C14–C33	.247	.128	.175	.181	-	.018	.129	.211	.072	.120	-
C15–C21	.548	.478	.473	.429	.282	-	-	.405	.391	.465	.507
C15–	.412	.296	.279	.249	.087	-	.092	-	.235	.297	.394

C22											
C15–C31	.586	.514	.536	.515	.459	-	.452	.502	-	.490	.505
C15–C32	.377	.252	.294	.251	.111	-	.198	.240	.088	-	.297
C15–C33	.368	.291	.327	.331	.282	-	.286	.347	.140	.285	-
C21–C22	.644	.586	.563	.528	.472	.549	-	-	.565	.567	.637
C21–C31	.454	.372	.384	.347	.287	.196	-	.274	-	.301	.394
C21–C32	.412	.311	.330	.275	.189	.265	-	.189	.222	-	.363
C21–C33	.249	.168	.195	.193	.134	.061	-	.217	.054	.141	-
C22–C31	.406	.295	.308	.285	.232	.224	.168	-	-	.225	.393
C22–C32	.437	.314	.336	.302	.235	.334	.247	-	.283	-	.421
C22–C33	.131	.014	.041	.052	-.009	-.024	-.040	-	-.066	-.005	-
C31–C32	.541	.453	.492	.469	.430	.426	.436	.442	-	-	.472
C31–C33	.455	.392	.426	.428	.400	.318	.397	.444	-	.360	-
C32–C33	.310	.218	.268	.268	.226	.198	.235	.283	.085	-	-
Sig (2-tailed).		**.000****	**.000****	**.000****	**.000****	**.000****	**.000****	**.000****	**.001****	**.004****	**.163**
Correlation/mean difference between full-partial correlation is significant at the **0.01 level or *0.05 level.											

Table 6: Full and partial correlation in Researching Using ICT (D)

Researching Using ICT (D)							
D11: Using Internet and online resources as source of research information D12: Using ICT as a means to collect research data D13: Using ICT to process and analyse research data D21: Using ICT to manage and document research projects D22: Using ICT to communicate and collaborate between research project members D23: Using ICT to share, disseminate and publish research information/findings							
Relationship	Full Correl	Partial Correlation (Omitting Control Variable)					
		D11	D12	D13	D21	D22	D23
D11–D12	.462**	-	-	.205	.284	.348	.229
D11–D13	.707**	-	.626	-	.574	.637	.579
D11–D21	.505**	-	.360	-.026	-	.377	.149
D11–D22	.419**	-	.281	-.142	-.224	-	.054
D11–D23	.513**	-	.335	.140	.180	.330	-
D12–D13	.472**	.232	-	-	.189	.280	.170
D12–D21	.492**	.338	-	.244	-	.340	-.037
D12–D22	.416**	.276	-	.138	-.188	-	-.063
D12–D23	.592**	.467	-	.434	.380	.467	-
D13–D21	.732**	.614	.651	-	-	.319	.504
D13–D22	.695**	.621	.622	-	.000	-	.444
D13–D23	.615**	.416	.472	-	-.034	.189	-
D21–D23	.857**	.807	.806	.757	-	.670	-
D22–D23	.758**	.697	.698	.583	-.344	-	-
D24–D22	.949**	.942[X]	.941[X]	.900	-	-	.892
Sig (2 tail) mean diff.		**.138**	**.190**	**.039***	**.000****	**.006****	**.019***
Correlation/mean difference between full-partial correlation is significant							

at the **0.01 level or *0.05 level. X Outlier

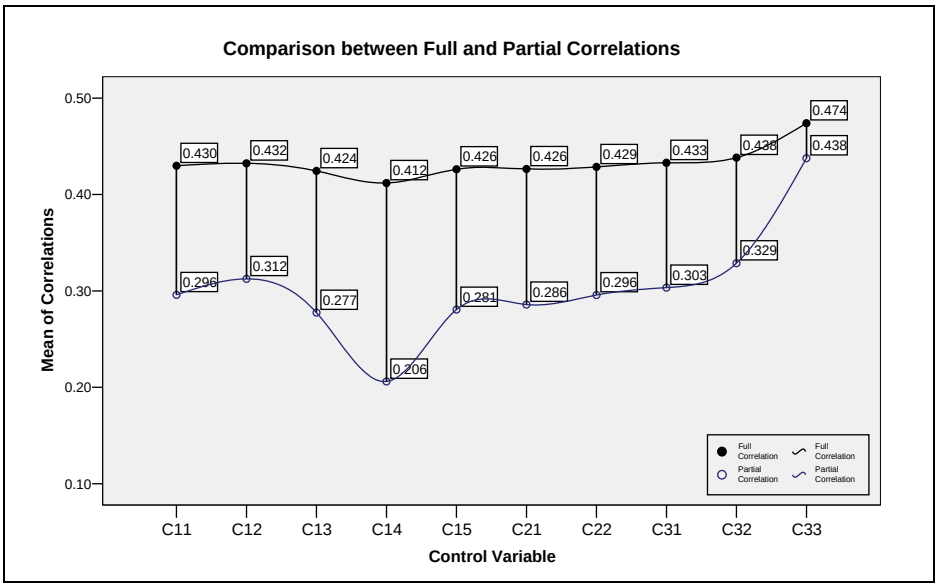


Figure 8: Comparison between full and partial correlations in Teaching and Learning Using ICT (C)

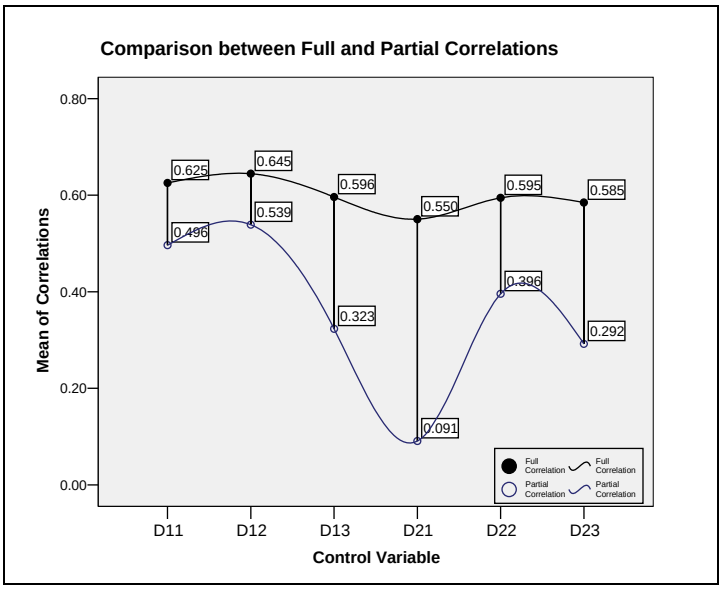


Figure 9: Comparison between full and partial correlations in Researching Using ICT (D)

Hypothesis 5

The implementation of one value activity may significantly increase another value activity. Implementing one value activity while neglecting another will result in

ineffective or inefficient academic computing implementation. The null hypothesis (H_0) and alternative hypothesis (H_A) are represented by the following statements.

H_0: There is no significant reduction of value in the relationship between support activities and primary activities if a support activity is omitted from the academic computing value chain.

H_A: There is significant reduction of value in the relationship between support activities and primary activities if a support activity is omitted from the academic computing value chain.

The research identifies eight relationship items that represent the relationship between academic computing support activities and primary activities. The relationship items are labelled A–C, B–C, E–C, F–C, A–D, B–D, E–D and F–D. Bivariate correlation analysis yields (full) Pearson correlation coefficients for all relationship items. To calculate the strength of the eight relationship items without the effects of each individual support activity, partial correlation analysis is performed with the support activities as control variables (see Table 7). Comparison between full and partial correlation shows that partial correlation coefficients are lower for all relationship items. This can be clearly seen from the line chart in Figure 10.

To test for significance, a comparison of means between full and partial correlation coefficients is calculated using one-way ANOVA. The result shows that the differences between means of full and partial correlations are significant at the 0.01 or 0.05 levels, conforming to the minimum 0.05 level required to reject the null hypothesis. As a result, the null hypothesis (H_0) is rejected. The proposed hypothesis (H_A), which claims that there is significant reduction of value in the relationship between support activities and primary activities if a support activity is omitted from the academic computing value chain, is therefore accepted.

Table 7: Full and partial correlation between primary and support activities

Relation -ship	N	Full Correl.	Partial Correlation (Omitting Control Variable)			
			A	B	E	F
A–C	70	.691	-	.430	.485	.506
B–C	70	.758	.579	-	.541	.615
E–C	70	.722	.548	.454	-	.507
F–C	70	.667	.457	.434	.370	-
A–D	30	.453	-	.235	.153	.286
B–D	30	.551	.416	-	.070	.355
E–D	30	.671	.571	.464	-	.535
F–D	30	.599	.509	.441	.407	-
Sig. (2 tail) mean difference			**.005****	**.002****	**.010****	**.030***
Correlation/mean difference between full-partial correlation is significant at the **0.01 level or *0.05 level.						

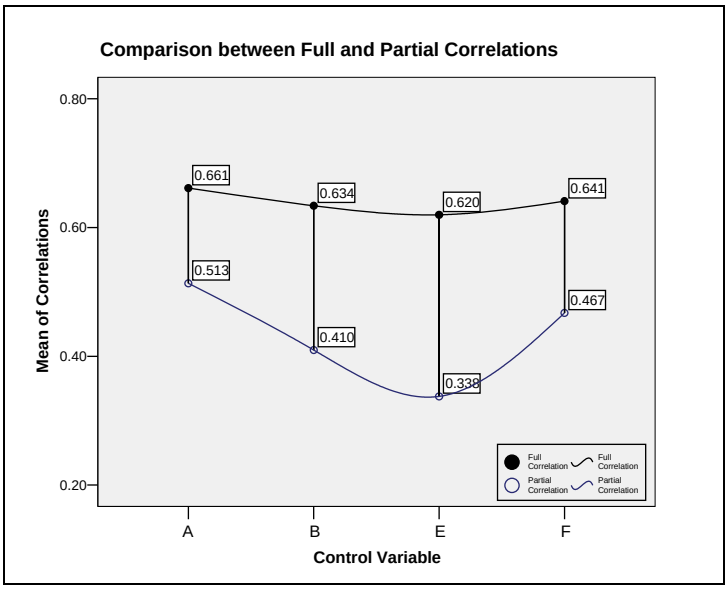


Figure 10: Comparison between full and partial correlations between primary and support activities

Summary and Conclusion

This paper describes the testing of hypotheses related to the value chain relationships between academic computing areas and components in the framework. The paper began by explaining the relationships of the academic computing value chain model. To generalise the value chain model to all higher education institutions in Malaysia, the paper briefly described the data collection process based on the nationwide academic computing survey. The paper then proposed a weighting scheme for deriving the composite value of academic computing areas and components. Finally, the paper detailed out the actual testing of hypotheses using bivariate correlation analysis, partial correlation techniques and the comparison of means using ANOVA.

The conceptualisation the academic computing value chain model using qualitative methods that was first proposed by Mokhtar *et al.* (2006) has been successfully proven using quantitative methods in this paper. As a conclusion, the academic computing value chain relationships are summarised by the following statements.

H1. There is significant relationship between the two academic computing primary activities.

H2. There is significant relationship between academic computing support activities and primary activities.

H3. There is significant reduction of value as the primary activity moves horizontally to the right of the model.

H4. There is significant reduction of value in the relationship between primary activities if an activity is omitted from the academic computing value chain.

H5. There is significant reduction of value in the relationship between support activities and primary activities if a support activity is omitted from the academic computing value chain.

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Beyond Quality – towards Kinetics and Blue Ocean Management in Higher Education

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Abstract

Quality Management Systems in Higher Education institutions around the world are now increasingly becoming commonplace. The move from standard-based audits, using say the ISO 9000 series of standards, to fitness-for-use-based audits is beginning to take place in a number of countries. Some countries that started somewhat later than others, may still be conducting standard-based audits but they too are rapidly re-tooling and re-arranging their SOPs to move towards fitness-for-use-based audits. This paper reports on a number of investigations of management development generally and the potential application of the latest management philosophies to higher education specifically. The latter includes Kinetics Organization and the Blue Ocean Strategy.

This paper shows that higher education institutions are lagging behind industries in applying new management philosophies. This results in poor alignment between graduates' skills and industry requirements. Given the very rapid and pervasive expansion and application of technology, it is inevitable that higher education institutions seriously consider the adoption and adaptation of these new management philosophies. After all, the human capital of a country is pivotal to prosperity and economic survival of the country and the business of higher education institutions is indeed to provide relevant, up-to-date skilled and knowledgeable human capital.

The paper concludes with recommendations on applying these management philosophies to the various aspects of higher education and higher education institutions.

♣ This paper is reproduced here from the Proceedings of the SEAAIR 7th Annual Conference held in Bangkok in September 2007, as it is considered to be a seminal paper that may extend the management of higher education to a higher level.

Introduction

Management or organizational development theories had continually grown in numbers to the extent that laypeople are easily confused as to the efficacies of the various exhortations by management and organizational experts. Many books and articles have been written by management academics as well as ex-practitioner CEOs [Covey, 1990; Welch, 2005; to mention just a couple]. Each of these theories is normally accompanied by a series of supporting evidence that would appear formidable until another theory again accompanied by equally formidable supporting evidence supersedes it. A classic case is the highly acclaimed book by Waterman and Peters entitled *In Search of Excellence* published in 1983 in which 48 US companies were discussed and considered to be excellent by the authors based on a number of criteria. Some nine years later more than half of these excellent companies had either disappeared or relegated to a much lesser status.

One could conclude, true to the adage oftentimes cited by quality practitioners, that the only constant is in fact change. Excellence therefore is very much subject to temporal variations and is indeed ephemeral at best. This of course led to the birth of *Continuous Improvement* as strongly recommended by Quality Gurus such as Deming [1986], Juran & Gyrna[1980] and Crosby [1979, 1992]. Deming in fact produced the famous PDCA cycle to help implement continuous improvement in any scenarios.

Much of the development in management had been quietly observed by higher education managers [Barnett,1992; Green,1994; Idrus, 1999, 2000,2004; Idrus et al 2000] in order to improve the efficiency and effectiveness of higher education particularly in the face of its massification and thus increasing involvement of the private sector in higher education. The increasing demand for and expectations of higher education quality commensurate with its costs normally borne by parents and those who provide resources, had surreptitiously put “Quality” as the *de facto* higher education management choice number one.

No literature appears to be available that deliberately and specifically studies and traces the genesis of the conscious use of quality management in higher education. Nevertheless up to date, it appears that in the eyes of many higher education managers and researchers, quality has provided a satisfactory measure in order to sustain support for higher education’s longevity.

Various government, semi-government and non-government agencies have been established to monitor higher education institution managements that they provide quality service in all respects to the paying students. In UK it is the Quality Assurance Agency (QAA), in Australia the Australian University Quality Agency (AUQA), in New Zealand the New Zealand Qualifications Authority (NZQA), in Indonesia *Badan Akreditasi Nasional – Perguruan Tinggi (BAN-PT)* the National Accreditation Board for Higher Education, in Thailand the Office of the National Education Standards and Quality Assurance (ONESQA) and in Malaysia the Malaysian Qualifications Agency (MQA).

The scopes and mandates of these various national agencies also vary from country to country with AUQA for example leading the pack on *fitness for purpose* audits rather than

standards-based audits which are still being practised by BAN-PT of Indonesia and LAN the predecessor of MQA in Malaysia. Malaysia is rapidly revising its higher education quality policies and may introduce *self-accreditation* by Malaysian private universities. Such a move will bring Malaysia *on par* with many developed countries in this respect.

Many higher education institutions in Malaysia sought and obtained ISO 9001:2000 certification. INTI-UC for example is ISO9001:2000 certified and had recently successfully obtained re-certification for the next three years. Involvement with such standards exposes the higher education managers to the practice of quality in industry and heightens awareness of the required documentation system in order to ensure quality of all aspects of the institution's, so that it could itself promote and practise quality.

The huge investments by governments and the private sector alike on quality in higher education, somehow precludes and prevents everyone involved in the management of higher education to seek better and improved management system.

Higher education institutions could be accused rightly or wrongly of harbouring quality as their management philosophy rather than looking for better management practice that would improve teaching, learning, research, because the higher education system in particular and education system in general continue to practise a version of quality management that has well passed its *Use By* date and is rarely used in industry anymore. This is the practice of Quality Control system which very closely resembles the education and higher education systems.

A brief review of quality and its traditional systems are discussed in the next section.

Quality, QC, QA and CI

ISO 9001:2000 standard defines Quality as *fitness for purpose* meaning that quality is achieved when the product or service meets the requirements of its intended use. Generally it *fits the purpose*s it is meant to provide the customers.

QC which is the abbreviation for Quality Control is defined as a system which involves an input, a process, and the output but also an inspection stage by which the acceptable products are separated from those that fail to meet the specifications. Diagrammatically the QC system is shown in Figure 1.

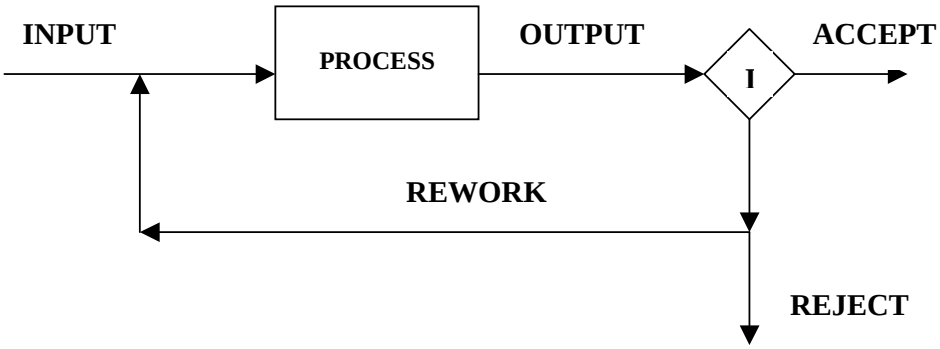


Figure 1 – Quality Control showing the pivotal role of Inspection "I"

As far back as 1921 Shewhart (Shewhart, 1921) devised a number of exquisite statistical methods to legitimize the extension of samples analysis to the real manufactured population.

However, even the sophisticated sampling theories and practices could not stop bad products reaching the customers. This *customer's risk* could obviously jeopardize the prestige and reputation of the company *vis a vis* its product quality. On the other hand, where samples analyses lead to the rejection of a whole batch of products, the *producer's risk* in this case refers to the existence of good products in the rejected batch. This situation then prevents the company to sell good products.

The focus of QC is on separating good products from bad. The practice of QC is therefore wasteful, firstly due to the existence of both customer's and producer's risks and secondly from the fact that the products are made first before separating the good from the bad amongst them. Those products which are rejected have therefore consumed all the necessary energy, effort, money and other resources that good products consumed, but are not able to be sold. At best these rejects may still gain some returns by being sold as "seconds" and/or "rejects" but of course not at the same price as the good products.

Even a casual look at Figure 1 above shows a close resemblance to the educational system, where the Inspection "I" in QC is the Final Examination of a course in the education system.

While the disadvantages of the QC system in manufacturing are self-evident, those in higher education are not, for examinations are part and parcel of the education theory and practice. Otherwise how else could teachers be confident of the learning derived by the students?

As examinations are to test what the students had learnt from what the teachers had given during the process of teaching and learning, they inevitably test not what the students had understood but what they had remembered. This is very much the debilitating idiosyncrasy of examinations, but is difficult to let go as its disappearance may signal a lack of quality in the course or program.

What is also interesting about the above analysis is that when applied to education in Asia, the QC mentality of its education system mutually reinforces the *Acceptance* value of the Asians. Respect for the elders, for their teachers, professors, those respected in the eyes of the people, is the *Asian* value that had hindered students' ability to engage the teachers and consequently the students' ability to reconceptualize. Plotted in two dimensions, this relationship is shown in Figure 2.

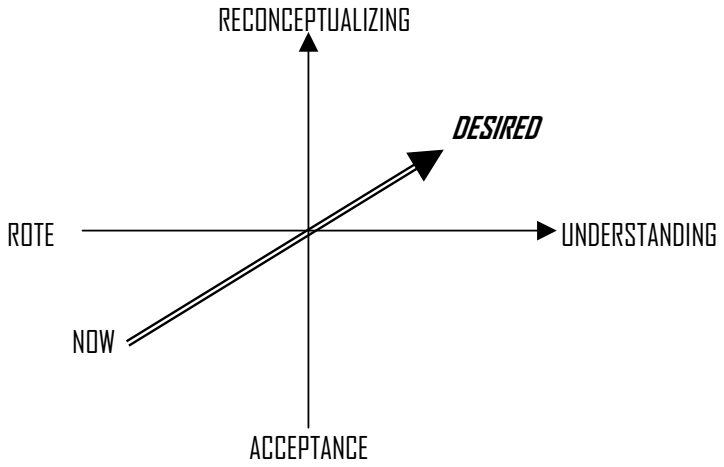


Figure 2 – The essence and description of Transformative Learning

As a result, the learning is by rote, defined as repetition without understanding, and by unquestioned acceptance which precludes the important learning exercise of re-expressing the concepts learnt on one's own. In Figure 2, this would be shown as the area in the lower left hand quadrant, when in fact the post-industrialized world demands from everyone in any organization an innate ability to understand, which leads to the ability to reconceptualize. We therefore need to move from the lower left hand quadrant in Figure 2, to the top right hand quadrant, in order to not only bring the Asian educated masses on par with their peers in the developed world, but also to ensure sustained development of all aspects of life in Asia generally.

In order to do so, the QC mind-set will also need to be replaced. As one of the Gurus in Quality had said that we must move away from the mentality of inspection (Deming, 1986). That basically means that we have to move away from QC. We must start moving ourselves to continually improving the *process*, because by so doing we assure the quality of the products. This amounts to moving towards QA.

QA is defined as the system that ascertains the meeting of all specifications by the products without the need for any inspection of the products. In higher education there was a lot of resistance to the idea evidenced by the lack of its implementation. It would appear that academics are not comfortable with the idea that courses do not need to be assessed through an Examination Paper even though there is an increasing number of courses which are assessed totally through course work alone. There is also no evidence of reduced quality of such courses. It is in fact simply an evolution in how the learning is assessed rather than diluting the learning or education in general.

The above resistance has been rationalized by many in Asia in particular, by saying that there is a lot of plagiarism and copying going on amongst students, that Asian students are not really after the learning or the education, but simply wanted the piece of paper at the end of the program.

This sounds like an indictment of the Asians in general, although it is in fact an indictment of the Asian teachers, lecturers and professors, for with a little hard-work in the part of

these teachers, lecturers and professors, the copying and plagiarism that the students are accused of, can be significantly reduced if not eliminated.

It has been found that plagiarism in Asia is not confined to students only. However, these must not hinder progress in education generally and higher education in particular. Action must be pervasively applied to perpetrators of this crime by both academicians and law enforcers. The lack of regulations and in many cases enforcement against these people had indeed retarded progress in education in Asia generally.

The third major hindrance to progress in education in Asia is the lack of commitment to *Continuous Improvement* (CI), when CI has been proven to be pivotal to winning competition, to improving the quality of life, to improving education, to improving the quality of graduates that higher education institutions produce and hence to improving the quality of the country's human capital as a whole.

Deming's (Deming, 1986) PDCA (Plan Do Check and Act) cycle has been shown to be an imperative in organizational survival in this rapidly changing world where customers' expectations are continually raised by the ever increasing quality level provided by products and services and where customers do have the means and wherewithal to pick and choose.

Again, the educational sector in general had not been able to see and apply the PDCA cycle to its advantage, to the extent that it is not uncommon that industries are indeed well ahead of the educational institutions which are supposed to provide the human capital for these organizations.

Organizational Development in industry – a brief review

If we take the Industrial Revolution as the starting point for modern organizational development, then we have some 157 years of development in industries. If we consider higher education development, we would find that in fact the first university was set up over two hundred years before the Industrial Revolution. And yet, as mentioned in the previous paragraph, higher education has been left behind by industries, for reasons that have already been discussed above. The resistance to change in higher education generally adds to this gap.

Figure 3 summarizes one possible development in industry since the Industrial Revolution. The Six Million Dollar question is, where is education in this scenario?

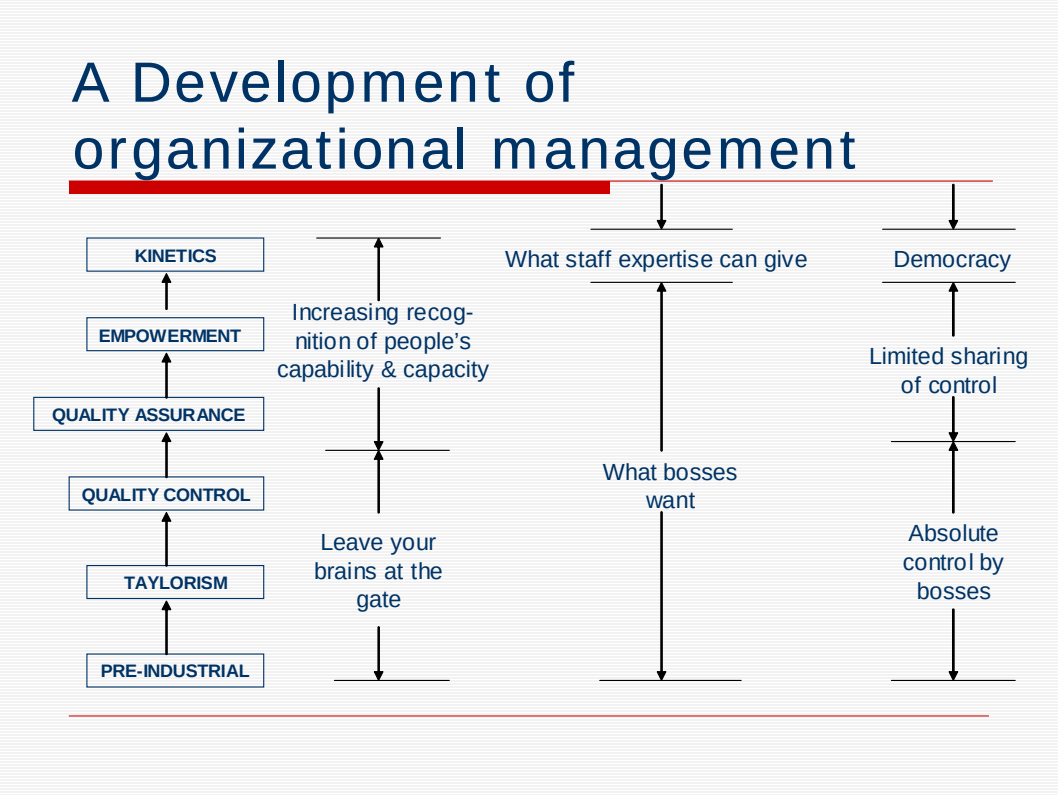
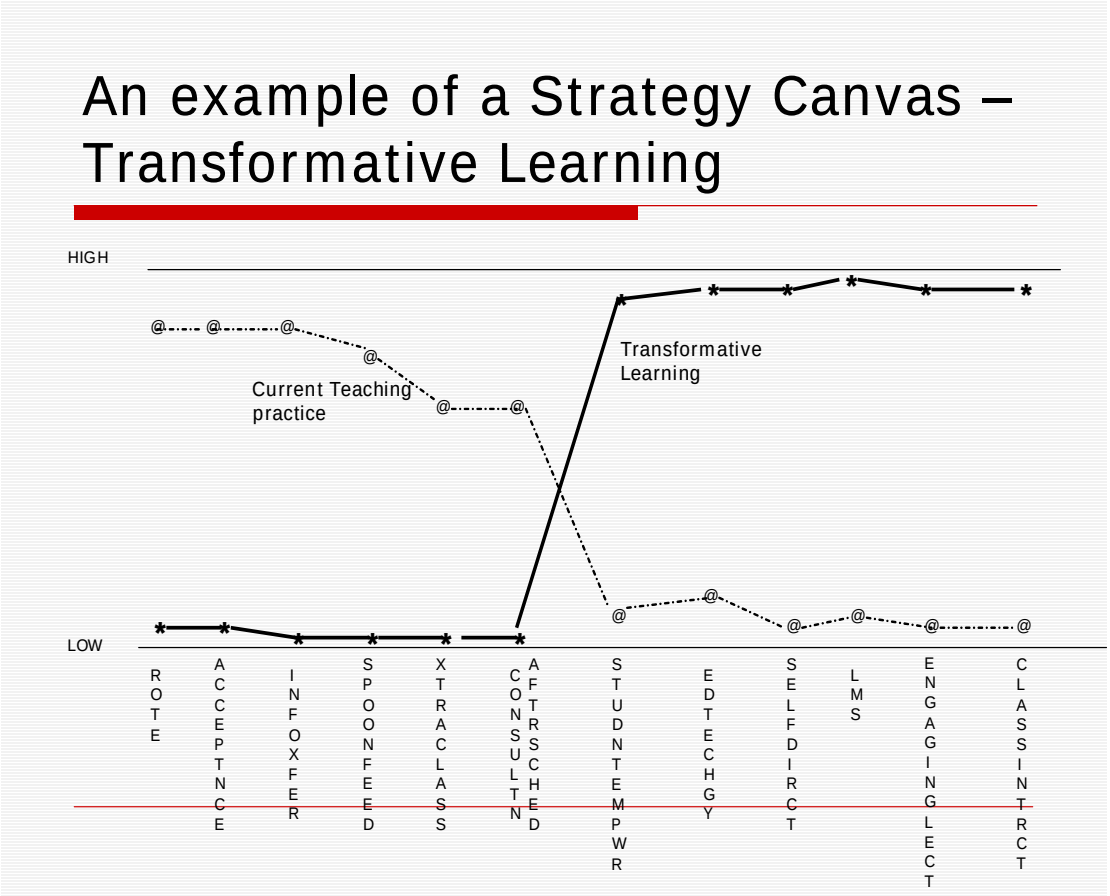


Figure 3 – A summary of organizational development in industries (also showing the related practices in the range of managements)

With the publication of the book *Blue Ocean Strategy* by Chan Kim and R Mauborgne (WC Kim & Mauborgne, 2005) recently, many organizations are already considering the strategic approach discussed in the book.

Blue Ocean Strategy management could therefore be included in Figure 3 to sit on top of Kinetics management. Indeed Kinetics management and Blue Ocean Strategy management appear to dovetail each other well. While Kinetics management underscores the need to look at the forces that create changes (in preparing organizations for the unpredictable world), the Blue Ocean Strategy management emphasizes strategy differentiation (in contrast to *product differentiation*) to make competition obsolete. Figure 4 shows an example in higher education, where *Transformative Learning* is a potent candidate for Blue Ocean Strategy management for it is not only a different look at how teaching and learning to be organized in Asia, but that it is indeed directly opposite to current practices of teaching and learning that have been proven to disadvantage our graduates.



ROTE= rote learning, repetitions without understanding; ACCEPTANCE = mentality of acceptance without question and thus precluding reconceptualization; CONSULTN AFTRSCHED= student consultation with lecturers outside time-table; STUDNTEMPWR= student empowerment; EDTECHGY= the use of educational technology; SELFDIRCT= self-directed learning; LMS= learning management system; ENGAGINGLECT= interactive engagement of lecturers by students leading to reconceptualization; CLASSINTRCT= class interaction between students and lecturers and between students and students

Figure 4 – An example of using Blue Ocean Strategy in Higher Education (the application of Transformative Learning)

As discussed earlier and referring to Figure 3, higher education is still shackled in the QC era and is some 4 management levels behind industries.

Discussion

Clearly, further reforms in education generally and higher education in particular will need to happen if the expected roles of higher education are to be maintained *vis a vis* industries. There are many management developments that higher education must keep itself abreast with, but little if any of these has been adopted and/or adapted by the higher education industry, to its own peril.

The rapid obsolescence of knowledge, particularly in areas such as electronics, computer technology and now management, should have been signs enough for higher education to seek recourse to keep itself current.

The concentration of higher education on quality and quality-related management appears to begin to wane and a *replacement* seems necessary, again if we wish to ensure that higher education remains current. We must therefore need to look beyond quality. The management or organizational development in industries summarized in Figure 3 may provide some guidance.

Conclusion

While development in the environment encircling higher education has been vigorous and decidedly resolute, development in higher education management has been sheepish and lagging behind industries.

It is time to look beyond Quality and consider Kinetics and Blue Ocean Strategy management in higher education in all its aspects in order to prop it to leadership position in human capital development.

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Generational Perceptions of Teaching and Learning in Thai Universities

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Abstract

The literature suggests that generations can be subdivided into Seniors (born prior to World War two), Baby Boomers (born 1940-1959), Generation X (1960-1979) and Generation Y (post 1979). Past studies indicate that these generations vary in terms of their defining events from a historical perspective (for instance the seniors landmark event is World War Two whilst Generation X are marked by the Vietnam War), music (Generation X prefer Punk disco and Generation Y Grunge Boy bands), their heroes and so on. But does this variability in characteristics, values and the like impact on tertiary education? The literature search does not indicate much in the way of institutional research within the South East Asian region in this area. This study attempts to bridge this gap or at least contribute to a better understanding of the potential differences, particularly between Generation X and Y in terms of their University experiences regarding learning and teaching and their point of views on working. It is based on a survey of students within the Thai Universities comparing and contrasting student characteristic on the one hand and perceptions of the learning and teaching environment and outcomes on the other. The paper considers some implications of its findings.

INTRODUCTION

Aldridge (2001) defines four generational groups including the Seniors who were born between 1920 and 1939; Baby Boomers born between 1940 and 1959; Generation X born between 1960 and 1979; and Generation Y or the Millennials born after 1979. It must be noted at this point that there does not appear to be complete unanimity regarding the exact definition of the generations. For instance Eisner (2004) defines Generation Y as the group born from 1977 to 1994. However, in the present study, Aldridge (2001) definition will be

used as she is one of the authors dealing with a number of generations rather than just one group, as was the case with Eisner (2004) who focused on Generation Y only.

Aldridge (2001) believes that the four previously mentioned generational groups possess unique life experiences, sociocultural traits, believes and expectations that they bring into the workplace. For instance she suggests that the core values of the seniors include dedication, respect for authority and adherence to rules. However, Baby Boomers exhibit optimism, personal gratification, health and wellness. Generation X is considered to value diversity, balance, fun, and techno-literacy. Generation Y value civic duty, achievement, sociability, informality and being street smart. Similarly the work ethics can and does vary across the generational spectrum. For instance Generation X tend to be impatient, independent, process averse, creative, cynical and favour multi-tasking according to Aldridge (2001). However, Generation Y tend to be determined, people-oriented, optimistic and have a need for supervision and structure. The foregoing whilst raised in terms of the workplace could also impact on the higher education learning and teaching of the two primary groups currently participating in University education, namely, Generations X and Y. This raises a number of issues for higher education, inter alia, as follows:

How do Generation X and Y vary in terms of their demographic and other characteristics within the University environment?
What variation exists regarding the two generations perceptions of their values?
What do these two generations perceive in terms of their higher education learning and teaching environment?
Are the above issues linked in any way to other variables such as gender, level of program and attendance mode?

The above considerations will form the primary focus of the present study. Interestingly the literature search for this study indicates a dearth of institutional research in the abovementioned areas. Nevertheless, some related certain researches as noted below have covered areas but mainly they are tangential to the above-articulated purposes of this study.

Allison (2004) indicates that Generation Y that is known for having access to e-mail, fast food and cell phones, has taken over the American campuses. His definition of Generation Y is similar to Aldridge (2001) with only a difference of one year as Allison defines this generation as being born after 1980. This generation is seen as one that has always experienced technology and is accustomed to applying such technologies to communicate better. This so-called Millennial Generation have had more opportunities to be involved as leaders and in service to the community according to Allison (2004). The Generation Y also wish to know what they are getting for their money and in an environment of user pays in higher education, this can bring about challenges for University marketers.

Campbell and Bruneau (2003) consider effective communication and related issues concerning Generations X and Y. They suggest that Generation X are family orientated, individualists, skeptics, critical of everything, have little sense of loyalty to norms but tremendous loyalty to peer groups, feels the need for excitement, have slightly higher

moral and ethical standards than the general population, feel optimistic about the quality of life, responsible since childhood for adult decisions, hold global perspectives and have minimal expectations in terms of work. In contrast, Campbell and Bruneau (2003) indicate that Generation Y is culturally diverse, their interest is flighty, they are confident and optimistic, respond to humour, are risk tolerant, show confidence in the application of technology, like to stay in communication, very reliant on the group and are realistic regarding their view of the world. Campbell and Bruneau (2003) believe that Generation X and Y share someoverlapping values that influence learning behavior. These can be used to enhance the learning and teaching environment as follows:

They both seek comfort with those who share their own values thus providing opportunity for team assignments. Generation X and Y are indifferent to rules and regulations and perhaps they ought to select or define some aspect of their class assignment. Their goals must be internally generated not externally imposed and so the teacher should discuss issues frankly, asking their students about their opinions and possible solutions.

One of Campbell and Bruneau (2003) conclusion is that further research is required regarding comparative study of Generation X and Y within the Educational environment context but related to countries other than the USA where much of the Generational research has been undertaken. This study hopes to contribute to that knowledge development by presenting the findings of generational institutional research within a South East Asian country, namely, Thailand.

METHODOLOGY

The previously stated objectives of the present research were addressed by designing a survey questionnaire taking into account the relatively meager past generational institutional research. The survey instrument was piloted with several students using the Thai language in order to expedite comprehension of the questions being posed to the university students. It was found that the questionnaire was relatively well understood by the students with only minor adjustments required. Following such changes, the instrument was implemented within various Thai case study Universities by using convenience sampling. They include three Government Universities and four Private Universities; 720 Questionnaires were distributed to the respondents from various universities with 628 completed survey instruments returned to the researchers providing a response rate of 87.22 %. Whilst every effort was made to ensure that both Generations X and Y were adequately represented in the sample, unfortunately, as explained later, due to the predominance of younger students in the Thai University system, the absolute number of Generation X students was relatively smaller than that for Generation Y. As such this research used stratified-sampling technique that is justifiable given the dearth of past research on the topic within a University environment. However, this brings about some limitations that ought to be borne in mind when considering the findings of the study.

The findings of the study are often tabulated to compare the two generations' mean agreement with the various statements included in the questionnaire using the paired

Student t-test for difference of means. The following procedure was used in presenting the comparison of differences of mean agreement between Generation X and Generation Y:

- The table presents the mean agreement and standard deviation for the two generations being compared.
- The calculated t value is provided.
- The probability that the observed difference in mean agreement between the two generations is due to chance alone is provided, with the highlighting of statistically significant results. The latter occurs when the probability is less than 0.05 and one can then conclude with 95% confidence that the observed difference in mean agreement are not purely due to chance.
- The above process was also adopted in examining gender and level of program differences.

GENERATIONAL STUDENT SURVEY RESULTS

Student Demography

Table 1 provides the demographic characteristics of the responding students to the survey. It reveals that 51% of the respondents are females in congruence with the total population of students within the typically Thai Universities that is predominantly female. The overwhelming majority of the students are predominantly drawn from Generation Y, again in keeping with the institutional profile. The main discipline represented in the sample is Business and Administration (52%) with smaller numbers drawn from other disciplines including Humanities and Social Sciences (28%), Sciences (13%) and Engineering (7%); it is noted that Business Faculty has a large proportion of the students' population in many Thai Universities. Most of the students were full-time , drawn from undergraduate programs and entering the institution direct from high schools, again in keeping with the Thai Universities profile. The finding is also typical in terms of the proportion of undergraduate and postgraduate students in many universities in Thailand, namely, that there is the higher proportion of undergraduate students than the postgraduate students. This is due to the relative youth of many of the Thai Universities that initially were predominantly undergraduate universities and later expanded to provide both undergraduate and postgraduate programs. It is also due to the greater proportion of students enrolled in undergraduate programs than those enrolled in postgraduate programs due to the greater selectivity of the latter and partially representing the demographic forces in a developing country such as Thailand. One of the study limitations flowing from these descriptive statistics is that the proportion of Generation X is relatively small (12%), however, unfortunately this is in keeping with the total institutional population of students and hence there was little the researchers could do to change the situation.

Table 1: Demographic Characteristics of Respondents

Characteristic	Frequency	Relative Frequency (%)
Gender		
-Male	305	48.57

Characteristic	Frequency	Relative Frequency (%)
-Female	323	51.43
Generations		
- Y	544	87.18
- X	75	12.12
Discipline		
- Humanities & Soc. Sc.	173	27.68
- Engineering	45	7.20
- Business & Admin.	328	52.48
- Sciences	79	12.64
Characteristic	**Frequency**	**Relative Frequency (%)**
Attendance Mode		
- Full-time	536	85.6
- Part-time	90	14.40
Level of Program		
-Undergraduate	556	88.68
- Postgraduate	71	11.32
Prior Highest Qualification		
-High School	468	77.24
- Diploma	42	6.98
- Bachelor Degree	79	13.12
- Masters Degree	13	2.18

Comparative Statistical Analysis of Generation X and Y

This section presents a comparative analysis of the values and learning and teaching perceptions of Generation X and Y at the Thai Case Study University. Table 2 provides the Thai students identification with certain values and characteristics. With only two exception, the Generation X sustained greater mean scores than Generation Y with the following statistically significant results:

- Generation X (mean agreement= 3.89) more strongly believed that their core values included dedication, respect for authority and adherence to rules than was the case with Generation Y Thai students (3.63, $t=3.49$, $p<0.01$).
- Similarly Generation X (4.11) were more likely to agree that their core values encompassed diversity, balance, fun and techno-literacy than did Generation Y (Mean= 3.78, $t=3.99$, $p<0.01$).
- Generation X (4.40) scored more highly in terms of their optimism, personal gratification, health and wellness than was the case with generation Y (3.90, $t=6.19$, $p<0.01$).
- Similarly generation X (4.07) assigned greater value on civic duty, achievement, sociability, informality and being street smart than generation Y (3.81, $t=3.47$, $p<0.01$).
- Generation Y (3.58) scored lower on being team oriented, sensitive to feedback and self-promotion driven (4.03, $t=5.36$, $p<0.01$).

- Finally Table 2 reveals that generation Y (3.70) on the average scored lower on being determined, people-oriented, optimistic and needing supervision and structure in the workplace than was applicable to generation X (4.04, t=4.20, p<0.01).
- In statistical terms the two groups were likely to share a number of values including they were equally hard working, loyal, will do whatever is asked and favour delayed reward in the workplace; the two groups were equally impatient, independent, creative and cynical and favour multi-tasking.

Table 2: Differences in Generational Student Perceptions of Values

Item	Generation Y		Generation X		t value	Probability
	Mean	S.D.	Mean	S.D.		
Core values of dedication, respect authority & adherence to rules.	3.63	0.71	3.89	0.61	-3.49	0.001
Core values of optimism, personal gratification, health & wellness.	3.90	0.68	4.40	0.52	-6.19	0.000
Core values of diversity, balance, fun & techno-literacy.	3.78	0.66	4.11	0.63	-3.99	0.000
Core values of civic duty, achievement, sociability, informality & street smart.	3.81	0.69	4.07	0.58	-3.47	0.001
Hard working, Loyal & delayed rewards.	3.60	0.70	3.65	0.76	-0.61	0.541
Team-oriented, sensitive to feedback and self-promotion.	3.58	0.68	4.03	0.68	-5.36	0.000
Impatient, independent, creative, cynical.	3.18	0.99	3.23	1.07	-0.34	0.733
Determined, people-oriented, optimistic & need supervision.	3.70	0.65	4.04	0.67	-4.20	0.000

Table 3 compares the inter-generational perceptions of Thai University students regarding the teaching and learning environment and associated issues. In absolute terms and every single item listed in Table 3, the Generation X sustained a more positive impression of the teaching and learning environment, and the mean differences in perceptions were statistically significant in all cases with two exceptions as follows:

- Generation X and Y both believed in equal measure that their class examples drew on prior experience. Similarly the two generations agreed that they possessed academic grounding to understand the lecture material. The mean agreement with the statements included in the survey instrument was statistically significant in the following areas:

- There was greater agreement by Generation X (3.81) that an appropriate amount of material was presented in class than their younger colleagues (3.64, t= -2.52, p<0.05).

- Generation X (3.95) was more likely to feel that teaching and learning material was well organized by their teachers than was the case with Generation Y (3.67, t=-4.17, p<0.01).
- The learning and teaching material were presented with greater clarity by teachers of Generation X (3.95) than was applicable to Generation Y (3.65, t= -3.67, p<0.01).
- More variety of activities was used in the class of Generation X (3.85) than was in the class of Generation Y (3.63, t=-2.80, p<0.01).
- There was greater agreement by Generation X (3.92) that appropriate activities were used in class than their younger counterparts (3.63, t= -4.47, p<0.01).
- Generation X (4.13) was more likely to be in classes where the academics encourage group study than Generation Y (3.70, t= -6.08, p<0.01).
- The Generation X students were more actively involved in classes (3.88) than Generation Y (3.64, t=-3.10, p<0.01).
- Generation X (3.92) was more likely to be in classes where the academics asked questions to see what the students knew about the lecture topic than Generation Y (3.63, t= -4.60, p<0.01).
- The Generation X students (4.00) sustained more polite and enthusiastic receipt of their questions by the academic staff than was perceived by Generation Y to be the case in the classroom (3.59, t=-6.32, p<0.001). This is by reason of the age difference between these two generations and resulting in the lecturers' different treatment of them.
- Greater encouragement was provided by academics teaching Generation X (4.12) to ask questions in class than was the case with Generation Y (3.67, t=-5.81, p<0.01).
- There was greater agreement by Generation X (3.91) that appropriate media was used in class than their younger colleagues (3.71, t= -2.55, p<0.05).
- Generation X (3.92) was more likely to be in classes where the learning and teaching process involves both the students and the lecturers than Generation Y (3.74, t= -2.35, p<0.05).
- Generation X (4.08) was more likely to enjoy attending classes than was the case with Generation Y (3.73, t=-4.53, p<0.01).
- There was greater agreement by Generation X (4.13) that their program develops up to-date knowledge and skills needed by employers than their younger colleagues (3.68, t= -6.47, p<0.01).
- Similarly, there was greater agreement by Generation X (4.00) that they have developed the ability to think critically than their younger colleagues (3.67, t= -4.17, p<0.01).
- Generation X (3.87) was more likely to feel that their University developed a capacity for creativity and innovation than was the case with their younger counterparts (3.56, t=-4.56, p<0.01).
- Generation X (3.97) was more likely to feel that they have developed skills for on-going self-directed learning than Generation Y (3.62, t=-5.07, p<0.01).
- Generation X (3.85) was more likely to feel that they have competence in using appropriate technology than was the case with their younger counterparts (3.63, t=-2.90, p<0.01).

Table 3: Differences in Generational Perceptions of University Learning and Teaching

Item	Generation Y		Generation X		t Value	Probability
	Mean	S.D.	Mean	S.D.		
Academic background to understand lectures	3.58	0.61	3.69	0.64	-1.47	0.141
Class examples drew on prior experience	3.50	0.68	3.56	0.79	-0.71	0.475
Appropriate amount of material presented in class	3.64	0.62	3.81	0.56	-2.52	0.013
Teaching & learning material well-organised	3.67	0.62	3.95	0.52	-4.17	0.000
Teaching & learning presented with clarity	3.65	0.67	3.95	0.66	-3.67	0.000
Variety of activities used in class	3.63	0.71	3.85	0.63	-2.80	0.006
Class activities appropriate	3.63	0.67	3.92	0.51	-4.47	0.000
Encourage group activity	3.70	0.71	4.13	0.55	-6.08	0.000
Students actively involved in class	3.64	0.66	3.88	0.64	-3.10	0.003
Teachers asked questions to see what students knew	3.63	0.67	3.92	0.49	-4.60	0.000
Student questions well-received	3.59	0.71	4.00	0.49	-6.32	0.000
Student questions encouraged	3.67	0.70	4.12	0.62	-5.81	0.000
Appropriate media used in class	3.71	0.69	3.91	0.62	-2.55	0.012
Students & teachers both involved in class	3.74	0.67	3.92	0.61	-2.35	0.021
Enjoy attending classes	3.73	0.71	4.08	0.61	-4.53	0.000
Knowledge & skills developed	3.68	0.69	4.13	0.55	-6.47	0.000
Develop critical thinking	3.67	0.68	4.00	0.64	-4.17	0.000
Develop creativity & innovation	3.56	0.67	3.87	0.53	-4.56	0.000
Self-directed learning	3.62	0.69	3.97	0.54	-5.07	0.000
Competence in technology	3.63	0.76	3.85	0.59	-2.90	0.005

Perceptions of Teaching and Learning Environment by Gender

Table 4 presents a comparative analysis of the values perceptions of Male Generation Y and Female Generation Y at the Thai Case Study institutions. With only one exception, female Generation Y sustained greater mean scores than male students with the following statistically significant results:

- Female Generation Y (mean agreement= 3.73) were more likely to agree that their core values included dedication, respect for authority and adherence to rules than were the case with Male Generation Y (3.51, $t=-3.53$, $p<0.01$).
- Female Generation Y (mean agreement= 3.96) were more likely to believe that their core values included optimism, personal gratification, health and wellness than were the case with Male Generation Y (3.83, $t=-2.20$, $p<0.05$).
- Female Generation Y (3.91) were more likely to agree that their core values included civic duty, achievement , sociability, informality and street smarts than their Male counterparts (Mean= 3.71, $t= -3.37$, $p<0.01$).
- Female Generation Y (mean agreement= 3.78) exhibited greater agreement that their core values included being determined, people-oriented, optimistic and need supervision and structure in the workplace than was the case with Male Generation Y (3.60, $t=-3.24$, $p<0.01$).
- In statistical terms the two groups were likely to share a number of values including; diversity, balance, fun and techno-literacy; they were equally hard working, loyal, will do whatever is asked and favour delayed reward in the workplace; the two generations were in equal measure team-oriented, sensitive to feedback and self-promotion driven. Finally the two groups were equally impatient, independent, process-averse, creative, cynical and favour multi-tasking.

Table 4 Gender Differences in Generation Y Students Perceptions of Value

Item	Male		Female		t value	Probability
	Mean	S.D.	Mean	S.D.		
Core values of dedication, respect authority & adherence to rules.	3.51	0.79	3.73	0.61	-3.53	0.000
Core values of optimism, personal gratification, health & wellness.	3.83	0.71	3.96	0.64	-2.20	0.028
Core values of diversity, balance, fun & techno-literacy.	3.74	0.70	3.82	0.62	-1.40	0.163
Core values of civic duty, achievement, sociability, informality & street smart.	3.71	0.71	3.91	0.66	-3.37	0.001
Hard working, Loyal & delayed rewards.	3.59	0.69	3.61	0.71	-0.42	0.676
Team-oriented, sensitive to feedback and self-promotion.	3.59	0.71	3.57	0.66	0.25	0.806
Impatient, independent, creative, cynical.	3.14	0.96	3.23	1.02	-1.02	0.306
Determined, people-oriented, optimistic & need supervision.	3.60	0.68	3.78	0.62	-3.24	0.001

Table 5 compares the gender perceptions of Generation Y Students regarding the teaching and learning environment and associated issues. In almost every single item listed in table 5, female Generation Y and male Generation Y sustained the similar impression of the teaching and learning environment, though the mean agreement with the statements were statistically significant only in the following areas:

- Male Generation Y were more actively involved in classes (3.71) than Female Generation Y (3.57, $t= 2.43$, $p<0.05$).
- Similarly, Male Generation Y (3.77) perceived greater encouragement for group activity than their female counterparts (3.64, $t=2.03$, $p<0.05$).

Table 5 Differences in Gender Perceptions in Generation Y of University Learning and Teaching

Item	Male		Female		t value	Probability
	Mean	S.D.	Mean	S.D.		
Academic background to understand lectures	3.57	0.60	3.59	0.62	-0.30	0.763
Class examples drew on prior experience	3.51	0.67	3.49	0.69	0.22	0.825
Appropriate amount of material presented in class	3.64	0.63	3.63	0.61	0.20	0.845
Teaching & learning material well-organised	3.65	0.66	3.69	0.59	-0.70	0.483
Teaching & learning presented with clarity	3.65	0.67	3.65	0.67	0.01	0.988
Variety of activities used in class	3.65	0.69	3.61	0.74	0.72	0.473
Class activities appropriate	3.63	0.73	3.62	0.62	0.11	0.911
Encourage group activity	3.77	0.73	3.64	0.68	2.03	0.043
Students actively involved in class	3.71	0.70	3.57	0.62	2.43	0.015
Teachers asked questions to see what students knew	3.67	0.71	3.59	0.64	1.28	0.201
Student questions well-received	3.59	0.72	3.60	0.70	-0.12	0.903
Student questions encouraged	3.64	0.71	3.69	0.68	-0.86	0.389
Appropriate media used in class	3.71	0.68	3.70	0.71	0.18	0.859
Students & teachers both involved in class	3.73	0.67	3.75	0.66	-0.29	0.773
Enjoy attending classes	3.77	0.71	3.70	0.70	1.06	0.290
Knowledge & skills developed	3.64	0.71	3.71	0.67	-1.08	0.280
Develop critical thinking	3.63	0.66	3.70	0.70	-1.24	0.216
Develop creativity & innovation	3.56	0.71	3.56	0.64	0.03	0.974
Self-directed learning	3.64	0.70	3.60	0.68	0.67	0.500
Competence in technology	3.67	0.78	3.60	0.74	1.11	0.268

Table 6 presents a comparative analysis of the values perceptions of Male Generation X and Female Generation X at the Thai Case Study University. In statistical terms there were no statistically significant results, permitting the observation that the two groups share equally the core values included in Table 6.

Table 6 Gender Differences in Generation X Students Perceptions of Value

Item	Male		Female		t value	Probability
	Mean	S.D.	Mean	S.D.		
Core values of dedication, respect authority & adherence to rules.	3.83	0.59	3.97	0.62	-1.05	0.299
Core values of optimism, personal gratification, health & wellness.	4.33	0.53	4.49	0.51	-1.34	0.183
Core values of diversity, balance, fun & techno-literacy.	4.15	0.62	4.06	0.64	0.64	0.526
Core values of civic duty, achievement, sociability, informality & street smart.	4.08	0.57	4.06	0.59	0.13	0.895
Hard working, Loyal & delayed rewards.	3.65	0.77	3.66	0.76	-0.04	0.968
Team-oriented, sensitive to feedback and self-promotion.	4.00	0.68	4.06	0.68	-0.36	0.718
Impatient, independent, creative, cynical.	3.30	1.02	3.14	1.14	0.63	0.530
Determined, people-oriented, optimistic & need supervision.	3.98	0.70	4.11	0.63	-0.90	0.370

Table 7 compares the gender differences in perceptions of Generation X students regarding the teaching and learning environment and associated issues. In almost every single item listed in table 7, female Generation X and male Generation X sustained the similar impression of the teaching and learning environment, though the mean agreement with the statements were statistically significant only in one area as follows:

- Female Generation X (4.00) was more likely to feel that their University developed a capacity for creativity and innovation than was the case with Male Generation X (3.75, $t=-2.11$, $p<0.05$).

Table 7 Differences in Gender Perceptions in Generation X of University Learning and Teaching

Item	Male		Female		t value	Probability
	Mean	S.D.	Mean	S.D.		
Academic background to understand lectures	3.70	0.56	3.69	0.56	0.10	0.923
Class examples drew on prior experience	3.45	0.75	3.69	0.75	-1.29	0.201
Appropriate amount of material presented in class	3.83	0.55	3.80	0.55	0.19	0.849
Teaching & learning material well-organised	3.95	0.56	3.94	0.56	0.05	0.962
Teaching & learning presented with clarity	3.90	0.71	4.00	0.71	-0.66	0.513
Variety of activities used in class	3.79	0.61	3.91	0.61	-0.81	0.422
Class activities appropriate	3.85	0.58	4.00	0.58	-1.29	0.200
Encourage group activity	4.18	0.55	4.09	0.55	0.69	0.490
Students actively involved in class	3.80	0.69	3.97	0.69	-1.18	0.241
Teachers asked questions to see what students knew	3.95	0.50	3.89	0.50	0.57	0.572
Student questions well-received	4.05	0.50	3.94	0.50	0.94	0.351
Student questions encouraged	4.18	0.55	4.06	0.55	0.80	0.424
Appropriate media used in class	3.90	0.59	3.91	0.59	-0.10	0.921
Students & teachers both involved in class	3.95	0.64	3.89	0.64	0.45	0.652
Enjoy attending classes	4.13	0.69	4.03	0.69	0.69	0.490
Knowledge & skills developed	4.18	0.59	4.09	0.59	0.69	0.490
Develop critical thinking	4.03	0.66	3.97	0.66	0.36	0.719
Develop creativity & innovation	3.75	0.54	4.00	0.54	-2.11	0.039
Self-directed learning	3.93	0.57	4.03	0.57	-0.82	0.415
Competence in technology	3.90	0.67	3.79	0.67	0.77	0.445

Table 8 presents a comparative analysis of the values perceptions of Undergraduate Generation Y and Post Graduate Generation Y at the Thai Case Study University. In statistical terms there were no statistically significant results, thus suggesting that the two groups share equally the core values listed in Table 8.

Table 8 Level of Education Differences in Generation Y Students Perceptions of Value

Item	Undergraduate		Postgraduate		t value	Probability
	Mean	S.D.	Mean	S.D.		
Core values of dedication, respect authority & adherence to rules.	3.62	0.71	4.50	0.7	-1.75	0.081
Core values of optimism, personal gratification, health & wellness.	3.89	0.68	4.50	0.7	-1.26	0.207
Core values of diversity, balance, fun & techno-literacy.	3.78	0.66	4.50	0.7	-1.53	0.126
Core values of civic duty, achievement, sociability, informality & street smart.	3.81	0.69	4.50	0.7	-1.41	0.160
Hard working, Loyal & delayed rewards.	3.59	0.70	4.50	0.7	-1.84	0.067
Team-oriented, sensitive to feedback and self-promotion.	3.58	0.68	4.50	0.7	-1.91	0.056
Impatient, independent, creative, cynical.	3.18	0.99	4.50	0.7	-1.88	0.060
Determined, people-oriented, optimistic & need supervision.	3.69	0.65	4.50	0.7	-1.75	0.081

Table 9 compares the Educational Level perceptions of Generation Y students regarding the teaching and learning environment and associated issues. In every single item listed in table 9, Postgraduate Generation Y sustained greater mean scores than Undergraduate Generation Y students with the following statistically significant results:

- Postgraduate Generation Y (4.50) were more confident about their academic background to understand the lecture material than was the case with Undergraduate Generation Y (3.58, $t=-2.15$, $p<0.05$).
- Postgraduate Generation Y (4.50) were more likely to think that the examples used in class drew upon their prior experiences than Undergraduate Generation Y (3.49, $t= -2.10$, $p<0.05$).

- There was greater agreement by Postgraduate Generation Y (4.50) that an appropriate amount of material was presented in class than Undergraduate Generation Y (3.63, $t= -1.98$, $p<0.05$). .
- There was greater agreement by Postgraduate Generation Y (4.00) that an appropriate media was used in class than observed with Undergraduate Generation Y (3.71, $t= -9.69$, $p<0.01$).
- Postgraduate Generation Y (4.00) was more likely to be in classes where the learning and teaching process involves both the students and the lecturers than Undergraduate Generation Y (3.74, $t= -9.04$, $p<0.01$).
- Postgraduate Generation Y (4.00) were more likely to enjoy attending classes than was the case with Undergraduate Generation Y (3.73, $t=-8.75$, $p<0.01$).
- There was greater agreement by Postgraduate Generation Y (4.00) that their program develops up to-date knowledge and skills needed by employers than was the case with Undergraduate Generation Y (3.68, $t= -10.83$, $p<0.01$).
- Postgraduate Generation Y (4.00) was more likely to feel that their University developed a capacity for creativity and innovation than was the case with Undergraduate Generation Y (3.56, $t=-15.18$, $p<0.01$).
- Postgraduate Generation Y (4.00) was more likely to feel that they have developed skills for on-going self-directed learning than Undergraduate Generation Y (3.62, $t=-12.74$, $p<0.01$).
- Postgraduate Generation Y (4.00) was more likely to feel that they have competence in using appropriate technology than was the case with Undergraduate Generation Y (3.63, $t=-11.25$, $p<0.01$).

Table 9 Differences in Educational Level Perceptions in Generation Y of University Learning and Teaching

Item	Undergraduate		Postgraduate		t value	Probability
	Mean	S.D.	Mean	S.D.		
Academic background to understand lectures	3.58	0.61	4.50	0.71	-2.15	0.032
Class examples drew on prior experience	3.49	0.67	4.50	0.71	-2.10	0.036
Appropriate amount of material presented in class	3.63	0.62	4.50	0.71	-1.98	0.048
Teaching & learning material well-organised	3.67	0.62	4.50	0.71	-1.89	0.059
Teaching & learning presented with clarity	3.65	0.67	4.50	0.71	-1.80	0.073
Variety of activities used in class	3.63	0.71	4.50	0.71	-1.73	0.084
Class activities appropriate	3.62	0.67	4.50	0.71	-1.85	0.065
Encourage group activity	3.70	0.71	4.50	0.71	-1.61	0.109
Students actively involved in class	3.63	0.66	4.50	0.71	-1.84	0.066
Teachers asked questions to see what students knew	3.63	0.67	4.50	0.71	-1.84	0.067
Student questions well-received	3.59	0.71	4.50	0.71	-1.81	0.071
Student questions encouraged	3.67	0.70	4.50	0.71	-1.69	0.091
Appropriate media used in class	3.71	0.69	4.00	0.00	-9.69	0.000
Students & teachers both involved in class	3.74	0.67	4.00	0.00	-9.04	0.000
Enjoy attending classes	3.73	0.71	4.00	0.00	-8.75	0.000
Knowledge & skills developed	3.68	0.69	4.00	0.00	-10.83	0.000
Develop critical thinking	3.67	0.68	4.50	0.71	-1.73	0.084
Develop creativity & innovation	3.56	0.67	4.00	0.00	-15.18	0.000
Self-directed learning	3.62	0.69	4.00	0.00	-12.74	0.000
Competence in technology	3.63	0.76	4.00	0.00	-11.25	0.000

Table 10 presents a comparative analysis of the values perceptions of Undergraduate Generation X and Post Graduate Generation X at the Thai Case Study institutions. In statistical terms the two groups were likely to share a number of values. However, Post Graduate Generation X sustained greater mean scores than Undergraduate Generation X in the following case:

- Postgraduate Generation X (mean agreement= 4.45) students were more likely to believe that their core values included optimism, personal gratification, health and wellness than were the case with Undergraduate Generation X (4.00, $t=-2.56$, $p<0.05$).

Table 10 Level of Education Differences in Generation X Students Perceptions of Value

Item	Undergraduate		Postgraduate		t value	Probability
	Mean	S.D.	Mean	S.D.		
Core values of dedication, respect authority & adherence to rules.	3.78	0.67	3.91	0.60	-0.61	0.545
Core values of optimism, personal gratification, health & wellness.	4.00	0.50	4.45	0.50	-2.56	0.028
Core values of diversity, balance, fun & techno-literacy.	3.89	0.33	4.14	0.65	-1.80	0.088
Core values of civic duty, achievement, sociability, informality & street smart.	4.00	0.50	4.08	0.59	-0.37	0.715
Hard working, Loyal & delayed rewards.	3.67	0.71	3.65	0.77	0.06	0.956
Team-oriented, sensitive to feedback and self-promotion.	4.11	0.33	4.02	0.71	0.40	0.693
Impatient, independent, creative, cynical.	3.67	0.71	3.17	1.10	1.84	0.087
Determined, people-oriented, optimistic & need supervision.	4.00	0.00	4.05	0.71	-0.52	0.605

Table 11 compares the Educational Level perceptions of Generation X Students regarding the teaching and learning environment and associated issues. In most cases

Undergraduate Generation X sustained greater mean scores than Postgraduate Generation X students with the following statistically significant results:

- Undergraduate Generation X (4.00) sustained more confidence about their academic background to understand the lecture material than was the case with Postgraduate Generation X (3.65, $t=-4.24$, $p<0.01$).
- Undergraduate Generation X (4.00) were more likely to be in the class where the examples used drew upon their prior experiences than Postgraduate Generation X (3.50, $t= 4.91$, $p<0.01$).

Table 11 Differences in Educational Level Perceptions in Generation X of University Learning and Teaching

Item	Undergraduate		Postgraduate		t value	Probability
	Mean	S.D.	Mean	S.D.		
Academic background to understand lectures	4.00	0.00	3.65	0.67	4.24	0.000
Class examples drew on prior experience	4.00	0.00	3.50	0.83	4.91	0.000
Appropriate amount of material presented in class	3.89	0.33	3.80	0.59	0.65	0.526
Teaching & learning material well-organised	4.00	0.00	3.94	0.56	0.89	0.375
Teaching & learning presented with clarity	4.11	0.33	3.92	0.69	1.34	0.196
Variety of activities used in class	4.00	0.50	3.83	0.65	0.91	0.379
Class activities appropriate	3.89	0.33	3.92	0.54	-0.19	0.848
Encourage group activity	3.89	0.33	4.17	0.57	-2.11	0.051
Students actively involved in class	4.00	0.50	3.86	0.65	0.60	0.550
Teachers asked questions to see what students knew	4.00	0.00	3.91	0.52	1.43	0.159
Student questions well-received	4.00	0.00	4.00	0.53	0.00	1.000
Student questions encouraged	4.00	0.00	4.14	0.66	-1.70	0.095
Appropriate media used in class	3.89	0.33	3.91	0.65	-0.09	0.928
Students & teachers both involved in class	3.67	0.71	3.95	0.59	-1.34	0.186
Enjoy attending classes	3.78	0.67	4.12	0.60	-1.60	0.114

Item	Undergraduate		Postgraduate		t value	Probability
	Mean	S.D.	Mean	S.D.		
Knowledge & skills developed	4.00	0.50	4.15	0.56	-0.77	0.445
Develop critical thinking	4.00	0.50	4.00	0.66	0.00	1.000
Develop creativity & innovation	3.67	0.71	3.89	0.50	-1.21	0.229
Self-directed learning	3.67	0.71	4.02	0.51	-1.83	0.071
Competence in technology	3.67	0.71	3.88	0.57	-1.00	0.319

Qualitative Perceptions of Students

This section presents the qualitative perceptions of Generation X and Generation Y to the learning and teaching environment at the Thai universities. This provides the two generations' suggestions for improving the learning and teaching environment at the Thai Universities and any other suggestions for the academic staff in the program.

Regarding the observations from Generation Y for improving the learning and teaching environment at the Thai Universities, they suggested that the universities should perform or take into consideration the following:

1. University Facilities

- The universities should provide more modern teaching related equipment.
- The universities should provide sufficient and modern facilities including the computers, the library with more new textbooks, students' lounges, auditorium, cafeteria, bathrooms, elevators and the escalator, as applicable.
- Classrooms should have modern and better equipment and ought to be air-conditioned.
- The campus area should be extended to include the good ecological system around the campus.

2. Teaching Method

- Improving teaching methods to allow students to actively participate in classrooms.
- Improving technology to allow access to information resources.
- Requiring the different methods of teaching.
- Requiring the emphasis on learning method with industrial experience as additional training or visiting factory or the learning method with less theory and more practical applications.
- Requiring the guest lecturers from business sector.

- Requiring the rigorous assessment system for preventing the students defrauding in examination. Perhaps multiple examination papers could be provided in the same exam room.
- The lecturers should improve their teaching method consistent with the environmental change and performing the teaching evaluation regularly. Importantly, the students suggest that one lecturer should not teach many subjects so that they can then focus their attention on quality of the outcomes rather than simply throughput.
- Stimulating incessant learning and creative thinking.
- Taking good care of all of the students in class, not only the students in the front of the class.

3. The Administration

- Establishing clubs that emphasize on specialized areas for students participation in their free time.
- Discontinue the rigorous rules relating to the wearing of the undergraduate uniforms.
- Developing the efficient registration system by providing faster and continuously improved service.
- Promoting smaller class sizes for effective learning.
- Provide more subject choices for the elective category.

However there were some Generation Y respondents that were satisfied with the existing learning and teaching environment as they are and hence there were no suggestions for change or improvement from this group.

Generation X presented the suggestions for improving the learning and teaching environment at the Thai Universities as follows:

1. University Facilities

- The universities should provide sufficient and modern facilities including the new model computers, the updated library with new textbooks, longer hours or twenty four hours service students' lounges with some necessary textbooks and access to restrooms for longer hours.
- Provision of the rigorous system for preventing the students defrauding in examinations.

2. Teaching Method

- Requiring two ways communication and more discussion in the class and less emphasis on the term papers.
- Stimulating creative thinking.
- Placing importance on both theory and practice or the applications of knowledge.
- Forming closer links with industry including inviting the successful businessmen from the business sectors as the guest lecturers.

3. The administration

- Improving the communication channels between the administration and the students.
- Building brand image of the graduate students.
- Having more support staff to contribute to the learning and teaching system.

There were some Generation X respondents that were satisfied with the existing learning and teaching environment as they informed that the present system was meeting their expectations in this regard.

It seems that both generations expressed concern regarding new and modern facilities requirement. Some minor difference is that the younger generation expects the classroom condition to be improved. The older generation requires something relating to their situation and status such as sufficient parking area. Regarding teaching method, both generations require stimulating incessant learning and critical thinking, not only emphasizing theory but also the special applied lectures from the business people. Concerning the administration, both generations require generating the good image of the students and the university and good supporting system to enhance the teaching and learning. However the younger generation requires downscaling of the classrooms and the abandoning of the stern uniform procedure whilst the older generation requires the easier channel to propel their comments to the administration.

Concerning the suggestions of Generation Y for the academic staff in the program, they recommended that these staff should improve the following:

- Providing an environment that stimulates new ideas.
- Being receptive towards the students' viewpoints.
- Encouraging students' participation in the class.
- Exploit the examples relating to the lecturers' experiences.
- Place more emphasis on making their teaching clear and understandable.
- Engaging in good preparation for their teaching.
- Inject some humor in their teaching.
- Continuously exploiting the new technology for academic purposes.
- Regulating the curriculum consistent with the environment.
- More discussions regarding the world situation (globalization).
- Be self punctual and encourage punctuality from students in terms of class attendance..
- Be sympathetic towards students.
- Do not be prejudicial.
- Be rational and not too emotional.
- Have high-quality standard in teaching and evaluation.
- Do not be too serious.
- Effectively managing the teaching time throughout the course.
- The lecturers ought not to speak too fast in the classrooms.
- Appointment of the experienced lecturers.
- Be flexible in assigning the papers and submitting them.
- Encouraging the students to participate in course design.

- Eliminate the generation gap between the lecturers and the students.
- Place importance on the English language and other business foreign languages.
- Be just to students.
- Be the good advisor and taking good care of the students.
- Include industry based learning through the visiting of factories or the business sector.
- Acquire good communication skills. Unfortunately some highly qualified lecturers are deficient in communication skills.
- Do not be verbose.
- Be ethical in their professions.
- There should be a greater proportion of full time lecturers than the part time lecturers since the latter do not have available time for the student consultations. Yet there is a need to increase the number of guest lecturers for special classes so that the students have greater exposure to people from the business sector.
- Encouraging the students to ask the questions in the class.
- Develop the effective procedure for dealing with the misbehaving students.

However there were some respondents in the Thai Generation Y that were satisfied with the lecturers and informed that the lecturers are good and do not require any changes.

Concerning the suggestions of Generation X for the academic staff in the program, they proposed that the academic staff should consider the following issues:

- Increasing the number of guest lecturers from business sector.
- The long term lecturers ought to update their text books and handouts on a regular basis.
- Make the subject easier to understand and not so lengthy in terms of presentation.
- Provide more opportunities for comments after the students' presentation.
- Prepare well before teaching.
- Be punctual both at the beginning and at the conclusion of the class.
- Continuously exploiting the new technology in assignments and communication.
- Teaching must be consistent with the teaching plan or course outline.
- Emphasize learning with the application of case studies.
- Appointing more qualified new generation lecturers with experience of the private or public sector.
- Brainstorming the students' idea for improving the course.
- Provide good recommendation about the information source relating to learning and doing business.
- Encouraging the sharing of best practices among the students.
- Emphasize on application of knowledge rather than just theory.

However there were some respondents in the Thai Generation X that were satisfied with the lecturers' preparation for teaching and informed that the classes were well prepared and hence no suggestions were offered for future improvements.

It seems that both generations require the lecturers that encourage the students in thinking and participating in the class, be punctual and continuously exploiting the new technology to enhance the learning and teaching process. Though it seems that Thai Generation Y require reasonably perfect role model lecturer.

CONCLUSION

The Thai Generation X shares some similar values to the "American Seniors" as characterized by Aldridge (2001). For instance both groups express dedication, respect for authority and adherence to rules. Could this be due to the greater cultural conservatism in the East or is it simply the case that the Western values take time to diffuse to the East and be accepted by them? Clearly these hypotheses require further and more comparative institutional research in the Asia Pacific Region. Given the proximity of geographical coverage and spheres of influence by SEAAIR and AAIR, perhaps they can encourage greater cooperative efforts to implement such joint institutional research projects in the future.

An area of divergence of inter-generational values between the West (as underscored by the American research) and the East (as per this Thai research) emanates from the fact that, as noted previously (please refer to the earlier reference to Aldridge, 2001), in the West it is generation X that tends to be impatient, independent, process averse, creative, cynical and favour multi-tasking, however, in the Thai case these values are equally represented in Generation Y. Again there appears to be a temporal lag before the East catches up with the West in terms of values, possibly again suggesting that the diffusion of cultural aspects takes time when moving between the two societies.

An area of convergence in the findings between the American studies and this investigation relates to the comment by Campbell and Bruneau (2003) who suggest some overlapping values between Generations X and Y. It is suggested that some of the over-lapping areas, such as being hard working, can clearly be used by academic staff to enhance the learning and teaching of Thai students. The present research indicates that class group activity was highly rated by both Generation X and Y and perhaps teaching staff can make greater use of this fact to not only encourage teamwork within the classroom but also out side, for example, through the greater use of team projects and the like in the learning and teaching processes.

The consistently better ratings given by Generation X to the learning and teaching environment by the Thai students have a possible explanation. In particular, clearly Generation X is older than Generation Y and within this Thai University student population, our findings indicate that the undergraduate students tend to enter the University straight from secondary school. This implies that the older students are mainly in the postgraduate programs and that they predominantly represent Generation X. Clearly the classroom environment for undergraduate and postgraduate students within the Thai context is quite different. Typically the postgraduate students pay higher fees and hence enjoy, for example, smaller classes and therefore have more conducive

environment for learning and teaching than would be the case with undergraduate Thai students. This would then explain the more positive findings in relation to Generation X regarding their learning and teaching environment.

The qualitative part of the study found that both Generation Y and Generation X require embracing the newer and more modern facilities by the Thai universities. Concerning teaching method, both generations require teaching to include a good mix of theory and practice and guest lecturers from business sector to be involved. Regarding the administration both generations require generating the good image of the students and the university and good support system to enhance the teaching and learning. However there are some different opinions among these two generations as Generation Y emphasize on the condition of classroom and suitability of class size and lightening up of some educational procedures.

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