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EDITOR'S NOTE

Welcome to this edition of JIRSEA.

As in the past we present to you in this edition seven papers judged by the Editorial Board to be of interest to Institutional Researchers. Papers have come from China, Indonesia, Thailand, Australia and Malaysia and not all have been presented at the SEAAIR conference(s). The scope is also as varied, from medical education to campus culture in China. The first paper in this edition is a revised Best Paper from SEAAIR Conference 2005 which was presented by the author at this year's AIR Forum in Chicago.

I am also pleased to let readers know that JIRSEA from this edition onwards is indexed with appropriate international indexing networks, thus making it even more prestigious and recognized in the area of institutional research and as an international reference.

That we begin to include papers and articles which had not been presented at an SEAAIR conference in itself is a sign of JIRSEA's maturity. I therefore invite readers to publicise JIRSEA's existence and standing to their colleagues and to contribute to JIRSEA. Papers and articles are to be sent to Dr Raj Sharma on rsharma@swin.edu.au

I am also pleased to let readers know that the SEAAIR Conference 2006 held in the resort island of Langkawi, Malaysia went very well. Almost 90 papers were presented and 3 Keynote speeches given respectively by the Deputy Director General from the Malaysian Ministry of Higher Education, the Vice-Chancellor of University Sains Malaysia and the Vice- Chancellor of Zimbabwe Open University. The Conference was hosted by the Open University Malaysia.

The 2007 SEAAIR Conference will be held at Assumption University in Bangkok, Thailand with the Theme: ***Self-sufficient and Sustainable Higher Education – An Agenda.*** Papers for the conference should be sent to Dr Raj Sharma at above email address. Similarly if you have papers you would like published in JIRSEA. Please visit our website http://www.seaair.info for further information on any aspects of SEAAIR activities.

Happy reading,

Nirwan Idrus
Editor

A CASE FOR RECONSTRUCTION OF THE PEDAGOGY OF THE MALAYSIAN UNIVERSITY ENGLISH TEST (MUET) THROUGH THEMATIC UNITS INSTRUCTION

Naginder Kaur, Rohayah Nordin

ABSTRACT

Universiti Teknologi MARA Malaysia (UiTM) devotes 70% of its courses to diploma programmes,). Consequently, a lot of emphasis is placed on preparing its students for the Malaysian University English Test (MUET). MUET is an entry test of four different papers (based on each language skill) and is a pre-requisite to gain entry to degree programmes, upon completion of the pre-university courses of diploma programmes. In preparing students for this exam, lecturers fervently adopt various pedagogical approaches, which sometimes do not yield satisfactory results as the preparatory course for the MUET is perceived laborious and heavy in content. The exam is viewed a big challenge by many students due to lack of language ability. This implies weaknesses such as limited vocabulary, grammar and language sub-skills, causing a major block to gain a good band score. This study explores an avenue of pedagogical reform by using thematic units approach as the way to bring about improvement in students' language ability. The receptive skill of reading and the productive skill of writing are probed to ascertain the extent of improvement. The input revolves around themes, pertinent to the MUET exam, which are presented cumulatively and spirally via the four language skills to enable students to broaden their schemata. It was found that thematic units instruction is able to improve students' reading and writing abilities and is advocated as the apt pedagogical approach in preparing students for the MUET exam thus, ensuring continuous quality advancement in higher education.

INTRODUCTION

As a university that devotes 70% of its courses to diploma programmes, Universiti Teknologi MARA Malaysia (UiTM) offers English language proficiency and preparatory courses at Part 1, 2 and 3 to all students undertaking diploma programmes to prepare them for the Malaysian University English Test (MUET), which they need to sit for before / by the time they graduate. A lot of emphasis is placed by language lecturers to ensure optimum level performance among students. Being a criterion-referenced test of a language standard, determined by the Ministry of Education, Malaysia, similar to foreign-based tests such as TOEFL (The Test of English as a Foreign Language), IELTS (International English Language Testing System) and ESOL exams (English for Speakers of Other Languages), MUET serves to gauge the overall English Language proficiency of

candidates in the cumulative score of the four language skills, handed down in a single Band Score – ranging from the lowest, Band 1 to the highest, Band 6. The test constitutes four different papers, respectively testing the language skills of listening, speaking, reading and writing. Its significance to pre-degree students is paramount, as it sets the de facto standard of a student's language proficiency level to enable him / her to qualify for the degree programme of his / her choice. For example, students aspiring to pursue law need to obtain a Band Score of 5. Accounting students must at least make to it Band 3 etc.

PROBLEM STATEMENT

At UiTM, English language has been the medium of instruction in almost all courses offered at diploma and degree level in recent years. This policy is lauded and seen as a far-sighted strategy in order to give its graduates the competitive edge in the borderless global market of communication, economics, finances, business transactions, technology, education and medical science, as the aim of learning a language is to be able to perform different functions. (Wilkins, 1972). It is also a commendable effort in realising the university's vision to be a world-class university by 2006. However, problems arise in this quest as the UiTM system has not equipped itself adequately with the changing policy. The content and outmoded pedagogical approaches to the curriculum do not complement the change in policy. There is no reform, for example, in the English Language syllabus to meet the demand of the new policy. The university has not only failed in resilience to adapt itself but has also not sufficiently acknowledged and addressed the needs of the students who need the language to function beyond formal learning. As a result, lecturers from various courses at UiTM lament that despite having gone through 3 compulsory English courses at diploma level, the students still do not master the language and continue to encounter language predicaments in their studies. One possible reason for this problem is because there exists a gap between the needs of the courses and the English Language syllabus. For example, the critical skills of argumentation and rhetorical convention, prerequisites of university curricula are absent in the English as a Second Language (ESL) classes. According to Leki and Carson (1994), ESL classes often ask for personal reaction papers but do not require "text responsible" writing where students must show that they have grasped course content. Smoke (1998) similarly shows a gap between the skills taught in ESL programmes and those needed in academic settings. Consequently, when students go out into the job market, they are unable to meet the on-the-job needs of language ability, hence frequent grouses and grievances among employers, with regard to the dismal language proficiency among Malaysian graduates.

The weak grasp of English language poses a major block in students' preparation for the MUET exam. The exam is viewed a big challenge by many students due to lack of language ability. This implies weaknesses such as limited vocabulary, grammar and language sub-skills, causing a formidable challenge in gaining a good band score, consequently, infringing their chances of entry to their programmes of choice. The lecturers, for example, are preoccupied about thoughts of how to best see the effectiveness of these 3 courses in preparing students for their studies and the MUET exam. In doing so, lecturers fervently adopt various pedagogical approaches, which

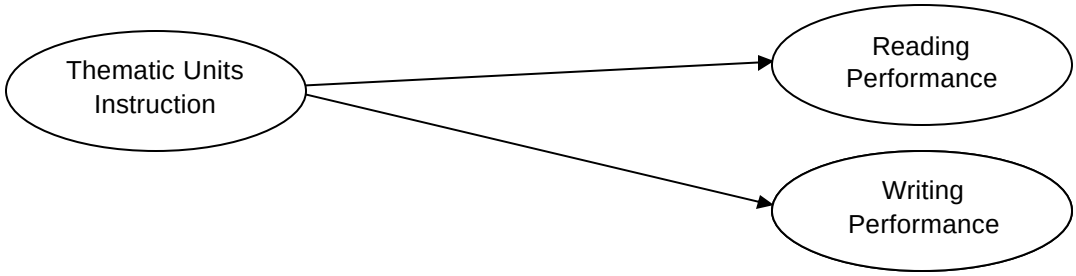
sometimes do not yield satisfying results as the preparatory course for the MUET is perceived laborious and heavy in content, being a course of EAP (English for Academic Purpose) in nature and approach. Although there is attention and concern about the lack of mastery of the language, alas, solutions and sound resolutions are yet to be seen.

SCOPE AND FRAMEWORK OF STUDY

One way to overcome language predicament and anxiety of preparing for the MUET exam is through the introduction and incorporation of theme-based teaching in the English language classrooms. This study explores an avenue of pedagogical reform as the backdrop for overall educational reforms by using thematic units approach as the way to bring about improvement in students' language ability. The scope of enquiry is the receptive skill of reading and the productive skill of writing to ascertain the extent of improvement. The input revolves around themes, pertinent to the MUET exam, which are presented cumulatively and spirally via the four language skills to enable students to broaden their schemata, consequently able to relate and respond to questions. This research attempts to answer the following questions:

1. Can language instruction using thematic units that focus on thematic units improve students' reading performance?
2. If yes, what is the extent of the improvement?
3. Can language instruction using thematic units that focus on content-area information improve students' writing performance?
4. If yes, what is the extent of the improvement?
5. How far does thematic units instruction ensure students' engagement in learning?

Figure 1: **Theoretical Framework of the Study**



According to Stoller and Grabe (1997), theme-based instruction can be classified into a framework called the Six T's Approach. In this principled approach, the content area resources are organised, together with the selection of appropriate language learning activities. The first T is theme – the central idea that organises major curricular units. The second T is the topic – subunit of content, which would explore the more specific and detailed aspects of the theme. Next, come texts – i.e. the stimuli or materials from various resources, which underpin the basic planning of theme units instruction. The fourth T is threads – abstract links (such as values) across units that ensure coherence among different themes. The fifth T is tasks, day-to-day instructional input and tasks,

which tie up content, language and strategy instruction. Finally, the T of transitions refers to explicit planned actions, which provide coherence and continuity from lesson to lesson, within a theme. Collectively, these T's ensure that students receive input in meaningful, social and academic context.

The development of the thematic approach can be traced to Krashen's (1982) theory of second language acquisition. Krashen suggests that a second language is most successfully acquired when the focus is on the meaning rather than the form, when the language input is at or just above the proficiency level of the learner, and when there is sufficient opportunity to engage in meaningful use of the language in an anxiety-free environment. In line with his Input Hypothesis, acquisition takes place when learners encounter language material a little beyond their current level of comprehension (i + I). As acquisition, proficiency and confidence are built alongside, students are gradually ready to acquire the other language skills and sub-skills to tackle the exam. Krashen posits a dichotomy between acquisition and learning, with the former serving to initiate all language and the latter serving only as a monitor or editor, activated when the learner is focussing on his / her language.

METHODLOGY, SAMPLE & TOOLS

Efficacy of the thematic units teaching and the extent of improvement in the language skills of reading and writing among students who underwent thematic units instructional approach were measured through a quasi-experimental approach. In order to facilitate data collection, the study adopted the quantitative as well as qualitative approach. Quantitative means were used to investigate the causal relationship between variables. Qualitative measures in the form of classroom observations and a focus group interview were also undertaken to describe an existing phenomenon, i.e. the students' level of engagement towards the instruction. The subjects of experimentation were two groups of Part 3 diploma students: Diploma in Banking (DIB) students and Diploma in Business Studies (DBS) students. English classes at UiTM Perlis are blocked according to programmes and all English classes of the same programme are conducted simultaneously (according to parts, i.e. Part 1, Part 2, Part 3). Consequently, it was not possible for the classes to be taught at the same time by the same lecturer (researcher). Hence, two groups from two different programmes, but of similar stream (commerce background) were chosen for this study. These Part 3 students undertook the preparatory course for the MUET exam, called Mainstream English II (BEL 250). The DIB group, was treated as the experimental group, and DBS group was the control group. The experimental group comprised a class of 26 students, while the control group was made up of a class of 34 students. The two classes had approximately the same level of English language proficiency since both groups had to pass two pre-requisite English language courses: BEL 100 (Preparatory English) and BEL 200 (Mainstream English I) before they could register for BEL 250 course. In addition, coming from the same area of study (business), both groups had presumably the same schemata and worldview. Furthermore, subsequent tests also confirm the proximity of both groups. Even though the experimental group was found to be slightly more proficient in the reading skill than the

control group (the paired samples statistics of the pre-test for reading found the *mean* scores of the experimental and control group to be 66.36 (SD=12.62) and 58.42 (SD=14.06) respectively), both groups were still considered to be at the intermediate proficiency level. Moreover, the groups were found to be almost comparable in the writing skill (the *mean* scores of the pre-test for writing of the experimental group and control group were found to be 47.58 (SD=9.41) and 49.50 (SD=5.79) respectively). Both classes were taught by the same lecturer who was also the participant observer in this study. This study was carried out in one-semester period (10 weeks). The experimental group received six (6) hours of thematic units teaching per week and was exposed to three salient and pertinent themes regularly appearing in the MUET exam. The themes covered were Teenage Issues & Crime, Environmental Issues and Cultural Issues. The control group, on the other hand, was taught using the traditional approach, based on the textbook stipulated by the university. Pre and post tests of reading and writing were given to both groups to determine the extent of reading and writing improvement. The reading test was in the form of 21 multiple-choice questions on three passages. The topics covered correlated with the three themes prepared in the theme units. The passages were taken from past-year BEL 250 reading tests and from MUET practice books. Meanwhile, the MUET Assessment Scale for Writing, comprising components of task fulfillment and language was used in evaluating the essays. Students' marks of the pre and post-tests were analysed using *paired t-test*. Qualitative tools of classroom observation and a focus group interview of 6 subjects from the experimental group were analysed descriptively to further triangulate the data as well as probe the degree of engagement among students.

FINDINGS

Findings on Research Questions 1 and 2

Reading performance of the experimental group and control group was analysed using the paired *t-test*. The paired samples tests on the pre and post-test *mean* scores of the control group resulted in a non-significant value of **0.741**. This shows that there is no difference in the *mean* scores of the pre and post-test. Even though there is a difference between the pre and post-test scores, which means that there is a difference in the students' performance, the difference is however non-significant and negligible in comparison. Therefore, it can be deduced that there is no improvement in the reading performance of subjects who were not exposed to thematic units instruction.

Table 1: Paired Samples Test for Reading Performance of Control Group

			Pair 1
			PRE TEST-POST TEST
Paired Differences	Mean		-0.84848
	Std. Deviation		14.62045
	Std. Error Mean		2.54509
	95% Confidence Interval of the Difference	Lower	-6.03267
		Upper	4.33570
t			-0.333
df			32
Sig. (2-tailed)			**0.741**

The paired samples tests on the pre and post-test *mean* scores of the experimental group, on the other hand, yielded a significant value of **0.00**. Therefore, it can be concluded that there is marked / significant difference in students' performance in the language skill of reading in the pre and post-test, with the post-test performance exceeding the pre-test performance. Based on the findings, it can be established that thematic units instruction does lead to an improvement in students' reading performance. These findings confirm findings of previous research endeavours. Elley (1991), for example, found that reading coherent extended materials lead to improved language abilities.

Table 2: Paired Samples Tests for Reading Performance of Experimental Group

		Pair 1
		PRE TEST-POST TEST
Paired Differences	Mean	-8.80000
	Std. Deviation	10.79738
	Std. Error Mean	2.15948

	95% Confidence Interval of the Difference	Lower	-13.25694
		Upper	-4.34306
t			-4.075
df			24
Sig. (2-tailed)			**0.000**

Findings on Research Questions 3 and 4

Writing performance of the control group and experimental group was first analysed according to the overall test score using *paired t test*. In general, students in the control group performed better in the post-test than the pre-test. The *mean* for paired differences is –3.39286, indicating a higher score in the post-test (hence, the negative score). Interestingly, the level of overall improvement in the writing performance of the control group is of a significant value of **0.011.**

For the experimental group, it was found that the overall performance and improvement among students was overwhelming and extremely encouraging. Although the entry level of students of the experimental group was lower than that of the control group, they far outdid the control group in terms of degree of improvement. Through the paired samples statistical analysis, it was discovered that students showed a whopping improvement in the *paired differences mean*, i.e. –17.65385. This figure far outweighs the performance of the control group of –3.39286. The degree of improvement in their writing ability yielded a significant value of **0.00**, confirming that students had shown a vast degree of improvement in their writing performance in a matter of ten weeks. This is a very rewarding and encouraging rate of improvement among the subjects of experimentation, proving the efficacy of thematic units instruction.

Table 3: Paired Samples Tests for Writing Performance of Control Group

			Pair 1
			PRE TEST-POST TEST
Paired Differences	Mean		-3.39286
	Std. Deviation		6.61838
	Std. Error Mean		1.25076
	95% Confidence Interval of the Difference	Lower	-5.95920
		Upper	-0.82652

		-2.713
t		27
df		**.011**
Sig. (2-tailed)		

Table 4: Paired Samples Test for Writing Performance of Experimental Group

			Pair 1
			PRE TEST-POST TEST
Paired Differences	Mean		-17.65385
	Std. Deviation		8.87668
	Std. Error Mean		1.74086
	95% Confidence Interval	Lower	-21.23921
	of the Difference	Upper	-14.06848
t			-10.141
df			25
Sig. (2-tailed)			**.000**

To get more insightful information, the breakdown of marks according to elements of task fulfilment and language were analysed to measure the degree of improvement experienced by the participants of the study.

Task fulfilment score

The score for task fulfilment for the control group is seen as encouraging; the *mean* for pre-test is 52.62, with a *standard deviation* of 7.157. In the post-test, there is an increase in the *mean* to 57.62, with 7.08 of *standard deviation*. The paired samples test showed that the control group charted a significant improvement of **0.04** in the area of task fulfilment. The *mean* was -.5.00, with *standard deviation* of 8.44. This was somewhat unexpected but can be rationalised and explained as improvement which came about as a result of the exposure of the control group towards similar types of topics that were presented to the experimental group. The researchers ensured that the students were not marginalised in any way nor deprived of any type of input. The topics were dealt with incidentally; as, when and how they appeared in the textbook in use.

As for the experimental group, the breakdown of the *mean* score clearly demonstrates stark increase in the area of task fulfilment. The *mean* scores for the pre and post-test are 52.05 and 69.74 respectively; the *standard deviations* are 9.84 and 10.492, in respect to the two *mean* scores. In the paired samples test, the results showed the *mean* to be –17.69 and *standard deviation* as 11.07. The high value in the negative value of the *paired mean differences* show that the degree of improvement in task fulfilment is high, with a significant value of **0.00**. Having received continuous input for 10 weeks, students' schemata and worldview of the topics increased and became clearer. They showed the ability to discuss the topic in a more matured fashion, as reflected in the manner they expressed their ideas and opinions. By the end of the thematic units pedagogical treatment, students gained sufficient repertoire of ideas to enable them to respond effectively to a given topic. This was projected through their maturity of thoughts in the treatment of the topic and facts which were illustrated and well-substantiated, adhering to the demands of university students' level of logical, cognitive reasoning in writing. This finding is the improvement among students in the control group certainly does not measure up to the degree and quality of improvement experienced by the experimental group, which is even more significant and vast.

Language score

In terms of language improvement, students of the control group gained lower pre and post-test marks in language. The *mean* score for pre-test is 46.43, with a *standard deviation* of 5.66, while the post-test yielded *mean* score of 48.21 and 5.25 of *standard deviation*. The paired samples test points to show that the degree of improvement in language among students of the control is of a non-significant level, i.e. 0.150. The *mean* score was –1.78 and *standard deviation* was 6.38. Therefore, it is obvious that students who did not go through thematic units instruction witnessed marginal language improvement. For the experimental group, the *mean* for the pre test is recorded at 44.36, with a high *standard deviation* of 10.06. In the post-test, the students' grades recorded the *mean* score of 59.23, with 7.01 as the *standard deviation*. This entails that there is remarkable degree of difference in language score between the two tests. This is proven by the *paired samples mean* of -14.87, with 10.12 of *standard deviation*. The significant value of 0.00 is clear and tangible proof of students' enhancement in language ability. They earned higher marks as a result of their ability in conveying ideas with clarity and possessing lucid style of delivery. This could be attributed to the fact that a vast variety of vocabulary items and language features learnt throughout the units were appropriately learnt, internalised and transferred in their writing texts. Expressions such as "social ills", "nocturnal activities", "lured", "vices", all of which were introduced and drilled repetitively in the unit on *Teenage Issues and Crime in Our Society* were successfully used and intermittently present in their writing. This points to show that students could make a reading-writing connection and could effectively transfer the knowledge they had acquired in learning of the themes through the whole language learning approach. The repetitive, cyclical and spiral process of thematic units instruction certainly enhanced retention and acquisition of language items.

Research Question 5

In order to find out students' engagement in this pedagogical approach, data from focus group interview and the lecturer's classroom observations were analysed. From the focus group interview conducted by the researchers on 6 participants from the experimental group, it was found that all the participants' reactions and responses towards the use of thematic units instruction were in the affirmative. All of them confirmed and supported the use of this pedagogical approach for various reasons.

Since the use of authentic materials is strongly mooted in learning (Widdowson 1996; Nunan 1991), likewise the students appreciated the bringing of the real world into the classroom. The participants opined that the use of authentic materials such as newspaper articles, Internet websites, songs, and letters from the newspaper were relevant to them in and outside class. They felt that they were learning English in a realistic setting as the pedagogy broke free from the drab and mundane style of rote learning and grammar focussed input that they had always associated English lessons with previously. They also commented on the irony of having gone through English classes for so many years, yet not being able to improve their grammar and language ability. This, in their opinion (and they are right) is of no value. One student (of high language ability) admitted that he had thought (before) that improvement in grammar was the essence of language learning but now realised that grammar was the by-improvement and language learning encompassed a host of other elements, like enhancement of general knowledge and input, pertinent to a topic area. The bleak perception towards English only shows how much English lessons had been dreaded, due to the uninteresting, non-motivating and non-innovative teaching approaches adopted by lecturers and teachers, alike. Through thematic units instruction, the students said that they learnt grammar covertly in meaningful contexts, without unduly stressing the importance of grammar per se.

It was well noted by the lecturer that the students remained continuously and consistently engaged in the learning process. To ensure this, students were given a variety of tasks such as group discussions, group projects and presentations, role-plays, jotting of reflections and relating of experiences. All these tasks were readily accepted although the students were mainly of average and low ability. At first, the class seemed reticent and docile but as time passed, they readily opened up to the lecturer, contributed in lessons and class discussions and were more relaxed during language lessons. Although some of the input / materials were of 'heavy' reading, students nevertheless showed interest and enthusiasm in the learning process. For each unit, the lecturer constantly harped on the importance of learning the rudimentary vocabulary items so that they could relate / respond to questions in the four language skills, relevant to the themes. The lecturer's well-meant (huge) doses of advice and practice were taken up by the students who constantly highlighted, underlined, and took note of new vocabulary items they came across, making headway towards self-directed learning.

Another point raised by the subjects was that they benefited immensely in their reading ability as a result of thematic units instruction. Students noted that they could respond better to reading texts which related to topics discussed in class as they could comprehend the subject matter due to the acquisition of rudimentary / relevant vocabulary items invariably present and embedded in any reading texts of the said topic. Their positive admissions confirm and support the finding of the vast degree of language

improvement experienced by the students, as evidenced by the results of the pre and post-tests conducted on them. Lecturer's observations also showed that students could use vocabulary items as well as ideas sufficiently and satisfactorily.

It was also learnt that students not only benefited in terms of linguistic input but also in their general knowledge. Among the three themes discussed in class, the students found the theme of culture to be the most interesting and fulfilling, as they learnt a lot of things about other communities, cultural values, norms and taboos, which they had not known of before or had taken for granted. This would help them in becoming better citizens, with more cultural sensitivity and awareness. As lifelong learning is the core of education, it was learnt that students' were prepared to take the first step towards this by applying the knowledge gained in class and broadening their horizons henceforth. Some students pledged to stretch the learning process by further discovering cultural beliefs and practices of the multi-ethnic groups in Malaysia, as well as being more sensitive and caring towards the environment.

CONCLUSION & RECOMMENDATIONS

In this study, all instruments of data collection have confirmed and triangulated the findings that thematic units instruction, which builds upon previous knowledge in a cumulative, spiral and coherent approach is adept in enhancing students' language ability, when preparing them for the MUET exam, thus ensuring continuous quality advancement in higher education. The experimental group evidently performed better in their reading and writing abilities in comparison to the control group. The paired samples test for reading performance of the experimental group yielded a significant value of **0.00,** while similar test on the writing performance resulted in higher *mean* scores in both components of writing, i.e. task fulfillment and language. Although there is some degree of improvement among students in the control group, it does not measure up to the experimental group since the presentation of the materials was non-cyclical and did not ensure retention of ideas nor vocabulary items. Students also improved in vocabulary development as a result of the inter-connectedness of vocabulary items, built repetitively. The subjects in this study not only improved in the lexical aspect of the language component, but also the structural aspect. The improvement came about as a result of a more focused, meaningful and authentic learning experience. Students not only became more engaged and motivated, but their character was also positively shaped. Thematic units instruction was able to raise students' awareness and consciousness of pertinent issues of nation-building, national integration, caringness and responsibility for the environment. The participants found the pedagogy to have helped them in learning language through the use of authentic materials, meaningful learning contexts, ensured engagement in the learning process, enabled language and knowledge transfer and increased awareness and consciousness of important aspects to ensure lifelong learning. Students showed more engagement in learning even when they were challenged with arduous tasks.

Recommendations are hereby made to reform the pedagogical approaches to preparing students for the MUET exam and to bring about a paradigm shift in the ESL classrooms

in higher education so that the aspired and envisaged educational reforms can materialise in the true sense. In achieving so, thematic units instruction should be strongly advocated to teachers as the way to go. Exposure to this could be done through in-house training, courses, seminars or workshops, and teacher training. Efforts should be made to make resources on thematic units instruction more available through efforts of materials production and resource packs for classroom use. This would take the toll off the teachers, who otherwise, have to source for materials on their own. Planning thematic units should allow for incorporation of a variety of language concepts into topic area that is interesting and worthy of study which gives students a reason to use the language. Teachers / Lecturers should choose themes that lend themselves to teaching language that will be useful for their students. To provide tertiary level students with an opportunity to learn cognitive academic language proficiency (CALP), as well as to provide a less abrupt transition from the ESL class to an all-English-medium academic programme, collaborative efforts between English lecturers and lecturers from other departments could be initiated.

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UTILISATION OF DIFFERENT RESOURCES FOR SELF-DIRECTED LEARNING BY STUDENTS UNDERGOING AN INTEGRATED PROBLEM-BASED MEDICAL CURRICULUM

Mala Maung, Zoraini Wati Abas, Azman Abdullah

ABSTRACT

As the success of self-directed learning depends not only on the learner, but importantly, on the right balance of learning opportunities, utilisation of different resources for self- directed learning was assessed in students undergoing the medical programme at the International Medical University. Utilisation of each resource was correlated with the semesters, students' learning style and their pre-university education. Resources included printed materials, clinical skills (CSU), problem-based learning (PBL), communication with peers, communication with experts, library, museum, laboratory session, assigned independent reading (AIR), structured independent learning online system (SILOS), and online learning interactive system (OLIS). Of the 708 students assessed, 98% and 49% found printed materials and AIR useful for self-directed learning, respectively. While printed material was ranked highest, AIR was ranked lowest by students of all semesters. Only PBL, CSU and OLIS have positive correlation with semester. Utilisation of printed materials was scored highest and AIR lowest irrespective of whether learners were active/reflective, sensing/intuitive, visual/verbal or sequential/global. Students scored printed materials highest and AIR lowest regardless of their pre-university education. Utilisation of other resources was also addressed. Resources relevant to learners' need are highly appreciated and novel resources should ensure sustainability of learner interest and enthusiasm. The results also indicate that the learning environment is conducive for the development of independence and self-reliance in learners. These findings are invaluable in planning resources and if necessary in promoting relevant traits of self-directed learning, and should convey important feedback to learners as well as implementers to further enhance the learning process.

INTRODUCTION

Self-direction and self-directed learning (SDL) have been described by many (1, 2) and the resources which are required to achieve SDL identified (3). Self-directed learning is often linked to lifelong learning and an evidence-based approach to learning (4) Research on SDL have been based on three main themes namely descriptive evidence of planning

by learners, self-directed learning level in the learner and the qualitative methods to address self-direction in learning during adulthood (5).

As the success of self-directed learning does not depend only on the learner, but also to an important extent, on the provision of the right balance of learning opportunities, a survey to determine the utilisation of different resources as a means of self- directed learning, was conducted on students undergoing the medical sciences programme at the International Medical University. The International Medical University (IMU) has implemented an integrated, problem-based learning (PBL) medical curriculum since 1992, when its medical faculty was first founded. The resources which are provided to enhance the learning process, in addition to problem-based learning (PBL), include printed materials, library, clinical skills (CSU), communication with peers, communication with subject matter experts, museum, laboratory session, assigned independent reading (AIR), structured independent learning online system (SILOS) and online learning interactive system (OLIS). AIR, SILOS and OLIS are information technology and computer-assisted learning resources which are provided to compliment the effectiveness of a PBL curriculum (6).

The success of inculcating self-directed learning is dependent, to an important extent, upon provision of adequate learning opportunities. Thus, the variety of learning resources available at the International Medical University are aimed at providing opportunities for self-directed learning in individual or group activities. Nurturing self-directed learning is a delicate process as it may not be successful if learners lack independence and confidence, or if there is a lack in resources (7, 8). Although the implementation of innovative learning resources presents challenges, a continuously evolving learning environment is needed to ensure the continued delivery of high quality medical education in order to address the changing role of medicine and the expectations demanded of physicians.

MATERIALS AND METHODS

Study Population

The study population comprised students attending the phase 1 medical programme (Semesters 1 to 5) of the International Medical University. Participation was wholly voluntary and anonymous. The objectives of the study and the methodology were explained to all participants. The number of students who participated in the study comprised Semester 1, N=181 (92%); Semester 2, N=162 (93%); Semester 3, N=144 (96%), Semester 4, N= 122 (80%) and Semester 5, N= 99 (83%).

Survey

The questionnaire was designed to address particulars of students and the various aspects of SDL. Different researchers have used various measuring tools to elucidate the SDL readiness in and the SDL perception of, learners (2, 9). The questionnaire that was used in this study was constructed so that it would be easy to comprehend, and addressed

issues relating to characteristics of successful self-directed learners, process and benefits of SDL, and resources for SDL.

Innovative Resources

1 Assigned Independent Reading (AIR)

The AIR themes/topics were selected to reflect the learning sessions undertaken during the respective weeks for each semester. More emphasis is placed on the basic medical sciences. The topics are integrated in nature but may be also disciplined-based. A list of printed materials and websites were provided as references for the AIR. Two topics were identified for portfolio assessment pertaining to the AIR session for each course/system. Students undertake the assignments independently and submit the portfolios online.

2 Structured Independent Learning Online System (SILOS)

The Structured Independent Learning Online System (SILOS) is an application of the Virtual Medical University Project. The students utilise this online application to submit AIR portfolios and to participate in weekly formative, self-assessment sessions.

3 Online Learning Interactive System (OLIS)

The Online Learning Interactive System (OLIS) is a virtual learning environment formulated for each course/system. Relevant topics are identified for each system and an individual topic includes objectives, content, references and formative assessment.

RESULTS

Relationship between semester and utilisation of resources

Of the resources provided, on a ranking scale of 1 to 5, printed materials was ranked the highest (mean 4.40), and assigned independent reading (AIR), lowest (2.45) by students of all semesters. Although variations occur between the semesters, the overall usefulness of other resources, in descending order was, library (4.0), clinical skills (CSU) (3.9), communication with peers (3.8), communication with subject matter experts (3.7), museum (3.5), laboratory session (3.3), problem-based learning (PBL) (3.3), structured independent learning online system (SILOS) (3.2) and online learning interactive system (OLIS) (2.9) (Fig. 1). Although PBL, CSU and OLIS have positive correlation with semester, only the correlation between the PBL and semester is significant. The remaining resources have negative correlation with the semester and the correlation coefficient is significant for all except for communication with peers (Figs. 2 - 4).

Relationship between pre-U education and utilisation of resources

The types of pre-university education that the students had experienced were categorized into 3 main groups with other smaller numbers of various types grouped under others. The majority of the students underwent STPM (Malaysian equivalent of matriculation) (N= 110), South Australian matriculation (SAM) (N=152) and GCE : A-level (N= 247). The number of students who had other types of pre-university education was 188.

The utilization of the various resources available at the IMU in relation to the types of pre-university education is shown in Figure (5). Preference for the printed materials as a learning resource was scored highest (mean 4.40) and AIR lowest (2.47) irrespective of pre-university education. The preference, in decreasing value was CSU and library > communication with peers > communication with experts > museum > PBL > laboratory > SILOS > OLIS. The highest scores for utilization of printed materials, library and communication with experts were seen with the SAM students. STPM students scored the highest means for PBL communication with peers, SILOS and OLIS, while the GCE :A-level students scored museum, laboratory and AIR highest. However, the difference in mean was significant between the SAM and GCE: A-level students for the museum, AIR and printed materials.

Relationship between learning style and utilisation of resources

Generally, there were more reflective than active, more sensing than intuitive, more visual than verbal and more sequential than global learners. The mean values for the utilisation of resources in relation to the learning style are shown in Figures (6 – 9).

Correlation of learning style with choice of resources showed that printed materials scored highest (4.4) and AIR lowest (2.5), irrespective of the learning style.

Preference of individual resource for self-directed learning by active learners showed a significant higher mean for communication with experts and peers as compared to reflective learners. (Fig. 6)

Significantly higher means are seen for the museum and printed materials as useful self-directed learning resources with the sensing learners. (Fig. 7).

Visual learners scored significantly higher means for the museum, laboratory and OLIS. Interestingly, visual learners scored a higher mean for communication with experts whereas verbal learners scored a higher mean for printed materials. However they were not significant (Fig. 8).

Global learners rated significantly higher means for laboratory, communication with experts and communication with peers, compared to sequential learners (Fig. 9).

DISCUSSION

The learning resources which are provided at the IMU include problem-based learning (PBL), printed materials, library, museum, communication with peers, communication with subject matter experts, clinical skills (CSU), laboratory session, assigned independent reading (AIR), structured independent learning online system (SILOS) and online learning interactive system (OLIS). The provision of a varied mix of learning resources is to ensure that learners develop the ability to acquire knowledge, skills and attitudes related to self-directed learning through utilization of resources in the form of group activities or as activities for individual learning. Snell has stated that the importance of the right mix of group and individual learning activities to promote self-directed learning (4).

Learners in semester 1 scored high means for the museum, AIR and SILOS. The means gradually decline with the higher semesters. It is perceived that the students have not been exposed to these resources, especially the AIR and SILOS, and thus constitute novel means of learning. The learners may be exhibiting the "honeymoon effect" of a training programme, whereby when experiencing the learning environment for the first time, the learners are full of enthusiasm and expectancy, which after some period of time, the novelty wears off and enthusiasm declines (10). This may also be evident from the results seen with the utilisation of library, communication with peers, communication with subject matter experts and printed materials as resources for self-directed learning which remained relatively constant throughout semesters 1 to 5. Printed materials as a learning resource was scored highest by learners irrespective of semester, learning style or pre-university education. This may reflect the learning method to which the learners have been exposed to prior to their admission to the university environ and the comfort and ease of adaptation towards the resource the learners are used to. These resources may be more "traditional" means of learning and may explain the relative plateau seen with them. This indicates that it is essential to plan, implement and review the resources or mode of delivery in order to sustain the continued interest and enthusiasm of learners.

Resources relevant to the learners' needs are scored high as is seen with the utilisation of laboratory by semester 1 and 2 students. These two semesters have laboratory sessions which are relevant to lectures and other learning activities and thus complement and reinforce the learning process. This is an important feedback to the implementers for the need to plan and conduct relevant laboratory sessions, as appropriate, for other semesters. The utilisation of CSU as learning resource is another example of the importance of relevance and the application of theory to practice in maintaining and promoting motivation in students and for enhancing appreciation of the resource.

Appreciation of PBL as a resource for self-directed learning by the learners increased with advancing semesters. This may be due to the increasing maturity, further

development of confidence and independence, appreciation of the relevance to real-life situations and acquisition of enhanced interpersonal and communication skills. Steinert has stated that the ability to work as a team and learn from other learners rather than from educators and the appreciation of relevance of content to clinical situations enhance the success of PBL as a resource for self-directed learning (11). PBL as a resource for self-directed learning fosters positive traits, such as responsibility to self and others, the ability to work as a member of a team and as an individual, emotional and social maturity, and communication and interpersonal skills (12). As the learners mature, these positive traits would have contributed towards the development of adult learning skills, whereby they are able to assess and appreciate their acquisition of knowledge and skills in relation to other learners (13).

AIR was perceived by some as rigid and that the online submission of portfolios time consuming as the network was, at times not user friendly. However the majority agreed that the topics were useful in providing added information. It may be more receptive if the learners are given a framework of topics based on a particular theme from within which the learners choose. This may motivate them as they are involved in making their own decision in choosing a learning topic (14). Submission of portfolios relating to AIR is a requisite and its aim is to guide students towards reflecting on what has been learnt and to enable them to summarise and evaluate the information and knowledge acquired in relation to the outcomes of the IMU. This is to enable students to develop decision making, critical thinking and self-reflecting skills, and the ability to use these traits on their own.

SILOS is a learning resource aimed at promoting the habit of inquiring and self-reflection. It permits self-assessment and serve as a monitoring system for the learner to evaluate oneself and to reinforce the areas of need or deficiency. SILOS assessment and the submission of portfolio also serve as a monitoring system for the educators. Monitoring of the utilization of resources is invaluable as without some type of monitoring, learners' commitment to the learning resources may not be regular (15). In addition, there may be a need to increase learners' awareness that AIR, SILOS and OLIS are information technology and computer-assisted learning resources which have been provided to enhance the effectiveness of a PBL curriculum as stated by Jones et al (6), and that acquisition of IT skills will reinforce their information searching, gathering and retrieval skills (4). Moreover, learners may be more motivated and committed if they are made aware that they play a crucial role in contributing towards the development of their learning environment through their feedback (16)

It can be seen that the learners became increasingly self-reliant and independent of subject experts as they progress through the semesters. These traits may be due to the developing maturity of learners and the acquisition of lived experiences which may be attributable to the influences of the learning environment to which they have been exposed.

The formal learning environment is crucial for nurturing self-directed learning as self-direction develops in stages and implementers should ensure that the environ is relevant and supportive in relation to the individual stages (17). In addition to the formal learning activities, the family background and cultural factors of the learner should also be taken

into consideration when interpreting the success or failure of self-directed learning, as these can influence to an important extent, the motivation and commitent of learners. Das Carlo et al stated that the students' background might influence motivational and cognitive factors that can determine the outcome of group-learning (12). In agreement to this, is the statement that certain family attitudes and practices may be created to encourage self-directed learning. Encouragement and support of self-directed activity, discussions, and creation of a rich home learning environment are some of the techniques mentioned (18).

CONCLUSION

This study highlighted the importance of providing a variety of learning resources for the development of self-direction, independence and self-reliance in learners and for the acquisition of self-directed leaning skills. Learners exhibited positive traits of enthusiasm and motivation as they enter the university learning environ. These traits were also seen when they were undertaking novel learning methods. Thus implementers must be aware that it is imperative that the learning environment and the resources are supportive to sustain and further enhance these positive traits. It is equally important to bear in mind that resources which are relevant to the learner's need, which have practical applications and which can be related to clinical experiences are highly appreciated for self-directed learning.

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SURVEY OF LEADERSHIP AND RELATED SKILLS DEVELOPMENT IN THE THAI MBA PROGRAMS

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ABSTRACT

The MBA degree is generally regarded in Thailand's corporate sector as an important requirement for promotion to higher ranks of the business world. Accordingly many staff with bachelors qualification from this sector aspire to complete this Masters level qualification. Indeed what are the motivations of MBA entrants in undertaking this program? This is one of the issues addressed in this study. Another somewhat related consideration is the development of leadership skills in the MBA program. Presumably one of the important aspect of climbing the ladder of corporate success is the aim of the white collar graduate staff to become captains of industry or at the very least leaders of management units therein. This raises another important issue for MBA academics and indeed universities offering such a program, in particular, what leadership skills are being developed in the MBA for students enrolled in that program? An institutional research project was undertaken within the Thai universities located in Bangkok to explore these issues with current MBA enrolled students. It is hoped that the study will provide decision support to university and academic managers in their quest to improve the MBA program offered by the Universities. However, the study could be of broader interest as their appears to be a dearth of such projects undertaken in the past within the Asia Pacific region.

INTRODUCTION

Within the Northern American context, institutional researchers make a very valuable contribution to program assessment and reviews. Often the American institutional research office provides information and procedural coordination to support a university's review process. Reviews or "assessments" can focus at different organisational levels including individual programs, academic organisational units or university-wide processes. In other countries/regions often the institutional researchers may only play a marginal role in program reviews as other senior officers such as "Registrars" and others may dominate the process working with Academic Boards and the like. Nevertheless even in such countries the institutional researchers would normally provide information/ decision support to other administrative units that coordinate the program review processes.

Data for program reviews and the like can emanate from institutional data bases such as the enrolment files and processes or they may be gathered through student and other stakeholders surveys or other data gathering mechanisms. In Thailand the surveys are regarded as particularly important to provide feedback to institutions on the strengths and weaknesses of their programs.

It is in this context that a survey was undertaken in Thailand to gather some institutional research inputs into the MBA program. In particular the Thai Universities MBA survey was undertaken with the following objectives:

? Student motivation for enrolling in the MBA program.
? Development of leadership and related skills in this Masters program.

The universities in this case study are Government and private institutions in Thailand that have historically provided the first Master Degree on Business programs. The MBA is particularly important to these universities as it generates much income that can be used to cross-subsidise other programs such as Engineering that tends to be more expensive to operate in terms of staffing and other resources.

RESEARCH METHODOLOGY

A survey instrument was designed to address the questions raised previously concerning the MBA program and student perception of the importance and achievement of leadership and related skills. The questionnaire was constructed based on studies previously undertaken, particularly in the United States of America and as available from the literature. The questions were translated into Thai and piloted with a few MBA students from the case study university. Largely, the pilot indicated that the questions were appropriate for the case study environment and could be relatively easily comprehended. Nevertheless, some minor changes were made to the survey questionnaire prior to implementing within the Thai universities.

The survey questionnaire was distributed to the students drawn from the MBA program of the Thai Universities by using cluster sampling. They include one Government University and one Private University. A total of 56 questionnaires were returned; this may be considered to be a relatively small sample size, however, within the Thai context where there is great resistance by students and also the academic staffs to participate in such surveys, the researchers believe that the MBA students' response is reasonable. Further, given that such research has not been undertaken in Thailand before, to the best of our knowledge, the study should be considered as hypotheses generating and hence a relatively small sample size is considered adequate, under the circumstances.

LITERATURE REVIEW

The University of Wisconsin –La Crosse (2003) sets out a number of learning outcomes from its MBA qualification including comprehensive knowledge of the functional areas, problem solving capabilities, global perspective, communication competency, ability to manage information, social responsibility and behavioral skills. Importantly, the latter

encompasses the ability to utilise leadership skills effectively. However, no indication is given as to how such skill developments are monitored and indeed measured in terms of achievement.

At the Iowa State University (McElroy, 2002) a survey of Business undergraduates Alumni is undertaken to inter alia examine perceptions of skills development. In order to place the Alumni survey into context, the results are compared with the annual survey of graduating students. The paper notes that the University is doing particularly good job at developing teamwork skills and an appreciation of the role of Technology. Further, McElroy (2002) suggests that Alumni tend to rate their skills development more consistently at a higher-level than was the case with graduating senior students.

Wan and Fahrenwald (2004) report on a survey of current MBA students at Rockford College with a focus, inter alia, on satisfaction with the program and personal development in the courses. Some of the key findings of the study include:

- Overall the students were very satisfied with Professors and education they receive.
- Majority of the students were satisfied with their performance in the MBA program.
- Since 82 percent of the students were full-time employees, they were interested in alternative schedules such as Saturday morning class, early morning class and compressed schedules.

Bennis (http://www.nwlink.com/~donclark/leader/leadcon.html) believes that good leaders are made and not born. He suggests that if one desires and has the willpower, they can become an effective leader. This author notes that good leaders develop through a never ending process of self-study, education, training and experience. Leadership is defined as a complex process by which a person influences others to accomplish a mission, task, or objective and directs the organisation in a way that makes it more cohesive and coherent.

The Management and Leadership Council (2002) indicate that the shortage of appropriate and practical leadership skills is currently holding back the UK's economic performance. Their study found that despite a rapid expansion of formal management education in the past 20 years in the UK, leadership skills are often in short supply from the top to the bottom of organisations. The council's study notes that the most marked shortages of management and leadership skills were in strategic thinking, communication, leading means motivating people, and developing and promoting cultural and ethical standards. This clearly provides a firm rationale for the current study that aims to survey leadership and related skills development within the MBA program of the Thai Universities.

SURVEY OF THAI MBA STUDENTS

Demographic characteristics of Thai survey respondents

Table 1 below specifies the demographic and related characteristics of the MBA responding students permitting the following observations:

- Women are on top, as far as MBA responding students are concerned and indeed the observed percentage reflects the female dominance of Thai higher education (as indeed is the case overall in Australia).
- Over 90% of the responding students were below 31 years of age, reflecting the general situation in Thailand that normally Bachelors graduates tend to move onto part time MBA programs shortly after securing a position in industry, if they are to move up the corporate ladder.
- Slightly greater than 90% of the respondents are drawn from the private sector with the SME private firms being dominant.
- Around 50% of the MBA students supervise up to 10 employees with just greater than 40% not sustaining any staff supervision responsibilities in their current post.
- Just less than 60% of the MBA students have worked in the current Company for less than 3 years.
- On the other hand just less than 35% of respondents had worked for at least five years in all former employment positions.
- As expected for a Master's program the vast majority of respondents had completed a Bachelor program previously.
- Again not unexpectedly, the vast majority of respondents are drawn from the broader discipline category of Business, Administration and Law.

Table 1: Demographic and Related Characteristics of Respondents

Characteristic	Frequency	Relative Frequency (%)
Gender		
- Male	25	44.6
- Female	31	55.4
Age		
- <= 25 Years	23	41.1
- 26 to 30 years	28	50.0
- 31 to 35 years	3	5.4
- 36 to 40 years	1	1.8
- 41 to 45 years	1	1.8
Employer		
- Large Private	18	35.3
- SME Private	28	54.9
- Large Public	2	3.9
- SME Public	3	5.9
No of Staff Reporting		
- None	21	40.4

Characteristic	Frequency	Relative Frequency (%)
- 1 to 5	24	46.2
- 6 to 10	2	3.8
- 11 to 15	1	1.9
- 16 to 20	2	3.8
- >25	2	3.8
Employment duration in Current Firm		
- < 1 year	4	8
- 1 to 2 years	7	14
- 2 to 3 years	18	36
- 3 to 4 years	6	12
- 4 to 5 years	7	14
- > 5 years	8	16
Total Employment Duration		
- < 1 year	1	1.9
- 1 to 2 years	4	7.7
- 2 to 3 years	11	21.2
- 3 to 4 years	10	19.2
- 4 to 5 years	8	15.4
- > 5 years	18	34.6
Highest Prior Qualification		
- Bachelor	46	82.1
- Master	7	12.5
- Other	3	5.4
UG Discipline		
- Hum & Soc Sc	6	10.7
- Engineering	7	12.5
- Bus & Admin	20	35.7
- Applied Sc	4	7.1
- Economics	3	5.4
- Accounting	2	3.6
- Law	14	25.0

Reasons for Studying MBA

Table 2 below provides the MBA students responses to the program and related dimensions that attracted the students to the University for their MBA degree using a five point Likert scale (1= strongly disagree and 5= strongly agree). The following observations are made on the data contained in this table:

- The most important reason for selecting the particular MBA program was to upgrade their current qualification so as to improve their future employment prospects. Clearly the opportunity to raising the career status was more important than the four Ps of marketing.

- Importantly the second highest factor drawing the students to the MBA course was the need to acquire good leadership knowledge and skills. So one of the Marketing Ps, namely, the product, did play a key role in the student MBA enrolment.
- The third most important factor for the MBA program selection was the respondents' viewpoint that acquisition of the master's qualification would be essential to enhance their status in the business community- possibly another vote for the product in marketing terms.
- The least important factor for the MBA degree enrolment was to attain increased knowledge and skills rather than simply the qualification.
- In terms of the four Ps of marketing, as previously stated Product was the key factor in terms of selection of the particular MBA degree, with Promotion ranked number two, Place being third and Price being last.

Table 2 : Reason for Selecting the MBA Degree

Reason	Mean	Standard Deviation
Convenient Location	3.77	0.99
Reasonable Cost	3.41	0.85
Meets vocational needs	3.93	0.78
Improve future employment prospects	4.38	0.65
Need good leadership knowledge & skills	4.34	0.79
To enhance status in business community	4.02	0.73
Excellent quality of MBA	3.86	0.70
Effective promotion of program	3.84	0.63
Increasing knowledge & skills more important than degree	2.80	1.23

The mean values contained in Table 2 were cross-tabulated against some of the previously mentioned demographic characteristics of the MBA students yielding the following statistically significant results:

- Gender does not appear to be an important variable for the selection of the MBA degree with one exception, namely, female students (mean agreement= 3.10) were more likely to agree that attaining increased knowledge and skills through the MBA program was more important than the degree itself in comparison to male students (2.44, $t=2.05$, $p<0.05$).
- Similarly holding a bachelor or master's degree makes no difference to the rationale for the selection of the MBA program.

MBA Degree and Leadership Qualities and Skills

The MBA student respondents were requested to provide the degree to which certain knowledge and skills were developed prior to commencing their studies and after one year studying in the MBA program. Table 3 below summarises the mean and standard deviation of the student responses related to the development of knowledge and skills on a five point Likert scale (ranging from 1= very low and 5= very high) prior to commencing their MBA program. The data contained in Table 3 suggests that the various leadership and related skills were not all that developed in the MBA students prior to the commencement of the programs. Indeed the most highly developed knowledge and skills at this stage include "being trustworthy", "being able to laugh at themselves" and "sound communication skills". All other skills and knowledge were scored close to or below the mid-point of the range (3). Interestingly 'ability to articulate the future in simple language" was ranked the lowest in terms of the students' prior knowledge and skills related to leadership.

Table 3: Perceptions of MBA students' Leadership qualities at commencement of MBA

Item	Mean	Standard Deviation
Ability to articulate the future in clear simple language.	2.71	0.624
Understand what motivates others	2.82	0.789
High emotional intelligence	3.14	0.903
Empower others	2.96	0.868
Trustworthy	3.6	0.735
Be willing to take risks	2.91	0.745
Be capable of focusing & following through	3.07	0.85
Be able to laugh at themselves	3.55	0.807
Have sound communication skills	3.36	0.841
Be capable of selecting a good team	3.09	0.646
Be able to build enthusiasm in work team	3	0.694
Be very successful in getting & giving information	2.98	0.618

Item	Mean	Standard Deviation
Understanding organisational needs and characteristics.	2.95	0.724
Controlling the organisation	2.8	0.779
Counselling staff	3.07	0.806
Setting the example	2.91	0.815
Representing the organisation	3.05	0.616
Understanding & knowing about the organization's resources.	3.14	0.645
Sharing leadership	2.98	0.556
Be able to assess organisational progress towards strategic goals	3.02	0.674
Promoting lifelong learning within the organization.	2.89	0.705

The data contained in Table 3 were cross-tabulated against demographic and related variables yielding the following statistically significant findings:

- ? Male MBA students (mean= 3.44) scored higher on emotional intelligence than was the situation with female students (2.90, t= 2.30, $p<0.05$).
- ? Similarly male students believe that prior to commencing the MBA (mean=3.36) they sustained greater capability of focusing and following through than was the perception of female students (2.84, t=2.38, $p<0.05$).
- ? Male students again scored higher on the capacity of counselling staff (Mean=3.36) than was evident from the female perception (2.84, t=2.52, $p<0.05$).
- ? Students with prior Masters Qualification (mean=3.57) expressed greater capability of selecting a good team prior to commencing the MBA than was the case Bachelors graduates (3.02, t=2.21, $p<0.05$).
- ? Similarly the better qualified Masters Graduates (Mean= 3.57) scored higher on the capability of controlling the organisation than their counterparts holding undergraduate qualifications (2.67, t= 2.99, $p<0.01$).
- ? At the same time the higher qualified Masters graduates (mean= 3.71) expressed greater confidence in counselling staff than their undergraduate counterparts (2.98, t=2.28, $p<0.05$).

Table 4 presents the similar data to Table 3 above but in respect of the MBA Students' perceptions of their knowledge and skills one year after joining the MBA program. Table 4 indicates that one year after the undertaking of the MBA programs, the top three knowledge and skills include "having sound communication skills", "being trustworthy" and 'be capable of setting the example". However, the bottom three knowledge and skills include "be willing to take risks", "the skill to understand what motivates others" and "be able to empower others". Comparison of the data contained in Tables 3 and 4 permit the following observations:

- ? Overall the MBA program boosted the students' confidence in their knowledge and skills from a mean of 3.05 to 3.75 or a gain of greater than 23%.
- ? It is noted that the knowledge and skills given the greatest boost by the MBA program include "the ability to articulate the future in simple language" (+37%), "be capable of setting the example" (+33%), and "be capable of controlling the organisation" (+31%).
- ? A couple of knowledge and skills grew to a smaller degree include "be able to laugh at oneself" (+4%) and "be trustworthy" (+10%), however, it is noted that these two skills were already relatively highly developed prior to commencing the MBA degree.

Table 4: Perceptions of MBA students' Leadership qualities one year after commencement of MBA

Item	Mean	Standard Deviation
Ability to articulate the future in clear simple language.	3.70	0.537
Understand what motivates others	3.61	0.802
High emotional intelligence	3.82	0.765
Empower others	3.63	0.896
Trustworthy	3.96	0.719
Be willing to take risks	3.59	0.781
Be capable of focusing & following through	3.73	0.726
Be able to laugh at themselves	3.68	0.765

Item	Mean	Standard Deviation
Have sound communication skills	3.98	0.646
Be capable of selecting a good team	3.69	0.635
Be able to build enthusiasm in work team	3.65	0.7
Be very successful in getting & giving information	3.82	0.69
Understanding organisational needs and characteristics	3.86	0.672
Controlling the organisation	3.67	0.862
Counselling staff	3.80	0.84
Setting the example	3.86	0.724
Representing the organisation	3.79	0.731
Understanding & knowing about the organization's resources	3.80	0.749
Sharing leadership	3.64	0.796
Be able to assess organisational progress towards strategic goals	3.84	0.682
Promoting lifelong learning within the organization.	3.70	0.784

The data contained in Table 4 was cross-tabulated against demographic and related variables yielding the following statistically significant results:

- ? In terms of gender, no statistically significant results are noted.
- ? Nevertheless some statistically significant differences are noted regarding prior highest qualification. In particular, students entering the MBA program with a Masters level qualification were more likely to believe that they were capable of controlling the organisation (Mean = 4.29) than students with Bachelors' Qualification (3.58, $t=2.04, p<0.05$). Similarly Masters' Graduates (Mean= 4.43) appear to be more capable of understanding and knowing about the organisation's resources one year after commencing the MBA degree than was the case with students with an undergraduate qualification (3.74, $t= 2.35, p<0.05$).

Correlation Analysis

Correlation analysis was undertaken between the factors considered prior to enrolment in the MBA program yielding the following statistically significant outcomes:

- Importantly the acquisition of good leadership knowledge and skills was strongly positively correlated with the students' perceived need to upgrade their Bachelors' qualification in order to improve the students' employment prospects ($r=0.46$, $p<0.01$) and where students believed that the MBA program was effectively promoted to prospective students ($r=0.37$, $p<0.01$).
- However, by far the highest positive correlation is noted between the effective promotion of the MBA program and the perception that the University's MBA program was of the excellent quality ($r=0.74$, $p<0.01$). Is it the case that the quality of the product tends to promote itself?

Correlation analysis was also undertaken of the various leadership qualities perceived by the MBA students, once they have been in the program for around one year. Numerous highly positive correlations were noted, however, the highest pair wise correlations were as follows:

- The ability to articulate the future in clear simple language sustained the highest Pearsonian correlation with being successful in getting and giving information ($r=0.49$, $p<0.001$).
- The skill to understand what motivates others was highly correlated with being able to empower others ($r=0.69$, $p<0.001$).
- Possess high emotional intelligence was strongly and again positively correlated with being trustworthy ($r=0.46$, $p<0.001$).
- Being trustworthy sustained the highest correlation with having sound communication skills ($r=0.57$, $p<0.001$).
- Be willing to take risks was correlated strongly with assessing organisational progress towards achieving strategic goals ($r=0.52$, $p<0.001$).
- The capacity to be focused and following through was positively correlated with the capability to set the example ($r=0.62$, $p<0.001$).
- Being able to laugh at oneself was strongly correlated with high emotional intelligence ($r=0.43$, $p<0.01$).
- Having sound communication skills was strongly positively correlated with the capacity of representing the organisation effectively ($r=0.64$, $p<0.001$).
- Be capable of selecting a good team was correlated with being able to share leadership ($r=0.59$, $p<0.001$).
- The capacity to build enthusiasm in the working team was strongly correlated with the capacity to select a good team ($r=0.51$, $p<0.001$).
- Being successful in getting and giving information was correlated with the capability of understanding organisational needs and characteristics ($r=0.53$, $p<0.001$).

- Be capable of understanding organisational needs and characteristics was correlated with capacity of representing the organisation effectively ($r=0.60$, $p<0.001$).
- The capability of controlling the organisation was strongly correlated with the capacity to select a good team ($r= 0.49$, $p<0.001$).
- Being capable of counselling staff was correlated with the ability to empower others ($r=0.57$, $p<0.001$).
- The capacity to set the example was strongly correlated with the capability of representing the organisation effectively ($r=0.66$, $p<0.001$).
- Be capable of understanding and knowing about the organisational resources was correlated with the willingness to take risks ($r=0.64$, $p<0.001$).
- Being able to assess organisational progress towards achieving strategic goals was strongly positively correlated with the capacity to understand organisational needs and characteristics ($r= 0.58$, $p<0.001$).
- Being able to promote lifelong learning within the organisation is correlated with the ability to empower others ($r=0.63$, $p<0.001$).

Qualitative Student Observations

The study investigated the reasons of the students' decision for selecting to study in MBA discipline rather than other disciplines. The students proposed the following reasons:

- Requiring the knowledge for running their own businesses in the future.
- Adopting the knowledge into their daily life.
- Increasing their potential in performing work.
- Increasing work efficiency.
- Attaining extensive knowledge and new experience.
- Generate connection among the students that come from various business areas and various careers.
- Developing thinking concept and be capable to understand business fundamental and apply to their career.
- Desiring to enhance their knowledge into other business functions and management functions and get deeply involve in business.
- Require the knowledge and skill specializes on human resource management for practical application.
- It is the discipline that link directly with their present jobs.
- MBA programs use a number of academic departments.
- Developing self knowledge.
- Create analysis skill and conceptual skill.
- Favor in this area and desire to study in this discipline.
- Easy to apply knowledge gained to their tasks.
- Generating self development and career advancement.
- Requiring other skills beyond undergraduate areas.
- Extending point of view.
- This discipline facilitates their status in the workplace.

- Get bored by so much available time.
- Need to have professional update.
- Need to study for business advancement.
- Capable of applying the undergraduate knowledge to MBA study.
- Enlarge business opportunity.
- Wishing to start their own business.
- Interested in this discipline.
- Desire to change their attitude.
- University being close to their residence.
- Easy to find jobs with the MBA degree.
- Qualification improvement.
- Recommendation from friends.

In conclusion, the MBA students proposed the reasons for their decision to selecting the MBA discipline on requiring advancing their knowledge, competency, skill and potential to perform their job or their own businesses including attitude and viewpoint adjustment as MBA provides specialization in many management functions and many universities have the MBA program for their convenience.

The study also examined the strengths of MBA program in Thai universities. The students recommended the main strengths of MBA program presented in Thai Universities as follows:

1. The institution and administration

- The reputation of the institution and long term experience in MBA and long run educational operation.
- The reputation of academic strength of the institution.
- High Quality
- The good recognition from business sector and Government sector.
- Good environment that support the study climate.
- Sufficient facilities.
- Convenience to go to this university.

2. The Curriculum

- Condensed context and suitable for application to the students' workplace
- Appropriate Curriculum design.
- Provide many interesting departments.
- Multiple choices of elective subjects
- Superior encouragement to the students to be enthusiastic.
- New multiple perspectives pursued in the learning process.
- The teaching method that focus on students' participation.
- Providing E Commerce.
- Presenting the popular worldwide curriculum.
- In-depth in specialised areas
- Emphasize on application.

? Apply the knowledge in many areas of works.

3. The Academic Staff

? The lecturers with high competency and talents.
? Efficient lecturers
? The lecturers with the expertise.
? The lecturers with diverse famous foreign universities background.
? Excellent Selection of guest lecturers with long term experience.
? Good competency in translating the knowledge.

4. The students

? High proportion of smart students.
? The good reputation of the high quality graduates.
? Multi professional students from various businesses.

In conclusion the MBA students recommended the main strengths of MBA program regarding the institution and the administration of that course include the high quality since the institution has long term experience and the recognition by the Government and business sector provide the reputation. Besides, sufficient facilities and convenient location and good environment play the major role as well. Concerning the curriculum, the MBA students proposed the strengths to include the proper worldwide standard curriculum in depth in various specialised areas with condensed context, multiple perspectives, and focus on participation and application and new method of learning. Regarding the academic staff, the MBA students suggested the strengths of the existing MBA program to include providing high qualifications and high competency with long term experienced lecturers. The other factors that composed the strength of MBA program are the multi professional background of the present students and the success of the graduates that can guarantee the quality of the program.

The study captured the perceived weaknesses of MBA program of Thai universities. The students suggested the main weaknesses of MBA program present in Thai Universities as follows:

1. The institution and the administration

? Small size of campus.
? Remote location of the university.
? Insufficient parking area.
? The total number of the students is not very high and there are not many classes whilst some respondents complained that there are so many students in each class.
? High rate of fees.
? The quality of teaching and administration are not consistent with the high fees charged for the MBA.

2. The Curriculum

? The learning period of each semester is too short.

- The learning hours are restricted from Monday to Friday.
- More accumulated credit or too much subjects to take than other universities meaning that longer study period was required.
- Inappropriate class schedule making it difficult for students to come to the class regularly.
- Some universities provide only evening class with day time class being unavailable.
- Too many assignments meaning that students were incapable of completing them on time.
- Some interesting and important subjects missing from the curriculum whilst some subjects seem to be unnecessary.
- There are so many MBA graduates in the labor force.
- Some workplaces in Thailand still discredit Private universities' graduates.

3. The Academic Staff

- Some lecturers do not posses post-graduate qualifications.

In conclusion the MBA students suggested that the main weaknesses of the MBA program regarding the institution and the administration are inappropriate small campus size and distant location, inappropriate high fees rate, and inappropriate number of the students in the class. Concerning the curriculum, the students recommended the weaknesses on inappropriate class schedule, short length of each semester, too many subjects to take causing higher expenditure and taking longer time to finish the course, too many assignments and substandard in quality reputation for Private universities compare to Government universities and with the abundant supply of labor force with MBA degree. Regarding the academic staff the students felt that some lecturers do not posses high qualification as one of the weakness of MBA program.

The study considered the students' recommendations about how the MBA program of their university could be improved in the future. The MBA students commented as follows:

1. The institution and the administration

- The university has to be more modern in various areas and should utilize more technology.
- Better organizing of the campus facilities such as the sufficient parking area, study supporting tools, the study rooms or the library.
- Expand the sub-campus to downtown.
- Lower the fees rate.
- The library for postgraduates should provide a larger number of resources and an increasing number of the computers to searching the database.
- Use the renovation concept.
- Selecting the support staff with more qualifications to deal with the students' issues.

2. The Curriculum

- Require less cumulative credits of the subjects being taken through the whole course. This is due to the longer period of learning than other universities. The whole course should take two years maximum. However some students complained about not enough period of time for study.
- Improve the context of some subjects.
- Update the curriculum consistent to the external environment and the situation.
- Appropriately modify the class timetable.
- Accurately organizing the quota for some subjects that limit the number of the students registered in the courses.
- Organizing the number and the priority of the subjects in each semester consistent with the students' preferences.
- Provide more subjects in selective categories.
- Increase outside study such as visiting the factory or various business companies.
- Focus on practical study such as performing the real project of case study.
- Emphasize more English usage in the program.

3. The Academic Staff

- Improve the teaching method of some subjects.
- The advisor is unavailable to meet in their office.
- Should place less importance on the exam paper but emphasize the practical issues.
- Improve the professional image of the lecturers.
- Focus on more application.
- Improve the lecture time and preparation for the class.

In conclusion, the MBA students require the future MBA program to consider the renovation concept for the institution and the administration in organizing the facilities, the technology, the fees structure and the supporting system. Regarding the curriculum, the MBA students require appropriate adjustment of the following: the number and the priority of the whole subjects taken in the course, the context of the subjects including English language usage, outside study and setting the quota of limited number of the students in each subject. Concerning the academic staff, the MBA students require the academic staff should consider the amendment of teaching time and advisory time, the teaching method that focus on more application and fostering the staff practice and the professional image of academics.

CONCLUSIONS

One of the interesting findings of the study is that the MBA program appears to have rectified any prior gender differences in terms of knowledge and skills of the Thai students. In particular, prior to commencing the MBA degree the male students scored significantly higher on three of the skills, however, one year after commencing this Masters' program no significant gender differences were noted. Clearly this is suggesting that the MBA is indeed bestowing leadership and other organizational skills without any

gender discrimination. This development of greater confidence in women's perception of their knowledge and skills is important in the Thai society where in general men tend to dominate in terms of the cultural positioning of the genders.

On the other hand prior higher University qualifications tend to provide an edge in terms of knowledge and skills to the better qualified Masters' graduates even one year after commencing the MBA program. In particular such students appear to out-perform undergraduates in terms of the capabilities of controlling the organization and understanding and knowing about the organisation's resources. Could this be simply due to the "wisdom" that comes with age and greater life and organizational experiences of the older Masters' Graduates or alternatively emanating from their superior qualifications? This hypothesis requires further research to resolve it.

The pre and post MBA study of knowledge and skills indicates very significant gains in virtually every dimension examined. More importantly strategically important leadership areas such as the capacity to articulate the future, controlling the organisation and being capable of setting the example- all very important leadership skills - grew by more than 30% in the estimation of the students themselves and after being in the MBA program for one year. Clearly the program is adding very significant value to the students' knowledge and skills, making it worth their while to undertake this postgraduate program. Nevertheless a couple of the areas are still not well-developed for the Thai students judging from the mean scores, including the willingness to take risks and the skill to understand what motivates others. The former is particularly important in the fostering of future entrepreneurs from the MBA degree. This constitutes a deficiency in the program and hopefully shall be addressed by the academic staff in the future, given this feedback. Indeed this represents the real value that institutional research can add to the continuous improvement of the quality of the University programs by providing frontline academic staff with the feedback they require regarding any perceived deficiencies in their programs or teaching and learning.

Other findings in the study relate to the reasons for the students' decision in selecting to study in MBA discipline rather than other disciplines. Growth and advancement in their management skills in performing their job or their business opportunity play important role. This is due to the MBA discipline reflecting the grounded knowledge that is capable of being applied to many jobs. Another finding in the study relate to the main strengths of MBA programs that include the long term experience of the universities that can organize the high quality MBA course along with providing sufficient facilities as the high fee course could offer, and the modern method of learning and careful selection of high qualifications of academic staffs, good reputation of the success of the alumni and making new friendship with the multi professional classmates. The findings of the weaknesses of the MBA programs are the unsuitability of curriculum setting, the number of the subjects, class schedule, fees rate, the number of assignments, the qualifications of some academic staffs and the perceived quality standard of Private Universities. The findings of the study regarding the students' recommendations about how the MBA program of these universities can be improved in the future include requiring the

modification of university including the facilities, the technology, the fees, the subjects, the teaching method and the role of the academic staffs.

Given the importance of the development of knowledge and skills and the University's contribution to the emergence of future leaders of industry, further on-going research into this area of institutional research would appear to recommend itself, particularly given the dearth of previous research into the topic. This particular research examined the growth in students' skills and knowledge one year after the commencement of the MBA degree; however, further investigation is required on the subject at the conclusion of the program and post-graduation to fathom not only the inculcation of the skills but also how effectively they are being applied in the world of work.

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THE DEVELOPMENT AND VALIDATION OF AN ELECTRONICS LABORATORY ENVIRONMENT INVENTORY AND ATTITUDE TOWARDS ELECTRONICS QUESTIONNAIRE IN INDONESIA

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ABSTRACT

The objectives of the study were to develop and validate an actual and preferred form of the Electronics Laboratory Environment Inventory (ELEI) and the Attitude Towards Electronics Questionnaire (ATEQ). Data were compiled by library research and field research. Library research wad done by studying and modifying the Science Laboratory Environment Inventory (SLEI) and Computer Laboratory Environment Inventory (CLEI) into Electronics Laboratory Environment Inventory (ELEI), that was combined with Attitude Towards Electronics Questionnaire (ATEQ) into 63 item questions distributed to students, laboratory assistants, and a group of alumni as respondents. There were 353 respondents from Bina Nusantara University. The five scales measured Student Cohesiveness, Open-endedness, Integration, Technology Adequacy, and Laboratory Availability. The results showed that all five scales have a reasonable alpha reliability with low mean correlations. The paper discovered that, the development of the ELEI and ATEQ have been shown to have acceptable reliability and discriminant validity in this study. The instruments, ELEI and ATEQ, are now available to researchers and lecturers, and should prove useful in the design and implementation of the laboratory component of a course.

INTRODUCTION

The study described in the thesis focused on Indonesian university electronics laboratories and their effectiveness as learning environments. Most university electronics courses in Indonesia have a practical aim, directed at enabling student to solve problems which are applicable to real-world applications using electronics systems. Electronics laboratory classes are provided in Indonesian universities so that students have the opportunity of gaining practical skills. These laboratory classes account for between one third and one half of the time scheduled for electronics courses.

Bowles (1970) stated that within schools input factors can be divided into internal input and external input. Internal inputs include such aspects, those are teachers, principals, equipment, and facilities. Whereas external inputs are parental expectations, the time parents spend helping their children to study, and the social welfare of the parents. Windham and Chapman (1990) later commented that input factors such as students, teachers, the school, instructional material, and equipment and facilities are characteristics that influence the output of teaching. In this regard, the electronics

laboratory has a big role in providing equipment and facilities so that students can have practical experiences with an electronics system.

Similarly, Walberg (1984) analysed national and international data banks and identified nine factors which correlate with achievement and attitudes of students. These productivity factors were ability, age, motivation, amount and quality of instruction, home and classroom environment, peer influence, and effects of mass media. The factors can be categorised into three broad headings namely, student aptitude, instruction, and environment. The present study was undertaken to examine the nature and impact of two factors of learning productivity, namely, the laboratory learning environment and students' attitude towards electronics, on the cognitive and affective outcomes of Computer Engineering students at Bina Nusantara University. This university is an information technology-based institution of higher learning in Indonesia.

BACKGROUND OF STUDY

For many years educational environments have been a focus for academic research. According to Fraser (1984) there are some questions about the effects of a classroom's environment on student learning and attitudes, therefore the effects of a school's environment on teacher's job satisfaction and effectiveness, the effect of a new teaching method or curriculum on a classroom's environment, and the determinants of classroom and school environments. Over the past 40 years those issues have been the focus of the research activities, especially into educational environments topics (Fraser, 1994, 1998a). The research having topic learning environments has involved many questions which are of interest to teachers, educational researchers, curriculum developers and policy makers in education. During this period, several approaches have been used in conducting research in the field of learning environments. The exploratory nature of the present study lends itself to the use of questionnaire data that are analysed to investigate associations between the learning environment and student outcomes. A striking feature of this field is the availability of a variety of economical, valid and widely-applicable questionnaires that have been developed and used for assessing students' perceptions of classroom environment (Fraser, 1998b).

Although classroom environment instruments were originated from Western countries, many researchers have adapted and used these instruments in a variety of cultural settings. The studies indicated that these instruments are reliable and valid for use in different cultures. Furthermore, a small number of these learning instruments have been employed successfully in Indonesia (Fraser, 1985; Fraser, Pearse, & Azmi, 1982; Margianti & Fraser, 2000; Margianti, Fraser, & Aldridge, 2001; Paige, 1978, 1979; Schibeci, Rideng, & Fraser, 1987; Soerjaningsih, Fraser, & Aldridge, 2001a, 2001b).

This study focused on the development and validation of two instruments, the Electronics Laboratory Environment Inventory (ELEI) which was used to measure students' perceptions of their electronics laboratory classes and the Attitude Towards Electronics Questionnaire (ATEQ) which was used to assess student attitudes towards electronics and their course. The instruments were then validated in an investigation of the nature of the

learning environments in electronics classes in Bina Nusantara University's Computer Engineering Department.

The actual version of the personal form of the Science Laboratory Environment Inventory designed by Fraser, Giddings, and McRobbie (1991) and the Computer Laboratory Environment Inventory (CLEI) designed by Newby and Fisher (1998) were used as the basis from which to develop an instrument for assessing electronics laboratory environment. The SLEI has five scales Student Cohesiveness, Open-Endedness, Integration, Rule Clarity and Material Environment. The CLEI which was derived from the SLEI also has five scales Student Cohesiveness, Open-Endedness, Integration, Technology Adequacy and Laboratory Availability, and contains seven items per scale.

The initial development of the SLEI was guided by the following criteria. A review of the literature was undertaken to classify dimensions that were considered important in the unique environment of the science laboratory class. Guidance in categorising dimensions also was obtained by examining all scales contained in existing classroom environment instruments for non-laboratory settings (Fraser, 1994). By interviewing numerous science teachers and students at the senior high school level and asking them to comment on draft versions of sets of items, an attempt was made to make sure that the SLEI's dimensions and individual items were considered salient by teachers and students. In order to achieve economy in terms of the time needed for answering and scoring, the SLEI was designed to have a relatively small number of scales, each containing a fairly small number of items. A five-point response format Almost Never, Seldom, Sometimes, Often, Almost Always was used in the original version of the SLEI. Table 1 provides a description of the SLEI scales and information about the classification of the scales according to Moos' dimensions.

Table 1: *Descriptive Information for the Scales of the Science Laboratory Environment Inventory (SLEI)*

Scale Name	**Moos' Category**	**Description**
Student Cohesiveness	Relationship	Extent to which students know, help, and are supportive of each other
Open-Endedness	Personal Development	Extent to which the laboratory activities emphasise an open-ended divergent approach to experimentation
Integration	Personal Development	Extent to which the laboratory activities are integrated with non-laboratory and theory classes
Rule Clarity	System Maintenance	Extent to which behaviour in the laboratory is guided by formal rules
Material Environment	System Maintenance	Extent to which the laboratory equipment and materials are adequate

Adapted from Fraser, Giddings, & McRobbie (1993)

According to Newby and Fisher (1998) the CLEI also was field tested and exposed to

item factor analysis. The field-testing was carried out in Australia, England, and USA. There are 387 students in 31 classes in five schools. The Cronbach alpha coefficients which measure the internal consistency of each scale varied from 0.80 to 0.90; the mean correlation with other scales varied from 0.49 to 0.63 demonstrating that there is little overlap in what the scales are measuring. Also, it was shown that the instrument was able to distinguish between the perceptions of students in different classrooms.

Table 2**:** *Descriptive Information for the Scales of the Computer Laboratory Environment Inventory(CLEI)*

Scale Name	**Moos' Category**	**Description**
Student Cohesiveness	Relationship	Extent to which students know, help, and are supportive of each other
Open-Endedness	Personal Development	Extent to which the laboratory activities emphasise an open-ended divergent approach to experimentation
Integration	Personal Development	Extent to which the laboratory activities are integrated with non-laboratory and theory classes
Technology Adequacy	System Maintenance	Extent to which the hardware and software is adequate for the required tasks
Laboratory Availability	System Maintenance	Extent to which the laboratory and its facilities are available for use

Adapted from Newby & Fisher (1998)

Although there are similarities between science, computer, and electronics laboratories, there are also fundamental differences that will be studied; especially it is focused on the electronics field. However, given the reliability and validity of the SLEI and CLEI, it was decided to use them as the basis of the Electronics Laboratory Environment Inventory (ELEI). Student cohesiveness in electronics laboratory is important in which students are seen working together. The relationship between electronics theory and practised laboratory work is also important. The Laboratory Availability scale measures the extent to which the laboratory and laboratory equipment are available for use. This is understandable at the university level, because students are required to complete laboratory-based experiments such as collect data and make a report. If the students find peculiar results in their analyses they will often re-examine the data by revisiting the laboratory. Therefore, it was decided to include the scales of Student Cohesiveness, Integration, Open-Endedness from the SLEI and Technology Adequacy and Laboratory Availability from the CLEI in the ELEI. In the present study, response alternatives are Almost Never, Seldom, Sometimes, Often and Very Often.

Table 3: *Descriptive Information for the Scales of the Original Version of the Electronics Laboratory Environment Inventory (ELEI)*

Scale Name	**Moos' Category**	**Description**
Student Cohesiveness (SC)	Relationship	Extent to which students know, help, and are supportive of each other
Open-Endedness (OE)	Personal	Extent to which the laboratory activities emphasise an

Scale Name	Moos' Category	Description
	Development	open-ended divergent approach to the experiment
Integration (IT)	Personal Development	Extent to which the laboratory activities are integrated with non-laboratory and theory classes
Technology Adequacy (TA)	System Maintenance	Extent to which the hardware and equipment is adequate for the tasks required
Laboratory Availability (LA)	System Maintenance	Extent to which the laboratory is suitable and available for use

The instrument for measuring the attitude towards electronics courses is based on a number of other instruments. There are many instruments for measuring attitude and these contain a number of different scales. The instrument used as the basis for the Attitude Towards Electronics Questionnaire (ATEQ) was the Attitude towards Computers and Computing Courses Questionnaire (ACCC) (Newby & Fisher, 1998). This contains four scales that are Anxiety, Enjoyment, Usefulness of Electronics Courses and Usefulness of Electronics Systems.

The decision was made to restrict the number of scales for measuring aspects of attitude towards electronics to four. This was done based on economy. Four chosen were the already existing scales. Anxiety was chosen as it has been included in almost all instruments for measuring electronics attitudes, and the use of technology would appear to be associated with anxiety (Rosen, Sears, & Weil, 1987). Both Enjoyment and perceived Usefulness of Electronics Systems were included as these are known to be associated with motivation (Levine & Donitsa-Schmidt, 1997). Because a major aspect of the study described in this thesis was the effectiveness of electronics laboratories as learning environments, a fourth scale is the Usefulness of the Course. Each scale consists of seven items with each item being measured on a Likert scale from 1 (Almost Never) to 5 (Almost Always). The ATEQ was given as the second part of the survey.

Table 4: *Descriptive Information for the Scales of the Attitude Towards Electronics Questionnaire (ATEQ)*

Scale Name	Description
Anxiety (AX)	Extent to which the student feels nervous or uncomfortable using a electronics laboratory facilities
Enjoyment (EJ)	Extent to which the student enjoys using a laboratory facilities
Usefulness of Electronics Systems (UE)	Extent to which the student believes electronics system are useful
Usefulness of Electronics Courses (UC)	Extent to which the student found the course useful

OBJECTIVES OF THE STUDY

The objectives of this study were: (i) to develop and validate an actual and preferred form of the Electronics Laboratory Environment Inventory (ELEI); and (ii) to develop and validate the Attitude Towards Electronics Questionnaire (ATEQ). These objectives led to the development of the following research questions which were the focus of this study: (1) Is the Electronics Laboratory Environment Inventory (ELEI) a valid and reliable questionnaire for use in actual and preferred versions in tertiary electronics laboratories in an Indonesian University?; (2) What are students' perceptions of the Electronics Laboratory environment in an Indonesian University?; and (3) Is the Attitude Towards Electronics Questionnaire (ATEQ) a valid and reliable questionnaire for use in computer engineering students in an Indonesian University?

METHODOLOGY

The Sample

The *Science Laboratory Environment Inventory* (SLEI) (Fraser, Giddings & McRobbie, 1991) and the *Computer Laboratory Environment Inventory* (CLEI) (Newby & Fisher, 1997) were studied and modified into the Electronics Laboratory Environment Inventory (ELEI). Afterward, the ELEI was validated and used. Student perceptions on their laboratory learning environment were measured by using the five-scale, 34-item Electronics Laboratory Environment Inventory (ELEI). In the development of the instrument, a pilot study was applied to a group of alumni and laboratory assistants from the Computer Engineering Department of Bina Nusantara University in Jakarta, Indonesia. For convenience of administration, the two questionnaires were combined into a single survey having by questions 1 to 35 covered the ELEI and questions 36 to 63 covering the ATEQ. Some demographic data covered student number, course, batch year, and experience in building electronics systems were also collected. Assistants from the Hardware Technical Managing Unit and Electronics Laboratory at Bina Nusantara University who were in charge of units conducting laboratory activities were approached and 16 of them agreed to participate in the pilot study. The questionnaire was administered during the sixth week of a 13 week semester. The researcher attended eight laboratory classes distributing adequate copies of the questionnaires, and described the purpose of the research. The assistants were informed that their participation was voluntary and they were guaranteed confidentiality of their responses. The completed questionnaires were gathered and had remained in the possession of the researcher since that time. Alumni of Computer Engineering Department were listed at the Hardware Club mailing list at http://groups.yahoo.com/group/hardwareclub. The questionnaire was sent to them during the fifth week of a 13 week semester and six of the alumni responded.

Attitudinal Measures

The Attitude Towards Electronics Questionnaire (ATEQ) was used to investigate students' attitude and to find any associations between students' attitudes and their perceptions of electronics laboratory environment. Students' attitudes were measured using the four-scale, 28-item Attitude Towards Electronics Questionnaire. Data were analysed using the individual and class as the unit of analysis to investigate the reliabilities of the four scales. Correlation and regression analyses were performed to investigate association between learning environment scales and students' attitudes.

RESULTS

Reliability and Validation of the ELEI

The original ELEI questionnaire was administered in a pilot study to a group of 16 laboratory assistants and eight alumni of the Computer Engineering Department of Bina Nusantara University. The Attitude Towards Electronics Questionnaire (ATEQ) was also administered but minimal demographic data were collected. Table 5 showed some statistical information from this pilot study regarding reliability and discriminant validity. The Cronbach alpha coefficient varied from 0.35 to 0.78, showing that the internal consistency for at least three of the scales was reasonable. The mean correlation of one scale with the other four scales varied from 0.13 to 0.29 showing that there is a little overlap in what the scales are measuring. The mean correlations were noticeably less than the reliability coefficients indicating that the scales measured distinctive aspects of the learning environment of the electronics laboratory.

Table 5: *Internal Consistency (Cronbach Alpha Coefficient) and Mean Correlation Coefficient of the Scales of the ELEI in the Pilot Study*

Scale Name	Alpha Reliability	Mean Correlation
Student Cohesiveness	0.75	0.29
Open-Endedness	0.35	0.19
Integration	0.78	0.13
Technology Adequacy	0.50	0.20
Laboratory Availability	0.62	0.17

From Table 5 it can be seen that the alpha reliability for Open-Endedness was low at 0.35, but this scale was consistently lower in the cross-national study of Fraser, McRobbie, and Giddings (1993). In that study, this coefficient varied from 0.78 for England to 0.49 for Nigeria. The alpha reliability for Open-Endedness in Newby (1998) study is 0.60 which was again somewhat low. It was on these grounds it was decided to retain the Open-Endeness scale and check it again with the larger sample. However, it was decided to improve the questionnaire items by discussing them with staff and students.

Based on the discussions there were some items from four of the scales (Student

Cohesiveness, Open Endedness, Technology Adequacy and Laboratory Availability) such as numbers 2, 4, 7, 9, 10, 11, 27, 32, and 58 for ELEI; and 38, 52 and 54 for ATEQ needed to be modified. Most of the modifications were necessary because of the ambiguity or not so clear meaning to the staff and students and they gave some suggestions on what changes were needed.

The revised ELEI was administered to 353 students taking courses within the Computer Engineering Department. There were eight courses having laboratory component in both semesters, such as Integrated Electronics, Electric Circuit Theory, Discrete Electronics, Digital System, Advanced Control System, Microprocessor Application, Digital Signal Processing and Robotics/ Mechatronics. The different courses were surveyed and each of these had its own characteristics, covering relationship between laboratory and non-laboratory classes, level of course, students' prior familiarity with the laboratory environment and expectation of staff regarding student's ability to work independently.

Table 6 reported the internal consistency of the ELEI. According to Nunnally (1967), a reliability coefficient of 0.60 or greater is acceptable, so the values for each scale indicate that they are satisfactory in terms of their internal consistency. The alpha reliability of Open-Endedness scale was still low at 0.36. However, it was apparent that item number 27 had the lowest correlation with the other items in this scale. The word Actual means that what student experienced and Preferred means that what student expected to happen.

Table 6: *Internal Consistency (Cronbach alpha reliability),Discriminant Validity (Mean correlation with other scales) and Ability to Differentiate Between Classrooms (ANOVA results) for the ELE I*

Scale Name	Unit of Analysis	Alpha Reliability		Discriminant Validity		ANOVA Results eta^2
		Actual	Preferred	Actual	Preferred	
SC	Individual	0.64	0.62	0.29	0.52	0.31*
	Class	0.78	0.58	0.68	0.64	
OE	Individual	0.36	0.44	0.13	0.27	0.19*
	Class	0.87	0.62	0.31	0.51	
IT	Individual	0.69	0.68	0.26	0.44	0.34*
	Class	0.81	0.84	0.50	0.58	
TA	Individual	0.59	0.63	0.28	0.50	0.28*
	Class	0.79	0.74	0.67	0.73	
LA	Individual	0.51	0.69	0.28	0.55	0.25*
	Class	0.63	0.80	0.58	0.75	

** $p < 0.001$*

Therefore, it was decided to recalculate the reliability of the Open-Endedness scale using six items (numbers 2, 7, 12, 17, 22, and 32). For the Actual Form of the ELEI, Table 7 showed that the Cronbach's alpha reliability figures ranged from 0.50 to 0.69 when the individual student was used as the unit analysis and from 0.63 to 0.84 when the class

mean was the unit of analysis. The alpha reliabilities for the Preferred Form ranged from 0.58 to 0.69 when the individual student was used as the unit of analysis and from 0.58 to 0.84 when the class mean was used. The mean correlation of a scale with the other scales of the questionnaire was accepted as a measure of discriminant validity and was the extent to which the scales were unique in what they are measuring. The mean correlations of the scales of the Actual ELEI ranged from 0.18 to 0.29 for individual student and 0.24 to 0.68 for the class as the unit of analysis, indicating that there was a little overlap in what they were measured.

The 34-item ELEI was also subjected to a series of one way analyses of variance using course as the grouping factor. As shown in Table 7, the eta^2 statistic ranged from 0.25 for Laboratory Availability to 0.34 for Integration. The eta^2 statistic measured the amount of the variance that can be attributed to the course group. The results showed that each scale differentiated significantly ($p < 0.001$) between courses. This indicated that the ELEI was able to differentiate between students based on the course being taken.

Table 7: *Internal Consistency, Discriminant Validity and Ability to Differentiate Between Classrooms for the ELEI Without item 27*

Scale Name	Unit of Analysis	Alpha Reliability		Discriminant Validity		ANOVA Results eta^2
		Actual	Preferred	Actual	Preferred	
SC	Individual	0.64	0.62	0.29	0.52	0.31*
	Class	0.78	0.58	0.68	0.64	
OE	Individual	0.50	0.58	0.18	0.26	0.26*
	Class	0.84	0.65	0.24	0.50	
IT	Individual	0.69	0.68	0.26	0.44	0.34*
	Class	0.81	0.84	0.50	0.58	
TA	Individual	0.59	0.63	0.28	0.50	0.28*
	Class	0.79	0.74	0.67	0.73	
LA	Individual	0.51	0.69	0.28	0.55	0.25*
	Class	0.63	0.80	0.58	0.75	

? $p < 0.001$

To examine differences between students' perceptions of the actual and preferred classroom environment, data were analysed with a one-way MANOVA for repeated measures. The set of ELEI scales constituted the dependent variables and the form of the questionnaire (actual/ preferred) was the repeated measures factor. Student responses to the actual and preferred forms were matched to allow the data collected from 353 students to be analysed. Because the multivariate test produced a statistically significant result (Wilks' lambda), a t-test for paired samples was used for each individual ELEI scale to investigate whether students had different perceptions of their actual and preferred classroom learning environments.

Table 8: *t-test scores, Mean Differences, and Standard Error Difference of Actual and Preferred Form for the ELEI*

Scale Name	F	t	Mean Difference	Std Error Difference
Student Cohesiveness (SC)	11.46*	-8.90	-2.64	0.30
Open Endedness (OE)	18.76*	-15.39	-4.00	0.26
Integration (IT)	45.68*	-8.11	-2.79	0.34
Technology Adequacy (TA)	29.58*	-16.48	-5.02	0.30
Laboratory Availability (LA)	54.18*	-18.19	-5.98	0.33

** $p < 0.001$*

Table 8 showed the differences between the Actual and the Preferred Form that were found to be statistically significant ($p < 0.001$) and vary from 8.9 to 18.19, 2.64 to 5.98 and 0.26 to 0.34 for t-test score, mean difference and standard error difference, respectively. Figure 1.a illustrated the profile of the average item scores for each scale for the Actual and Preferred Form. For the Actual Form students perceived moderately a positive learning environment in Open-Endedness, Integration, Technology Adequacy and Laboratory Availability, and a highly positive environment on Student Cohesiveness. For the Preferred Form almost all scales had a highly positive environment. What was clear from Figure 1.a is that students preferred a classroom environment to be more positive that the one perceived to be actually present for all scales. The important point was the fact that the students would prefer more on all scales.

Reliability and Validation of the ATEQ

The original ATEQ questionnaire was administered in a pilot study to a group of 16 laboratory assistants and eight alumni of the Computer Engineering Department of Bina Nusantara University along with the original version of the ELEI. Table 9 showed some statistical information from this study. The Cronbach alpha coefficient varied from 0.30 to 0.83, showing that the internal consistency for two of the scales was reasonable (Nunnally, 1967). The mean correlation with the other scales varies from 0.27 to 0.36 showing that there was some overlap in what the scales were measuring. However, the mean correlations are noticeably less than the reliability coefficients indicating that the scales did measure distinct aspects of attitude.

Table 9: *Internal Consistency (Cronbach Alpha Coefficient) and Mean Correlation Coefficient of the Scales of the ATEQ in the Pilot Study*

Scale Name	Alpha Reliability	Mean Correlation
Anxiety	0.81	0.33
Enjoyment	0.83	0.46
Usefulness of Electronics Systems	0.30	0.27

Usefulness of Electronics Courses	0.42	0.36

The results of the analyses are shown in Table 10. These figures reported some statistical information about the revised ATEQ. For actual attitude, the Cronbach alpha reliability coefficients presented in the Table 10 for the four scales with seven-item figures ranged from 0.63 for the Usefulness of Electronics Courses scale to 0.76 for Enjoyment scale using the individual students as the unit of analysis and from 0.56 for the Anxiety scale to 0.86 for Enjoyment scale when the class mean was used as the unit of analysis. According to Nunnally (1967), a reliability coefficient of 0.60 or greater is acceptable, so the values of each scale indicate that they were satisfactory in terms of their internal consistency.

Table 10: Internal Consistency (Cronbach alpha reliability), Discriminant Validity (Mean correlation with other scales) and Ability to Differentiate Between Classrooms (ANOVA results) for the ATEQ

Scale Name	**Unit of Analysis**	**Alpha Reliability**		**Discriminant Validity**		**ANOVA Results eta^2**
		Actual	**Preferred**	**Actual**	**Preferred**	
Anxiety	Individual	0.68	0.74	0.44	0.58	0.33*
	Class	0.56	0.92	0.35	0.82	
Enjoyment	Individual	0.76	0.78	0.63	0.72	0.38*
	Class	0.86	0.95	0.43	0.79	
Usefulness of Electronics Systems	Individual	0.72	0.74	0.52	0.61	0.35*
	Class	0.65	0.78	0.40	0.83	
Usefulness of Electronics Courses	Individual	0.63	0.66	0.54	0.68	0.30*
	Class	0.61	0.70	0.33	0.77	

** $p < 0.001$*

The mean correlation of a scale with the other scales of the questionnaire was accepted as a measure of discriminant validity and was the extent to which the scales were unique in what they were measuring. The mean correlations of the scales of the Actual ATEQ ranged from 0.44 for the Anxiety scale to 0.63 for the Enjoyment scale for individuals and from 0.33 for the Usefulness of Electronics Courses to 0.43 for the Enjoyment scale classes as the units of analysis, respectively, indicating that there was some overlap in what they were measured. This was to be expected on such attitudinal measures. The mean correlations between the scales were also higher and more than the reliability coefficients. On the other hand for preferred attitude, the Cronbach alpha reliability coefficients ranged from 0.66 for the Usefulness of Electronics Courses scale to 0.78 for the Enjoyment and the Usefulness of Electronics Systems scales using the individual students as the unit of analysis, and from 0.70 for the Usefulness of Electronics Courses scale to 0.95 for the Enjoyment scale when the class mean was used as the unit of analysis. These figures were regarded as demonstrating. The mean correlations of the scales of the Preferred ATEQ ranged from 0.58 for the Anxiety scale to 0.72 for the Enjoyment scale for individuals and from 0.77 for the Usefulness of Electronics Courses

to 0.83 for the Usefulness of Electronics Systems scale classes as the units of analysis, respectively, indicating that there was overlap in what they were measured. These high mean correlations on the Preferred Form were to be expected since the scales were known having correlated and students answer using extreme value such as 1 or 5 for their preferred attitude. The 28-item ATEQ was also subjected to a series of one way analysis of variance using course as the grouping factor. As shown in Table 10, the eta^2 statistic ranged from 0.30 for Usefulness of Electronics Courses to 0.38 for Enjoyment. The eta^2 statistic measured the amount of the variance that can be attributed to the course. The results showed that each scale differentiated significantly ($p < 0.001$) between the courses. This indicated that the ATEQ is able to differentiate between students based on the course being taken.

To examine differences between students' perceptions of the actual and preferred classroom environment, data were analysed with a one-way MANOVA for repeated measures. The set of ATEQ scales constituted the dependent variables and the form of the questionnaire (actual/preferred) was the repeated measures factor. Student responses to the actual and preferred forms were matched to allow the data collected from 353 students to be analysed. Because the multivariate test produced statistically significant results (Wilks' lambda), a t-test for paired samples was used for each individual ATEQ scale to investigate whether students had different perceptions of their actual and preferred classroom learning environments.

Table 11: *t-test scores, Mean Differences, and Standard Error Difference of Actual and Preferred Form for the ATEQ*

Scale Name	F	t	Mean Difference	Std. Error Difference
Anxiety (AX)	79.12*	5.42	2.14	0.40
Enjoyment (EJ)	21.25*	-10.24	-3.68	0.36
Usefulness of Electronics Systems (UE)	8.57**	-6.29	-2.25	0.36
Usefulness of Electronics Courses (UC)	51.10*	-12.43	-4.09	0.33

? *$p < 0.001$, ** $p < 0.005$*

Table 11 showed differences between the Actual and the Preferred Form were found to be statistically significant ($p < 0.001$) for the Anxiety, Enjoyment, and Usefulness of Electronics Courses and ($p < 0.005$) for the Usefulness of Electronics Systems and varied from 5.42 to 12.43, 2.14 to 4.09 and 0.33 to 0.40 for t-test score, mean difference and standard error difference, respectively.

Figure 1.b illustrated the profile of the average item scores for each scale for Actual and Preferred Forms. For Actual form students indicated moderately positive attitude on Enjoyment, Usefulness of Electronics Systems and Usefulness of Electronics Courses, and a lower attitude on Anxiety. The Preferred form indicated that students would prefer to have a very positive attitude. The line with blue diamond (✍) was real and with pink square (✍) was preferred.

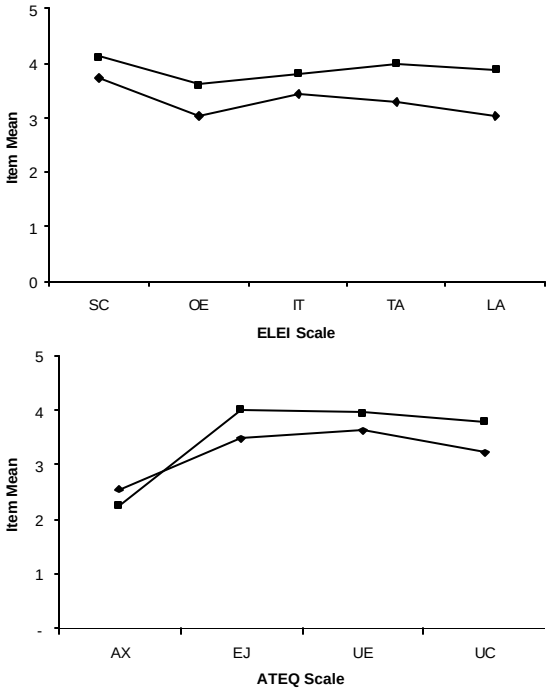

Figure 1. Profile of average item means for students' perception of a) the ELEI and b) the ATEQ.

CONCLUSION

Based on the analysis it can be concluded that two instruments were elaborated, the Electronics Laboratory Environment Inventory (ELEI) and the Attitude Towards Electronics Questionnaire (ATEQ). The ATEQ is based on a number of existing instruments with one original scale to gauge students' perceptions of the usefulness of the electronics courses. This instrument is a useful addition to those that measure electronics attitude. Although the ELEI is based on an existing instrument, it is used in a completely new setting, the electronics laboratory classroom. The development of the ELEI and ATEQ are one of the most significant outcomes from this research. Its scales have been shown to have acceptable reliability and discriminant validity in this study. This instrument is now available to researchers and lecturers, and should prove useful in the design and implementation of the laboratory component of a course and in the formative evaluation of such a course.

The first research question is whether the Electronics Laboratory Environment Inventory (ELEI) a reliable and valid questionnaire for use in actual and preferred versions in tertiary electronics laboratories in Indonesia? This study reports the development and use of an instrument for measuring the psychosocial environment of a electronics laboratory classroom. It was used in a university setting in courses involving electronics systems and laboratory equipments as an integral part of the course. From the analysis figures it is concluded that the ELEI is reliable and valid for use in computer engineering students in Indonesia, because the collection development is mainly based on the subjects' that students got from the class, the availability of information and services which are web-based therefore the students are able to download information and try to

build the electronic systems in the laboratory.

The second research question is what are students' perceptions of the Electronics Laboratory environment in an Indonesian University? Student perceptions according to the Actual Form and the individual student as the unit of analysis, show that average student scores ranged from 3.04 (approximately corresponding to Sometimes) to 3.74 (approximately corresponding to Often) for different scales. These results indicated that the students are happy in conducting laboratories activities. However, there was a burden such as they had to submit the weekly report, especially when they took two laboratory subjects in one semester. The laboratory regulations state that if the students are late in submitting the reports, their marks will be decreased. For the Preferred Form, and the individual student as the unit of analysis, show that average student scores ranged from 3.73 to 4.12 (approximately corresponding to Often) for different scales. These results show the students' expectation in developing laboratory works and facilities they want more time to do their own experiment and more tools that can be borrowed. From the above figures it is concluded that students' perceptions of the Electronics Laboratory environment in an Indonesian University is that students preferred a classroom environment to be more positive that the one perceived to be actually present for all scales. The important point is the fact that the students would prefer more on all scales.

The third research question is whether the Attitude Towards Electronics Questionnaire (ATEQ) a valid and reliable questionnaire for use in computer engineering students in Indonesia? This study reports the development and use of an instrument for measuring the student attitudes towards electronics laboratory classroom environment. From the analysis figures it is concluded that the ATEQ is reliable and valid for use in computer engineering students in an Indonesian University.

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ASSESSING ACADEMIC COMPUTING IN MALAYSIAN HIGHER EDUCATION: A VALUE CHAIN APPROACH

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ABSTRACT

Analysis on thirty-three academic computing-themed journal and conference papers identifies 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) ICT Information Services; and 6) ICT Institutional Support. In addition, nine ICT assessment frameworks encompassing certain academic computing areas are analysed. To develop an academic computing assessment framework for Malaysian higher education, a model is proposed using the value chain approach. The model includes all six academic computing areas as well as components of each area. To implement the model, a case study was conducted on five higher education institutions in Malaysia. Findings from the case study are used to identify forty-six performance indicators and rubrics that differentiate and describe the different levels of academic computing implementation in higher education institutions.

INTRODUCTION

In the information age where information and communication technology (ICT) is transforming the educational landscape around the world, higher education institutions must be able to provide quality education to fulfil the various needs in the country (Lumby, 2001) and remain competitive in a global knowledge industry (Duderstadt, 1997). Since the 1990s, ICT has advanced very rapidly in Malaysia. To a certain extent, what propels ICT to the forefront was Malaysia's intention to be a fully developed nation by the year 2020 – a concept now widely known as Vision 2020. To achieve this ambitious goal, many began to look to ICT to provide the required human resources through efficient education and training. Its impact on education, while not yet pervasive, has made considerable inroads. The implementation of ICT in higher education is generally autonomous and what has been achieved is relatively unknown (Gan, 2001). Research by UNESCO (2004a) found that many Asia-Pacific countries including Malaysia lack the proper framework to measure ICT implementation 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 ICT initiatives. As Asia-Pacific countries differ widely in regard to scope and use of ICT in education, 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 (UNESCO 2004a).

AREAS OF ACADEMIC COMPUTING

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.

Literature categorises the broad areas of teaching, learning and research into smaller academic computing areas. There are variations in the clustering and labelling of these areas, due to the variations in its organisation and scope implemented at different higher education institutions (Brookeshire, 1989; Cooper 1991).

Six main areas of academic computing are identified. They are:

- ? Teaching and Learning Using ICT
- ? Researching Using ICT
- ? ICT Vision, Plan, Policies and Standards
- ? ICT Infrastructure
- ? ICT Information Services
- ? Institutional ICT Support

TEACHING AND LEARNING USING ICT

The emergence of ICT particularly the Internet has ignited the information age and is changing how teaching and learning is conducted. To facilitate the continuous and ever-growing needs of the society in acquiring new knowledge and skills, innovative ways of using ICT to enable and enhance teaching and learning are being implemented in higher education throughout the world (Haddad, 2003). This new environment brings about the concept of lifelong learning and borderless education (Mason, 2003), where it provides both opportunities and challenges to higher education institutions (Duderstadt, 1997).

Researching Using ICT

The advancement of ICT and the rapid growth of the Internet help establish new methods of research across the world (McCredie, 2003). ICT-enabled research does not in any way render the older research methods and techniques obsolete, but extend traditional research efforts (Anderson and Kanuka, 2002). ICT enables faster processing of large amount of data with higher precision as well as simulates complex systems and phenomena. It also allows different groups of researchers to collaborate across time and space, share data, ideas, expertise and the latest findings. It is possible now to remotely access specialised research facilities. ICT also plays a very important role in the capture

and dissemination of emerging academic and professional knowledge and information (Amiran et al., 1992).

ICT Vision, Plan, Policies and Standards

Implementing academic computing in higher education is a long process that may take many years to be successful (Dias, 1999). Therefore, the role of ICT vision, plan, policies and standards are very important. Many factors must be taken into account before and during the implementation of ICT initiatives. Failure to address important issues may result in wasted resources and ineffective implementation. Due to the high costs of ICT investment, it is important for higher education institutions to be selective and undertake the ICT initiatives that give the most return (Mason, 2003). Serious consideration must be given to ensure quick adoption of ICT and later sustain the technological innovation once it is adopted. Higher education institutions must carefully consider all academic computing issues and employ the necessary policies to ensure successful academic computing implementation.

ICT Infrastructure

ICT infrastructure forms the foundation of academic computing. The importance of ICT infrastructure in today's knowledge based environment is as such that McCredie (2003) equates it with older essential technological infrastructures such as electricity and transportation. The absence of the necessary infrastructure, due to its high costs or its perceived lack of importance, forms a barrier to institutions providing ICT-enabled education offerings. This may create a digital divide between higher education institutions and consequently the students, and therefore gives an adverse effect on the quality of higher education as a whole (Barone, 2001).

ICT Information Services

Higher education institutions are important producers of information and knowledge. This is highlighted by McCredie (2003 p.6) who states that the main mission of higher education is the "creation, integration, preservation, transmission and application of information and knowledge". Easy access to these information and knowledge is essential to support the teaching process and enhance the learning experience for students. In addition, the higher education community also expect information regarding other services available to them accessible at their fingertips. These needs are more significant today with the increasing number of people enrolling into distance education programmes (Dhanarajan, 2000). With students at remote locations, ICT has become the most feasible platform to disseminate information quickly and at affordable cost.

Institutional ICT Support

In academic computing, skills are required to effectively use ICT in teaching and learning, securing material through online resources, proper methods of effective research, design of courseware and utilising information services provided by the

institution. To acquire these skills, the institutions need to support their students and academic staff through effective training programmes (Rogers, 2000). Other forms of institutional support include technical and administrative support. Technical support includes maintenance of infrastructure and assistance to users (Bakia, 2000). Cox et al. (1999) suggest that the most effective way to adopt ICT is when institutions give their full support to the implementation of academic computing.

ACADEMIC COMPUTING-THEMED LITERATURE

From a selection of thirty-three academic computing-themed literature (see Table 1), the most frequently described academic computing area is ICT Infrastructure (32), followed by Institutional ICT Support (30), Teaching and Learning Using ICT (23), ICT Vision, Plan, Policies and Standards (21), ICT Information Services (20) and Researching Using ICT (16). Study on academic computing seems to give more emphasis to issues regarding ICT infrastructure and institutional ICT support. Although researching using ICT is a primary activity in academic computing, it is the least discussed in the selected literature and the discussion is often brief.

Table 1: Academic computing areas described in selected literature

Authors	Academic computing areas arranged in columns of similar theme					
	Teaching & Learning	Researching	Vision, Plan, & Policies	Infrastructure	Information Services	Institutional Support
Abend, 1997			✍	✍	✍	✍
Ardoin and Weems, 1993				✍	✍	
Brookshire, 1989				✍		✍
Cohn *et al.*, 2004	✍	✍	✍	✍	✍	✍
Conrad, 1992	✍	✍	✍	✍	✍	✍
Cooper, 1991			✍			✍
Corman and Lach, 1995	✍	✍		✍		✍
Dury and Marks, 1990	✍		✍	✍		✍
Ferguson *et al.*, 2004	✍	✍	✍	✍	✍	✍
Ferrer and Corya, 1990	✍	✍		✍	✍	✍
Gardner and Schwob, 1990				✍	✍	✍
Gloster and Salzberg, 1995	✍	✍	✍	✍	✍	✍
Greenberg, 1993	✍	✍		✍		✍
Hancock *et al.*, 1995			✍	✍	✍	✍
Harris, 1993	✍	✍	✍	✍		✍
Higginbotham, 1997	✍		✍	✍	✍	✍
Huth, 1991				✍		✍
Johnston and Supra, 1997				✍	✍	✍
Kettinger, 1990	✍	✍	✍	✍		✍
McMullen, 1996	✍	✍	✍	✍	✍	✍
Nielsen *et al.*, 1995	✍	✍	✍	✍	✍	✍
Nixon and Lackie, 1998	✍	✍	✍	✍	✍	✍
Olexy, 1991	✍			✍	✍	✍
Pittinsky, 1999	✍			✍	✍	
Prescott, 2001				✍		✍
Prupis, 1989	✍	✍	✍	✍	✍	✍
Rice and Miller, 2001	✍		✍	✍		✍
Ricigliano and Owen, 1995	✍	✍	✍	✍	✍	✍
Rohde and Haskett, 1990			✍	✍		✍
Sprague, 1994	✍		✍	✍	✍	✍
VanValey and Poole, 1994	✍		✍	✍		
Wall, 1991	✍	✍	✍	✍	✍	✍
Wilson and McCarville, 1991	✍	✍		✍		✍

ACADEMIC COMPUTING ASSESSMENT FRAMEWORKS

Nine ICT assessment frameworks that encompass certain aspects of academic computing are described in this paper. The selected frameworks are summarised in Table 2.

Code of Practice Quality Assurance in Public Universities in Malaysia

The document "Code of Practice Quality Assurance in Public Universities in Malaysia third edition" published by the Quality Assurance Division, Ministry of Higher Education (2005) contains guidelines on criteria and standards for higher education in Malaysia and the procedures for quality assurance. The code of practice is intended for use by universities in institutional self-evaluation of their educational programmes and for use by peer review committees and bodies involved in recognition and accreditation of programmes. Within the document, there is a framework that provides some standards and assessment questions on ICT.

UNESCO's Performance Indicators on ICT Use in Education Project

The Performance Indicators on ICT Use in Education Project is a Japan Funds-in-Trust project undertaken by UNESCO Bangkok. The project aims at developing a structure of indicators to measure ICT use and impact in education. Under the project, a set of indicators was proposed during the Consultative Workshop for Developing Performance Indicators for ICT in Education in 2002. These indicators will be used as a basis for policy planning and programme improvements, specifically demonstrating if and how the use and integration of ICT are actually raising educational standards, serving as a catalyst for educational change and empowering teachers and learners (UNESCO, 2004b).

The Campus Computing Project

The Campus Computing Project was designed as a framework to measure ICT implementation in higher education. Begun in 1990, the Campus Computing Project is the largest continuing study of ICT in American higher education. The framework uses survey data based on the responses provided by senior campus officials, typically the senior institutional technology officer. Analysis from the survey is used to identify ICT trends in higher education as well emerging practices. It also provides institutions a common platform to measure their performance against benchmark information. The Campus Computing Project has been expanded to Asia under the Asian Campus Computing Survey (Campus Computing Project, 2004).

Becta's ICT and E-learning in Further Education Survey

The ICT and E-learning in Further Education Survey is designed as a framework to measure ICT implementation in higher education. Begun in 1999, the ICT and E-learning in Further Education Survey is the largest continuing study of ICT in UK higher education. The survey was conducted by British Educational Communications and

Technology Agency (Becta) on behalf of the Learning and Skills Council. The study takes the form of a survey by questionnaire with the responses provided by senior campus officials (Becta, 2004).

IFIP's Information and Communication Technology in Higher Education

The document entitled "Information and Communication Technology in Higher Education" was proposed by the International Federation for Information Processing (IFIP) in 2000. The document underlines a framework that describes the development of ICT in higher education. The framework identifies various approaches to the development of ICT. These approaches are related to the situation in a particular institution across all areas related to the growth of ICT in the institutional system. The framework has proposed a matrix to help institutions determine their stage of development in various areas. An institution may find itself more in one area of the matrix while being less involved in other areas (IFIP, 2000).

Quality on the Line: Benchmarks for Success in Internet-based Distance Education

Quality on the Line: Benchmarks for Success in Internet-based Distance Education was produced by The Institute for Higher Education Policy and sponsored by the National Education Association, the nations' largest professional association of higher education faculty, and Blackboard Inc., a leading Internet education company. The framework identifies twenty-four benchmarks considered essential to ensuring excellence in Internet-based distance learning. The benchmarks are divided into seven categories of quality measures currently in use on campuses in the United States. These benchmarks distil the best strategies used by colleges and universities that are actively engaged in online learning, ensuring quality for the students and faculty who use it (Institute for Higher Education Policy, 2000).

International Survey-Online Learning: Strategies, Infrastructure & Initiatives

The Observatory on Borderless Higher Education conducted an international survey of online learning development in Commonwealth universities. The aim is to collate international data from a wide range of universities, but not to publish details of individual institutions. Respondents will receive analysis of survey results and gain access to specially developed benchmark information, enabling institutions to compare their position on a range of variables against national and international trends. This is designed to aid institutional planning and resource allocation (Observatory on Borderless Higher Education, 2004).

CAUSE/EDUCOM Evaluation Guidelines for Institutional Information Technology Resources

The purpose of the framework is to provide institutions and regional accrediting associations in the United States with evaluation guidelines for IT resources that could use as a reference when developing their own standards for this area. These guidelines

have been developed based on accreditation team experiences. They also have been reviewed and endorsed by the CAUSE and EDUCOM Boards, two key organisations in the IT field in higher education (CAUSE/EDUCOM, 1988).

Self-assessment for Campus Information Technology Services

The framework was developed by Fleit (1994) to be used as self-assessment of IT services. The questions are arranged into six categories: planning, policies and procedures, facilities and staff, products and services, organisation and external relationships and funding.

Table 2: ICT assessment frameworks across academic computing areas

ICT Assessment Framework	Locale/ Level of Education	Unit of Analysis/ Year of Conception	Academic computing areas arranged in columns of similar theme					
			Teaching & Learning	Researching	Vision, Plan, & Policies	Infrastructure	Information Services	Institutional Support
1. Code of Practice Quality Assurance in Public Universities in Malaysia (Ministry of Higher Education, 2005)	? Malaysia ? Public Universities	? Organisation ? 2005	✍		✍	✍	✍	✍
2. Performance Indicators on ICT Use in Education Project (UNESCO, 2004b)	? Asia Pacific ? Primary and secondary	? National and organisation ? 2002	✍		✍	✍		✍
3. Campus Computing Project (2004)	? United States, Asia ? Tertiary	? Organisation ? 1990	✍	✍	✍	✍	✍	✍
4. ICT and E-learning in Further Education Survey (Becta, 2004)	? United Kingdom ? Tertiary	? Organisation ? 1999	✍		✍	✍	✍	
5. ICT in Higher Education (IFIP, 2000)	? International (general) ? Tertiary	? Organisation ? 2000	✍		✍	✍		✍
6. Quality on the Line: Benchmarks for Success in Internet-based Distance Education (Institute for Higher Education Policy, 2000)	? United States ? Tertiary (distance education)	? Organisation ? 2000	✍		✍		✍	✍
7. International Survey-Online Learning: Strategies, Infrastructure & Initiatives (Observatory on Borderless Higher	? Europe, Canada and South Africa ? Tertiary (distance education	? Organisation ? 2002	✍		✍	✍		

ICT Assessment Framework	Locale/ Level of Education	Unit of Analysis/ Year of Conception	Academic computing areas arranged in columns of similar theme					
			Teaching & Learning	Researching	Plan, & Policies	Infrastructure	Information Services	Institutional Support
Education, 2004)	)							
8. CAUSE/EDUCOM Evaluation Guidelines for Institutional Information Technology Resources (Fleit, 1994)	? United States ? Tertiary	? Organisation ? 1988			✍	✍		✍
9. Self-assessment for Campus Information Technology Services (Fleit, 1994)	? US ? Tertiary	? Organisation ? 1994			✍	✍		✍

VALUE CHAIN-BASED ASSESSMENT MODEL

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 value chain model has been adapted by researchers to analyse the activities in other non-business related fields. Venkatraman (1991) adopts the value chain framework in his discussion of IT-induced business reconfiguration. King and Ko (2001) use the value chain approach to evaluate knowledge management and the learning organisation. Elloumi (2004) uses the value chain analysis as a strategic approach to online learning.

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. The key to analysing the value chain is to understand the academic computing activities within the institution that contribute to successful implementation and then managing those activities. This research proposes an academic computing assessment model adapted from Porter's value chain model, as shown in Figure 1.

As with the original Porter's value chain model, academic computing activities consist of two groups: primary activities 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, and Researching Using ICT. 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, ICT Infrastructure, ICT Information Services and Institutional ICT Support.

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 academic staff, 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.

Operationalisation of the Model

To operationalise the academic computing assessment model, the research needs to develop a set of performance indicators. Idrus et al. (1998) suggest a number of ways of measuring performance indicators, including quantitative and qualitative measures. Nuttall (1994) adds there are views that the inclusion of both types of measures allows the performance indicators to portray the full richness and diversity of the process and focus beyond the trivial and unimportant.

To identify performance indicators for all areas of academic computing, a case study was conducted on five higher education institutions. These institutions are initially selected to represent the low, moderate and high level of academic computing implementation based on the ICT information provided by the institutional websites and how they are utilised to disseminate information. In general, the website for low level institution provides limited

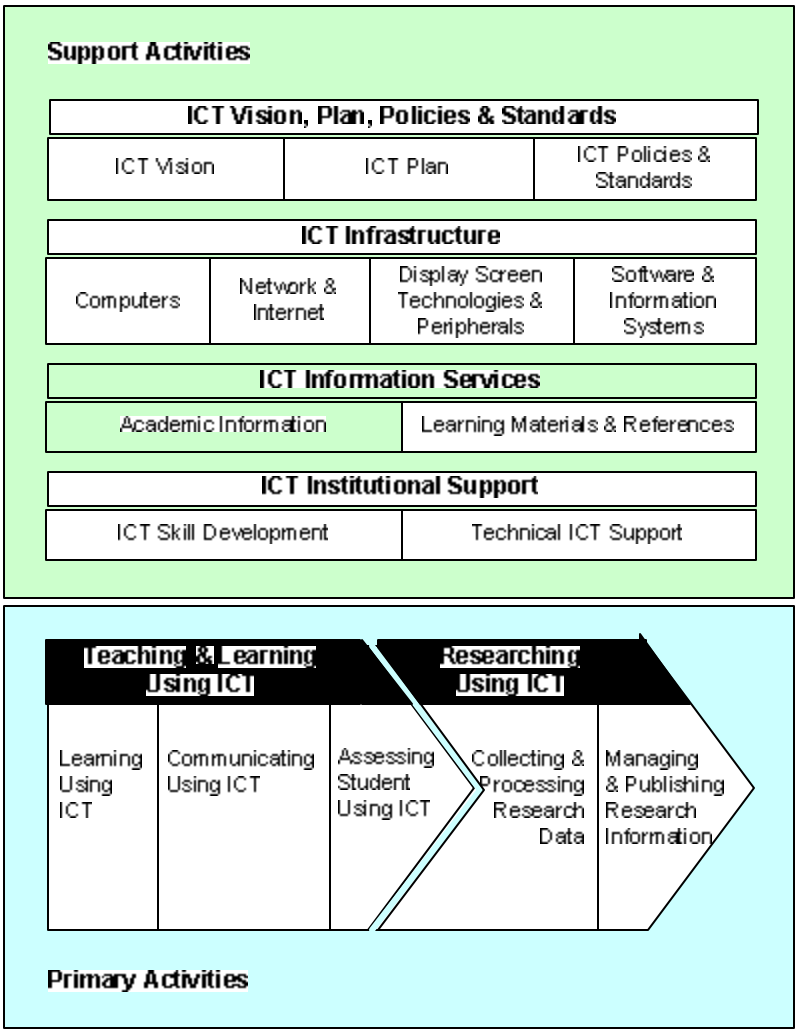

Figure 1: Academic computing assessment model

static information and is largely focused on the programmes on offer. The website for moderate level institution provides a fair amount of static and dynamic information. The website for high level institution provides a large amount of static and dynamic information and incorporates online applications.

At all five institutions, personal interviews were conducted involving the academic management, ICT management, academic staff and students. They were asked about ICT infrastructure, planning, organisation, integration in teaching and learning and other aspects of academic computing implementation in their institution. The study identifies the unique characteristics that differentiate the level of academic computing implementation in the institutions and are used to form the performance indicators. The operationalised academic computing assessment model is shown in Figure 2.

FINDINGS OF THE CASE STUDY

Teaching and Learning Using ICT

The activities related to the use of ICT for teaching and learning are largely based on the e-learning model proposed by Powel et al. (2004). They include: 1) using ICT as a source of information in preparing lesson plans and teaching material, 2) using ICT to support learning (i.e. complementary activities typically conducted outside scheduled learning; e.g., using internet for research, word processor for assignment, etc.), 3) using ICT in a role similar to traditional classroom tool (e.g. using presentation software with display screen technology to replace the use of OHP and transparency, etc.), 4) using ICT in parallel with traditional learning (e.g. using multimedia courseware, curriculum website, computer modelling, etc. to complement traditional lecture mode) and 5) using ICT to enable flexible learning (i.e. e-learning for independent, self-paced, flexible time, remote location learning). Other teaching and learning activities include using ICT as a means of academic related communication and discussion involving students and academic staff and the use of ICT in student assessment encompassing online submission of work, e-portfolio and e-presentation, and online test and examination.

The difference between low, moderate and high implementation in the five selected institutions depends largely on the percentage and frequency in which ICT is used in courses by academic staff and students. In general, low implementation is reflected by ICT use involving less than twenty-five percent of courses, academic staff or students and the infrequent ICT use. Moderate implementation is reflected by ICT use involving twenty-five to fifty percent of courses, academic staff or students and the regular ICT use. High implementation is reflected by ICT use involving more than fifty percent of courses, academic staff or students and the frequent ICT use.

Researching Using ICT

The activities related to the use of ICT for research include: 1) using Internet and online resources as source of research information, 2) using ICT as a means to collect data (e.g. online survey, web logs and tracking tools, interviews via e-mail, etc.), 3) using ICT (computer hardware and software) to process and analyse research data, 4) using ICT to manage and document research projects, 5) using ICT to communicate and collaborate between research project members, and 6) using ICT to share, disseminate and publish research data and findings.

The difference between low, moderate and high implementation in the institutions depends on the percentage in which ICT is used in research activities. In general, low implementation is reflected by ICT use involving less than fifty percent of research projects. Moderate implementation is reflected by ICT use involving fifty to seventy-five percent of research projects. High implementation is reflected by ICT use involving more than seventy-five percent of research projects.

ICT Vision, Plan, Policies and Standards

Low: ICT vision is just beginning to develop and is largely driven by a small group of enthusiastic lecturers. Their goals and objectives are related to the learning of ICT skills and the uses of technology based on their own knowledge and expertise and the resources available. The role of ICT specialists is limited to providing technical support to the users in the form of routine maintenance of infrastructure and outlining the specification of equipment to be purchased. The position of ICT specialists in relation to the vision is of a follower with the enthusiastic lecturers taking the lead. As for the rest of the campus community, they are generally unaware of the ICT initiatives in the institution. ICT planning is largely limited to the acquisition of basic hardware and software. The plan is developed by ICT specialists based on routine needs of infrastructure maintenance and purchasing requests from a small group of lecturers. Funding for implementing the ICT plan is limited and budgeted on a year-to-year basis. There are very few ICT policies and standards. Existing ICT policies are confined to the purchasing of equipments and access for learners. However, some policies are restrictive in nature. For instance, there is a policy that limits learner access to computers to only scheduled class hours to protect the computers from vandalism and misuse. The policies are developed by administrators of the institution with very little input from the ICT specialists and lecturers. In addition, there isn't any proper review process of policies and standards. With only a few ICT policies and standards in place, there is a lack of awareness from the general campus community.

Moderate: As ICT develops, both ICT specialists and lecturers play significant roles in driving the vision. ICT specialists are from the ICT unit headed by a manager. Their goals and objectives are related to the development of infrastructure based on their own view of what are needed in the institution as well as the request and feedback by the lecturers. The lecturers play an equally significant role in driving the vision emphasising on the improvement of learning and the management of learning. However, this vision is not shared by all lecturers and does not encompass the whole learning community in the institution. Nevertheless, efforts are underway to built greater campus community awareness and understanding of ICT initiatives. ICT planning encompasses the development of infrastructure, the use of ICT in teaching and learning and professional development. Both ICT specialists and subject specialists (lecturers) contribute to the development of ICT plan. A fair amount of funding is provided for implementing the ICT plan and it is supported by annual and special programme budget. As for ICT policies and standards, they encompass the acquisition and maintenance of ICT infrastructure, information literacy and learner access. In addition, the policies and standards cover aspects of acceptable use and ethics. There is also a plan to develop additional policies and standards on the use of ICT to improve teaching and learning. The policies are generally permissive in nature, where the main purpose is to allow the campus community to utilise the campus ICT facilities and resources for educational reasons. The policies are developed by administrators of the institution with significant input from the ICT specialists and lecturers. In terms of implementation, many of the policies and standards are in place, but are inconsistently implemented. The policies and standards are also reviewed from time to time based on the requests and recommendations of ICT

specialists and lecturers. The awareness of the policies and standards are generally fair, and efforts are underway to built greater understanding particularly among staff and lecturers.

High: The top management provides leadership in driving the vision. The significant role of ICT to the learning outcome is integrated in the institution vision statement. Focus is given to the development of a learning environment based on ICT and to integrate technology across the curriculum. Emphasis is also given to researching, developing and promoting new application of ICT in academic environment. The institution also visualises itself as network centred, providing a physical place to learn as well as web based learning spaces, accessible anytime, anywhere by students and lecturers. In support of the vision, the institution introduces policies that encourage and enforce the use of ICT among the campus community. With the institution providing leadership, the vision is shared by the all administrators, lecturers, staff and students. They have good awareness of ICT in various aspects of higher education and are well informed of the present and planned ICT initiatives. ICT plan comprehensively encompasses various aspects of infrastructure, the use of ICT in teaching, learning and research, professional development and technical support. The plan is developed with participation from the top management, lecturers, staff and students. They are actively involved in giving input, implementing and evaluating components of the ICT plan. A significant amount of funding is provided for implementing the ICT plan and it is supported by annual and special programme budget. ICT policies and standards encompass infrastructure, learner access, information literacy and the use of ICT to improve teaching, learning and research. In addition, the policies and standards cover aspects of acceptable use, ethics, copyright, intellectual property and incentives for using ICT. The policies are generally inclusive in nature, where the main purpose is to get the whole campus community to fully utilise the campus ICT facilities and resources for educational reasons, either by encouragement or enforcement. In terms of implementation, many of the policies and standards are in place and consistently implemented. The policies and standards are also reviewed regularly based on the recommendations and feedback from ICT specialists, lecturers and students. There is generally good awareness and understanding of the policies and standards among the campus community.

ICT Infrastructure

Low: The ratios of computers to students and is very low. Many of the computers are also quite old where almost half of them have been used for more than three years. The computer labs are only accessible to students with courses requiring them to use the computers. As for academic staff, one desktop computer is commonly shared between groups of four to six academic staff. As for notebook computers, the number is much less where one is shared between ten academic staff. Notebook computers are only used for presentation during classes or special occasions. The campus network in the institution is based upon a mixture of 10MBps and 100MBps Ethernet technology. The campus uses 1Mbps Internet connection via broadband which is based on best effort service. From observations and interviews with academic staff and students, access to the Internet is very slow unreliability is a frequent problem. As for wireless network, there is no

coverage whatsoever. Display screen facilities are very limited where one LCD projector is shared by ten academic staff. As for IT peripherals, they are made up of mostly printers although there are a few units of scanners, digital cameras and audio/video recorders for use by the administration and academic staff. The software applications available to all students and academic staff are office applications such as word processing, spreadsheets, databases and presentation software. Subject specific software is only available to certain students and academic staff based on course requirements. No online learning platform exists at the institution. As for academic information system, academic and student data are stored mainly in spreadsheets and separate databases. Processing of information is manually done using the computer. Automation is virtually none existent.

Moderate: As ICT develops, the availability of computers to students and academic staff is much better. The ratios of computers to students and Internet-connected computers to students are at 1:4 and 1:8 respectively. Many of the computers are also quite new where seventy-five percent of them are only one to two years old. As for academic staff, one desktop computer is commonly shared between groups of two to four academic staff. As for notebook computers, one is shared between six academic staff. Notebook computers are frequently used by academic staff for delivery of lectures and student presentations. The campus network in the institution is based upon 100MBps Ethernet technology. The campus uses 2MBps to 4Mbps Internet connection via broadband. From observations and interviews with academic staff and students, the biggest constraint on Internet use is the slow access especially during peak hours. Wireless network coverage is currently at twenty-five to fifty percent of total learning area. Display screen facilities are limited where one LCD projector is shared by four academic staff. As for IT peripherals, students and academic staff have access to a variety of peripherals such as printers, scanners, digital cameras and audio/video recorders. Application software available to students and academic staff are office applications, subject specific software, multimedia authoring and video/audio production and web tools. The online learning platform is generally made up of web pages on campus Intranet and learning material files stored in public folders on the campus network. As for academic information system, it encompasses mainly registration and examination functions. Access to the system is largely limited to administrative staff.

High: The ratios of computers to students and Internet-connected computers to students are at least 1:3 (all computers are Internet-connected). As for computer per academic staff, the ratio is at 1:1. However, due to the high integration of ICT in all courses, the excellent computer per student ratio is just enough to fulfil the high demand from students. The campus network in the institution employs a mixed Gigabit and 100Mbps Ethernet technologies. The campus uses 10Mbps Internet broadband connection. The performance is good where access to the network/Internet is always smooth without appreciable delay. Wireless network coverage is more than fifty percent of total learning area. Display screen facilities encompass more than fifty percent of classrooms. As for IT peripherals, students and academic staff have good access to a wide range of peripherals such as printers, scanners, digital cameras, audio/video recorders, portable devices, specialised devices for research and instructional purposes and computer conferencing facilities. Application software available to students and academic staff are office

applications, subject specific software, multimedia authoring and video/audio production, web tools, collaborative and conferencing, and specialised software for instruction and research. The learning management system used in the institution is customised in-house using open source technologies. As for academic information system, it encompasses a variety of academic and student functions. Some of the functions have become paperless. Specific functions can be access by staff and students from the Intranet and Internet.

ICT Information Services

Low: The institutional website provides only a very brief listing of academic programmes on offer. Learning support materials accessible online involve less than twenty-five percent of courses. Access to online journals and databases is very limited and they are accessible only from the library.

Moderate: The institutional website provides general academic information such as programme structure and requirements, and description of courses. Learning support materials accessible online involve twenty-five to thirty percent of courses. Access to online journals and databases covers many related fields of study and they are accessible from the library and certain computers within campus.

High: The institutional website provides a wide variety of information, including a detail description of programmes and courses, as well as other academic and student related information such as academic calendars, activities and announcements. Learning support materials accessible online involve more than fifty percent of courses. Access to online journals and databases covers all related fields of study and they are sufficiently accessible by staff and students from within and outside campus.

Institutional ICT Support

Low: In developing ICT skills for students, ICT literacy course is included as a separate unit or course in the curriculum and is compulsory for some of the programmes being offered. ICT skill development also involves less than twenty-five percent of academic staff. Regarding ICT technical support, the ratio of technical ICT support staff to computer labs and areas is low at 1:6 to 1:8. As a result, ICT tasks and problems are seldom resolved in a timely and efficient manner. Support for ICT users is available when requested, but it is limited to resolving hardware problems and software installations.

Moderate: In developing ICT skills for students, ICT literacy course is included as a separate unit or course in the curriculum and is compulsory for many of the programmes being offered. ICT skill development also involves twenty-five to seventy-five percent of academic staff. Regarding ICT technical support, the ratio of technical ICT support staff to computer labs and areas is between 1:3 and 1:5. ICT tasks and problems are not always resolved in a timely and efficient manner. Ongoing support for ICT users is readily available. However, the support is limited to resolving hardware problems, software installations and the general ICT use in common applications.

High: In developing ICT skills for students, ICT literacy course is included as a separate unit or course in the curriculum and is compulsory for all of the programmes being offered. ICT skill development also involves more than seventy-five percent of academic staff. Regarding ICT technical support, the ratio of technical ICT support staff to computer labs and areas is 1:2 or better. As a result, ICT tasks and problems are always resolved in a timely and efficient manner. Ongoing support for ICT users is readily available, encompassing hardware, software, general ICT use and specific ICT development and use in teaching, learning and research environment.

RUBRICS AS AN ASSESSMENT TOOL

To identify the different levels of academic computing implementation for each indicator, rubrics are used. According to Pickett (1998), rubrics are sets of categories that define and describe the important components of the areas being assessed. Each category contains a gradation of levels of implementation with a score assigned to each level and a clear description of what criteria need to be met to attain the score at each level. As an assessment tool, rubrics are effective in evaluating institutional performance in areas that are complex and vague. Rubrics can be created in a variety of forms and levels of complexity, however, they all contain common features which focus on measuring a stated objective (performance or quality), use a range to rate performance and contain specific performance characteristics arranged in levels indicating the degree to which a standard has been met. Based on findings of the case study described in the previous section, the variations of academic computing implementation at the five higher education institutions are analysed. As a result, six separate rubrics representing the low, moderate and high level of implementation in six academic computing areas are proposed, as shown in Table 3 through Table 8.

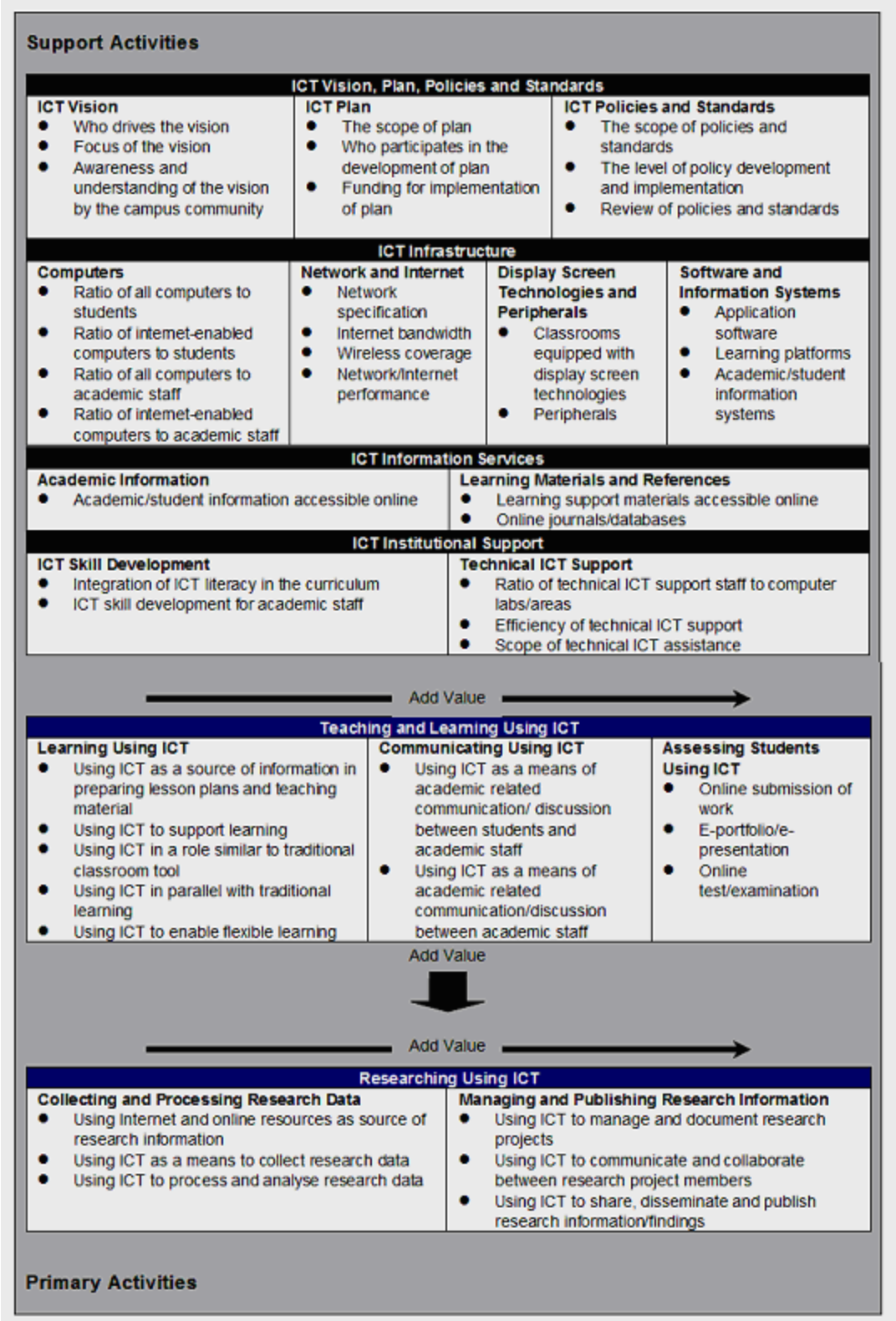

Figure 2: Operationalised academic computing assessment model

Table 3: Rubric for ICT Vision, Plan, Policies and Standards

ICT Vision	**Levels of Implementation**		
	Low	**Moderate**	**High**
Who drives the vision	Driven by enthusiastic lecturers.	Driven by ICT specialists and lecturers.	Driven by the top management by providing leadership.
Focus of the vision	Focus on the learning of ICT skills and the uses of technology.	Focus on the infrastructure and improvement of learning and the management of learning.	Focus on ICT based learning environment based on ICT and technology integration.
Awareness and understanding of the vision by the campus community	Generally unaware of any ICT vision.	Efforts are underway to build greater awareness and understanding	Good awareness and are well informed.
ICT Plan	**Levels of Implementation**		
	Low	**Moderate**	**High**
The scope of plan	Limited to the acquisition of basic hardware and software.	Encompasses infrastructure, the use of ICT in teaching and learning and professional development.	Encompasses infrastructure, the use of ICT in teaching, learning and research, professional development and support.
Who participates in the development of plan	Developed by ICT specialists.	ICT specialists and lecturers contribute to the development of the plan.	Developed with participation from the top management, lecturers, staff and students.
Funding for implementation of plan	Limited amount.	Fair amount.	Significant amount.
ICT Policies and Standards	**Levels of Implementation**		
	Low	**Moderate**	**High**
The scope of policies and standards	Confined to the purchasing of equipments and access for learners.	Encompasses infrastructure, learner access, information literacy, acceptable use and	Encompasses infrastructure, learner access, information literacy, teaching and

		ethics.	learning, acceptable use, ethics, copyright, intellectual property and incentives.
The level of policy development and implementation	Very few are in place.	Many are in place, but are inconsistently implemented.	Many are in place and consistently implemented.
Review of policies and standards	None.	Reviewed from time to time based on requests and recommendations of ICT specialists and lecturers.	Reviewed regularly based on the recommendations and feedback from ICT specialists, lecturers and students.

Table 4: Rubric for ICT Infrastructure

Computers	**Levels of Implementation**		
	Low	**Moderate**	**High**
Ratio of all computers to students	1:9+	1:8 to 1:4	1:3 or better
Ratio of internet-enabled computers to students	1:9+	1:8 to 1:4	1:3 or better
Ratio of all computers to academic staff	1:5+	1:2 to 1:4	1:1 or better
Ratio of internet-enabled computers to academic staff	1:5+	1:2 to 1:4	1:1 or better
Network and Internet	**Levels of Implementation**		
	Low	**Moderate**	**High**
Network specification	10 MB Ethernet or less	100 MB Ethernet	Gigabit Ethernet or better
Internet bandwidth	Dialup or broadband up to 1 MBps	Broadband, 2 to 7 MBps	Broadband, 8 MBps or better
Wireless coverage	Less than 25% of learning area	25% to 50% of learning area	More than 50% of learning area
Network/Internet performance	Slowness/unreliability a frequent problem	Generally works well, but slow at busy times	Always smooth without appreciable delay
Display Screen Technologies and Peripherals	**Levels of Implementation**		
	Low	**Moderate**	**High**
Classrooms equipped with display screen technologies	Less than 25% of classrooms	25% to 50% of classrooms	More than 50% of classrooms
Peripherals	Mostly printers.	Printers and a other peripherals such as scanners, digital cameras and audio/video recorders	A wide range of peripherals such as printers, scanners, digital cameras, audio/video recorders, portable devices, specialised devices for research and instructional purposes, computer conferencing facilities.

Software and Information Systems	Levels of Implementation		
	Low	**Moderate**	**High**
Application software	Office applications (word processing, spreadsheets, databases and presentation software)	Office applications, subject specific software, multimedia authoring and video/audio production, web tools	Office applications, subject specific software, multimedia authoring and video/audio production, web tools, collaborative and conferencing, and specialised software for instruction and research
Learning platforms	None available	Web pages on campus Intranet and learning material files stored in public folders on network	Commercial or customised open source learning management system offering a wide range of functions
Academic/student information systems	Academic/student data are stored mainly in spreadsheets and databases.	Academic/student information systems are limited to mainly registration and examination functions. Access is largely limited to administrative staff.	Academic/student information systems encompass a variety of academic/student functions. Some of the functions have become paperless. Specific functions can be access by staff and students from the Intranet/ Internet.

Table 5: Rubric for Teaching and Learning Using ICT

Learning Using ICT	**Levels of Implementation**		
	Low	**Moderate**	**High**
Using ICT as a source of information in preparing lesson plans and teaching material	ICT use involves less than 25% of courses/ academic staff	ICT use involves 25% to 50% of courses/ academic staff	ICT use involves more than 50% of courses/ academic staff
Using ICT to support learning (i.e. complementary activities typically conducted outside scheduled learning; e.g. using internet for research, word processor for assignment, etc.)	Infrequent ICT use (once a month or less) and it involves less than 25% of courses/ academic staff	Regular ICT use (once every two weeks) and it involves 25% to 50% of courses/academic staff	Frequent ICT use (once a week) and it involves more than 50% of courses/academic staff
Using ICT in a role similar to traditional classroom tool (e.g. using presentation software with display screen technology to replace the use of OHP and transparency, etc.)	Infrequent ICT use (once a month or less) and it involves less than 25% of courses/ academic staff	Regular ICT use (once every two weeks) and it involves 25% to 50% of courses/academic staff	Frequent ICT use (once a week) and it involves more than 50% of courses/academic staff
Using ICT in parallel with traditional learning (e.g. using multimedia courseware, curriculum website, computer modelling, etc. to complement traditional lecture mode)	ICT use involves less than 25% of courses/academic staff	ICT use involves 25% to 50% of courses/academic staff	ICT use involves more than 50% of courses/ academic staff
Using ICT to enable flexible learning (e.g. e-learning for independent, self-paced, flexible time, remote location learning)	ICT use (at least for specific modules) involves less than 25% of courses	ICT use (at least for specific modules) involves 25% to 50% of courses	ICT use (at least for specific modules) involves more than 50% of courses
Communicating Using ICT	**Levels of Implementation**		
	Low	**Moderate**	**High**
Using ICT as a means of academic related communication/ discussion between students and academic staff.	ICT use involves less than 25% of students/academic staff	ICT use involves 25% to 50% of students/ academic staff	ICT use involves more than 50% of students/ academic staff
Using ICT as a means of	ICT use involves	ICT use involves	ICT use involves

academic related communication/discussion between academic staff.	less than 25% of academic staff	25% to 50% of academic staff	more than 50% of academic staff
Assessing Students Using ICT	**Levels of Implementation**		
	Low	**Moderate**	**High**
Online submission of work	ICT involves less than 25% of courses	ICT involves 25% to 50% of courses	ICT use involves more than 50% of courses
E-portfolio/ e-presentation	ICT involves less than 25% of courses	ICT involves 25% to 50% of courses	ICT use involves more than 50% of courses
Online test/examination	ICT involves less than 25% of courses	ICT involves 25% to 50% of courses	ICT use involves more than 50% of courses

Table 6: Rubric for Researching Using ICT

Collecting and Processing Research Data	**Levels of Implementation**		
	Low	**Moderate**	**High**
Using Internet and online resources as source of research information	ICT involves less than 50% of research projects	ICT involves 50% to 75% of research projects	ICT use involves more than 75% of research projects
Using ICT as a means to collect data (e.g. online survey, web logs and tracking tools, interviews via e-mail, etc.)	ICT involves less than 25% of research projects	ICT involves 25% to 50% of research projects	ICT use involves more than 50% of research projects
Using ICT (computer hardware and software) to process/analyse research data	ICT involves less than 50% of research projects	ICT involves 50% to 75% of research projects	ICT use involves more than 75% of research projects
Managing and Publishing Research Information	**Levels of Implementation**		
	Low	**Moderate**	**High**
Using ICT to manage and document research projects	ICT involves less than 50% of research projects	ICT involves 50% to 75% of research projects	ICT use involves more than 75% of research projects
Using ICT to communicate and collaborate between research project members	ICT involves less than 25% of research projects	ICT involves 25% to 50% of research projects	ICT use involves more than 50% of research projects
Using ICT to share, disseminate and publish research data/findings	ICT involves less than 50% of research projects	ICT involves 50% to 75% of research projects	ICT use involves more than 75% of research projects

Table 7: Rubric for ICT Information Services

Academic Information	**Levels of Implementation**		
	Low	**Moderate**	**High**
Academic/student information	Institutional website provides only a very	Institutional website provides general	Institutional website provides a wide

accessible online	brief listing of academic programmes on offer.	academic information such as programme structure and requirements, and description of courses.	variety of information, including a detail description of programmes and courses, as well as other academic/ student related information such as academic calendars, activities and announcements.
Learning Materials and References	**Levels of Implementation**		
	Low	**Moderate**	**High**
Learning support materials accessible online	Learning support materials accessible online involve less than 25% of courses	Learning support materials accessible online involve 25% to 50% of courses	Learning support materials accessible online involve more than 50% of courses
Online journals/ databases	Access to online journals and databases is very limited and they are accessible only from the library.	Access to online journals and databases covers many related fields of study and they are accessible from the library and certain computers within campus.	Access to online journals and databases covers all related fields of study and they are sufficiently accessible by staff and students from within and outside campus.

Table 8: Rubric for Institutional ICT Support

ICT Skill Development	**Levels of Implementation**		
	Low	**Moderate**	**High**
Integration of ICT literacy in the curriculum	ICT literacy is included as a separate unit/course in the curriculum and is compulsory for some of the programmes being offered.	ICT literacy is included as a separate unit/course in the curriculum and is compulsory for many of the programmes being offered.	ICT literacy is included as a separate unit/course in the curriculum and is compulsory for all of the programmes being offered.
ICT skill development for academic staff	ICT skill development involves less than 25% of academic staff.	ICT skill development involves 25% to 75% of academic staff.	ICT skill development involves more than 75% of academic staff.
Technical ICT Support	**Levels of Implementation**		
	Low	**Moderate**	**High**
Ratio of technical ICT support staff to computer labs/areas	1:6+	1:3 to 1:5	1:2 or better
Efficiency of technical ICT support	ICT tasks and problems are seldom resolved in a timely and efficient manner.	ICT tasks and problems are not always resolved in a timely and efficient manner.	ICT tasks and problems are always resolved in a timely and efficient manner.
Scope of technical ICT assistance	Support for ICT users is available when requested, but limited to resolving hardware problems and software installations.	Ongoing support for ICT users is readily available, limited to resolving hardware problems, software installations and the general ICT use in common applications.	Ongoing support for ICT users is readily available, encompassing hardware, software, general ICT use and specific ICT development/use in teaching/learning and research environment.

SUMMARY AND CONCLUSION

Literature review has revealed the complex organisation of academic computing and the need to cluster and labelled them into common areas. There are variations in these areas, due to the variations in its organisation and scope implemented at different higher education institutions. Nevertheless, academic computing can be represented by six broad

areas, namely 1) Teaching and Learning Using ICT; 2) Researching Using ICT; 3) ICT Vision, Plan, Policies and Standards; 4) ICT Infrastructure; 5) ICT Information Services; and 6) Institutional ICT Support.

In implementing academic computing, higher education institutions may focus on certain areas while overlooking others. This may cause imbalance of academic computing and may result in ineffective implementation. This research is an effort to describe the areas and components that are crucial to the successful implementation of academic computing. Further research needs to be undertaken to understand higher education academic computing, especially for the Malaysian context.

Each of the assessment frameworks described in this paper displays specific strengths and limitations. The most obvious limitation is that many of the frameworks do not take into account the unique features of Malaysian higher education. As a result, the frameworks can be used to measure certain aspects of academic computing, but the validity of the measured items is questionable.

To develop an academic computing assessment framework for Malaysian higher education, a model is proposed using the value chain approach. The model includes all six academic computing areas as well as components of each area. To implement the model, a case study was conducted on five higher education institutions in Malaysia. Performance indicators that differentiate the levels of academic computing implementation are used to populate the model. The researcher then proposes assessment rubrics describing the characteristics for different levels of academic computing implementation. The rubric would be used as the basis of a survey questionnaire. For the purpose of benchmarking, a centralised effort is needed to organise and implement a nationwide survey involving the more than four hundred higher education institutions in Malaysia. The survey information can be used to identify the general state of academic computing and its patterns of implementation. This information can assist higher education institutions in providing quality education to fulfil the various needs in the country and remain competitive in a global knowledge industry.

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STUDENTS' PERCEPTIONS OF CAMPUS CULTURE IN A CHINESE UNIVERSITY

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ABSTRACT

Campus culture has been the subject of a number of institutional research projects in developed countries such as the USA. Some of these have focused on the corporate culture that focuses on furthering the understanding of how institutional decisions and actions are made, whilst other studies consider the supportive nature of internal cultures regarding the achievement of organisational goals and strategies. The latter is very important, particularly in relation to the enhancement of the University's mission concerning learning and teaching. Yet such studies are rare within the Asian region. The present institutional research aims to at least partially address the dearth of institutional research on the topic by considering campus culture and possible effects on the learning and teaching of English language at a Chinese University. It suggests some changes in the cultural environment in order to improve the effectiveness of learning of English within this Asian country.

INTRODUCTION

Shi (1999) indicates that after being closed to the outside world for thirty years, China implemented its reform and open door policies under the Deng Xiaoping administration. The effects of these reforms also penetrated the Chinese universities that hitherto had been isolated from the outside world. Shi (1999) further observes that these reforms have heralded dramatic changes in the campus culture within the Chinese higher education sector. Partially such changes have resulted from the recruitment of academic staff from developed countries for the teaching of the English language and British and American literature.

The foregoing changes have also permeated the Case Study University that is located in Wenzhou, P.R. China. The Wenzhou University was founded at the time when the reform and open policy was initially implemented in Wenzhou, which had contributed to the campus culture of adaptiveness and entrepreneurship at Wenzhou University. The reform and open policy had seen the City of Wenzhou become a production centre of light industrial products such as shoes, garments, lighters and glasses. A large number of these products were exported to many parts of the world. This has led to the need for English speaking personnel to do international business in local factories. Wenzhou University has responded to this demand by sending competent English speaking graduates to Wenzhou enterprises since its early stage of establishment.

The cultural changes marked by the introduction of Deng Xiaoping's economic and political reforms have also influenced Wenzhou University. In particular, this University

realised some time ago that with globalisation and English becoming the effective international language, student's knowledge and career aspirations could be improved by exposing them to the English language. Wenzhou has recruited a number of foreign teachers of English in order to complement other Chinese staff that were educated in English-speaking western countries. This change in the educative process has been in place for some 6 years. The University believes that it is now time to study the influences emanating from cultural changes on the learning and teaching of English on campus. Indeed this is the major focus of the current study.

LITERATURE REVIEW

Bodley (1994) indicates that the modern definition of culture refers collectively to a society and its way of life. He suggests that culture has at least three components: what people think what they do and the material they produce. Bodley (1994) believes that mental processes, beliefs, knowledge and values are parts of a culture.

Warters (1995) identifies some cogent reasons for the study of campus culture. He suggests that while institutions are influenced by powerful external factors such as demographic shifts, economic changes and political realignments, they are also shaped by strong internal forces including the campus culture. He observes that while the study of organisational culture has become quite common in organisational research on businesses, there remains a relative lack of organisational culture research on higher education. It is contended that this is particularly the case in developing countries such as China.

The American Association of State Colleges and Universities (Undated) suggests that campus culture may play an important role in the retention of University students. In particular, their study found three key elements of study campus culture on the campuses that were more successful in the retention of their students including a pervasive attitude that all students can succeed, a sense of inclusiveness of all students on campus and a strongly held sense of institutional mission that recognises the campus as being distinctive or special. They suggest that institutions ought to invest in the focusing of the campus culture on values and behaviours that lead to student success if they are to retain their students.

Goldberg (2001) appears to advocate changing the campus culture so as to focus on the formation of discrete, campus constituencies into learning communities in order to ease the shock of transition to and the continuing demands of university life. It is noted that the commencing university students face large changes in the transition from secondary schools to higher education and indeed some have observed relatively large student attrition rates in the first year. Goldberg (2001) suggests that the task of re-creating the university will remain unfinished unless each classroom becomes a learning community in microcosm. He proposes that this requires professors to enlist to mentor campus cultural change so as to promote interactive learning and vigorous discussion in the classrooms.

METHODOLOGY

The basic aims of the research project included:

1) The perceived importance and achievement of certain campus cultural characteristics for the Chinese University.
2) Student qualitative perceptions, including possible suggestions as to how the campus cultural environment can be improved in the future.

The above research goals were addressed by designing a student survey instrument based on a literature search (see above). The survey questionnaire included four sections, including demographic and related student characteristics, importance of certain cultural dimensions, their perceived student satisfaction and qualitative suggestions by students on the strengths and weaknesses of the current campus culture and strategies for future improvements.

200 students from Wenzhou University were selected to participate in the survey. The students were selected according to their discipline and year of program for the purpose of convenience and comparison. The sample include 50 first-year Chinese Literature students, 50 second-year Mechanical Engineering students, 50 third-year Business Administration students and another 50 forth-year English students. Among the 200 questionnaires distributed, 120 fully completed questionnaires were returned, giving a response rate of 60%. The respondents covered all the four previously mentioned disciplines and years, which provides data for cross discipline and year comparison. However, as the sample size was relatively small and was not randomly selected, the survey result should be regarded as being indicative of the students under survey, and may not sufficiently represent the viewpoint of all the students at Wenzhou University. This limitation ought to be considered when interpreting the results of the survey. However, it is contended that given the dearth of past research on this topic, this study should be regarded as being hypotheses generating rather than actual testing of propositions. Further, the readers attention is drawn to the next section that identifies demographic characteristics of the sample and where possible, its congruence with the total population of students.

QUANTITATIVE STUDENT SURVEY ANALYSIS

Demography and Related Characteristics

As previously stated, a total of 120 Chinese University students responded to the survey of campus culture and related aspects. The majority of respondents were female students (55%) and this is consistent with this gender's domination of the English language programs at the Chinese higher education institution. Similarly a majority of students (56%) were relatively young being less than twenty two years' old; this is in keeping with the mainly school leaver intake into the case study University. Approximately a quarter of students were drawn from the four major disciplines covered by the survey including

Chinese Language, Business Administration, English and Engineering- suggesting a well-balanced sample of responding students. Nearly 90% of the respondents were commencing students suggesting an under-representation of returning or re-enrolling students in the sample; this constitutes a limitation of the study. A large majority (85%) of respondents were drawn from the middle class, with 12% from the lower socio-economic group and only 3% from the higher socio-economic status; while this may appear to be a very skewed sample, given the recent giant leap in economic growth of the Chinese nation, the dominance of the middle class within an urban environment is not particularly surprising. Nearly 60% of the respondents resided with their family during the semester; this is in keeping with the relatively young student population on campus and the majority of students being drawn from the city where the University is located. Approximately two-thirds of the respondents sustained an average English language assessment score of up to 80% in the previous University term; interestingly the modal score range for English was 81-90% that was achieved by nearly 15% of the respondents.

Perceived Importance of Campus Culture and Related Issues

Table 1below provides the perceived students' importance of the campus environment using a five point scale ranging from strongly disagree (1) to strongly agree (5). The following comments and observations are made on the mean perceived importance of the campus culture and related factors contained in Table 1:

- Students regarded most of the items as being important (scores ranging from 3.5-4.0) but there were a few cultural and related factors that were regarded with a degree of ambivalence including campus staff being welcoming towards the student, campus students being welcoming to the respondent, students being friendly or supportive towards others, the respondent was likely to drop out from the University program, students being familiar with the campus environment, relationships were well-defined on campus (including strong hierarchies), respondents feeling a sense of shame if they do not achieve their goals and students purchasing learning resources for English studies.
- The top items in terms of mean ranking included the perception that the students were very likely to complete their programs; the campus environment was conducive to learning and the students' perseverance in the pursuit of their goals.
- However, the bottom three areas in terms of campus culture and the related environment (as measured by the mean value) included the perceived lack of welcoming students by staff on campus, the likelihood of students dropping out from programs prior to completion (a positive outcome) and the students' purchasing learning resources for the study of University English.

Table 1: Perceived Importance of Campus Culture and Related Issues

Item	Mean	Standard Deviation
Student very likely to complete program	3.93	0.96
Campus environment conducive to learning	3.86	0.90

Item	Mean	Standard Deviation
Persevere in pursuing goals	3.78	0.89
Differences in opinion respected	3.74	1.00
Frequent academic/peer communication improves thinking, reading and writing	3.74	0.84
Prevent students' indulgence in on-line games	3.74	1.01
Feel safe on campus	3.72	0.97
Students use multi-media in learning English	3.66	0.84
English teachers should use multi-media in classes	3.65	0.84
Face to face conferencing improves learning of English	3.65	0.84
Attached to University campus environment	3.62	0.96
Use of multi-media enhances comprehension of English	3.62	0.70
Academics treat me the same as other students	3.57	0.89
Devote energies in learning English	3.56	0.88
On-line learning improves learning of English	3.55	0.80
Spend extra time in learning English	3.54	0.88
Respected by students and staff	3.54	0.93
Staff very supportive	3.53	0.92
Socialise with other students	3.51	0.77
People on campus very helpful	3.50	0.83
Familiar with campus environment	3.47	0.70
Students very supportive	3.45	0.78
If don't achieve goals have a sense of shame	3.44	0.80
Campus students very welcoming	3.44	0.77
Relationships well defined including strong hierarchies	3.41	0.93
Students very friendly	3.36	0.96
Purchased learning resources for English	3.30	0.77
Student very likely to drop out from program	3.21	1.34
Campus staff very welcoming	3.18	0.80

The importance of the campus environment can be mitigated by a number of independent variables, such as gender, age, discipline, whether the student is commencing or re-enrolling in their program and their socio-economic status and the students' residential status during the semester. In order to enhance the understanding of the possible relationships between these independent variables some non-parametric tests were undertaken with the statistically significant results highlighted below.

Gender: Pearson Chi-square analysis was undertaken to ascertain if male and female students differed in their perceived sense of the importance of the campus culture and related issues. It was observed that female students (42%) were more likely to accord importance to being welcomed on campus by academic staff than was the case with their male counterparts (15%, Chi-square=12.9, $p<0.05$). Similarly the female students (49%) were more likely to regard support from campus students as important to them than was the case with male students (35%, Chi-square=9.51, $P<0.05$). Again women were more

inclined to accord importance (78%) to the nature of the learning and teaching environment than men (60%, Chi-square=11.5, $p<0.05$). Similarly, female students (78%) assigned greater importance to the completion of their current University program than was the case with male respondents (60%, Chi-square=13.8, $p<0.01$). Women (66%) also accorded a greater importance to being treated equally as well as other students by academic staff than was the case with men (40%, Chi-square=13.3, $p<0.01$). The respecting of the differences in opinion and viewpoints on campus was also of greater importance to female students (77%) than was the case with male students (40%, Chi-square=18.8, $p<0.001$). Campus safety was a more important issue for women (74%) than was the case with men (42%, Chi-square=15.3, $p<0.01$). Being respected by students and staff was of greater importance to female students (71%) than was the situation with male respondents (30%, Chi-square=23.5, $p<0.001$). Women (62%) sustained a greater importance being accorded to the helpfulness of people on campus than was the case with men (34%, Chi-square=19.2, $p<0.001$). Similarly women (54%) were more likely to assign greater importance towards clearly defined relationships with the observation of strong hierarchies on campus than men (34%, Chi-square=9.5, $p<0.05$). Female students (69%) were nearly twice as likely to assign importance in spending extra hours in the learning of English language as their male counterparts (36%, Chi-square=16.0, $p<0.01$). Women (68%) believed that it was more important to use multi-media in the teaching of English than was the case with men (43%, Chi-square=11.7, $p<0.01$). Similarly female students (68%) assigned greater priority to the academic staff arranging face-to-face conferencing than was the case with male respondents (42%, Chi-square=11.6, $p<0.05$). Women (74%) were more likely to believe that frequent instructor/peer communication in online environments improved their abilities to think, read and write than was the case with men (42%, Chi-square=13.7, $p<0.01$). Finally female respondents (71%) accorded greater importance to the implementation of measures to prevent students' indulgence in online games than was applicable to male students (49%, Chi-square=15.9, $p<0.01$).

Age: A similar analysis on perceived importance of campus environment was undertaken for age. Pearson Chi-square indicated only one statistically significant result, in particular, adult students (those 21 years or older-39%) were less likely to accord importance to the University staff being very supportive towards them and their learning on campus than was the case with the younger counterparts (64%, Chi-square=35.0, $p<0.05$).

Discipline: The analysis on perceived importance of the campus environment was replicated with respect to the discipline of the students. Pearson Chi-square statistical test suggests that discipline is an important variable concerning whether the staff were welcoming to the students on campus, in particular, it was found that this issue was regarded as being more important to those studying the Chinese Language (47%) and English (43%) than was observed in respect of Business Administration (7%) and Mechanical Engineering students (23%, Chi-square=21.7, $p<0.05$). Further, the Chinese Language students (70%) assigned a greater priority towards campus support by students than those drawn from the Business Administration (28%), English (28%) and Mechanical Engineering (40%, Chi-square=25.9, $p<0.05$). Similarly the Chinese Language students (73%) felt that it was more important to have supportive university

staff in terms of their learning in comparison to those drawn from the other disciplines including Business Administration (33%), English (39%) and Mechanical Engineering (50%, Chi-square=37.5, $p<0.001$). Again the Chinese Language students (87%) accorded a greater priority for having a conducive campus environment for teaching and learning than was the case with Business Administration (63%), English (64%) and Mechanical Engineering students (67%, Chi-square=22.9, $p<0.05$). Interestingly, the Chinese Language students (93%) assigned a greater importance to the completion of their program than others drawn from Business Administration (59%), English (61%) and Mechanical Engineering (67%, Chi-square=24.7, $p<0.05$). In a similar way feeling safe on campus was of greater importance to the Chinese Language students (90%) relative to the others drawn from Business Administration (43%), English (68%) and Mechanical Engineering (37%, Chi-square=29.1, $p<0.01$). Again the Chinese Language students (90%) assigned greater priority to being respected by students and staff on campus than was the case with Business Administration (40%), English (57%) and Mechanical Engineering respondents (23%, Chi-square=37.9%, $p<0.001$). Similarly the Chinese Language students (80%) felt that on-campus people ought to be very helpful in contrast to students from Business Administration (27%), English (58%) and Mechanical Engineering (40%, Chi-square=34.2, $p<0.001$). Not surprisingly, the Chinese Language (70%) and English students (62%) believed that devoting additional efforts to the learning of English Language was of greater importance than the perception of Business Administration (43%) and Mechanical Engineering respondents (38%, Chi-square=24.7, $P<0.05$). The use of multi-media in English Language classes was accorded a greater importance by Chinese Language students (80%) relative to those enrolled in Business Administration (47%), English (54%) and Mechanical Engineering (47%, Chi-square=18.5, $p<0.05$).

Commencing and Re-enrolling: Again the Pearson Chi-square analysis was replicated in respect to whether the students were commencing or re-enrolling in their program. It was found that this variable was only statistically significant regarding the importance of the use of multi-media to enhance the comprehension and learning, in particular, this item was accorded a greater priority by commencing students (55%) than was the case with returning students (45%, Chi-square=12.8, $p<0.05$).

Socio-economic Background: The Pearson Chi-square analysis was applied to the socio-economic status of students at the Chinese University. Respondents drawn from the lower socio-economic group assigned a lesser importance to on-campus students being friendly (29%) than was the case with either the medium (46%) or higher (67%) socio-economic groups (Chi-square= 25.3, $p<0.001$). Similarly those drawn from the middle (60%) and higher social status (67%) assigned greater importance in respect to their attachment to the university campus environment than was observed for the respondents drawn from the lower socio-economic group (54%, Chi-square=15.8, $p<0.05$). Again those from either the middle (70%) or high (67%) social status groups accorded greater importance to the overall campus environment being conducive to learning and teaching relative to respondents drawn from the lower socio-economic status (64%, Chi-square=29.0, $p<0.001$). Respondents drawn from either the low (36%) or medium socio-economic status (46%) were more likely to accord importance to dropping out from their

program than was applicable to the high social status group (0%, Chi-square=21.4, $p<0.01$). Students from the middle (61%) and high (67%) socio-economic status assigned greater importance to opinion and viewpoints being respected on campus relative to their counterparts drawn from the low social group (57%, Chi-square=25.9, $p<0.001$). Being respected by students and staff on campus was considered less important by the low social group (29%) relative to their peers emanating from either the middle (55%) or high (67%, Chi-square=25.0, $p<0.01$) socio-economic status. Finally the medium socio-economic group (60%) stressed the importance of using multi-media in English language classes relative to the low (36%) and high social groups (33%, Chi-squared= 22.2, $p<0.001$).

Residing with Family: The Pearson Chi-square analysis was applied to the students' perceived importance of the on-campus cultural and related issues according to whether they reside with the family during the academic semester; however, no statistically significant results were obtained.

Perceived Satisfaction with Campus Culture and Related Issues

In addition to seeking students' perceptions of the importance of the Chinese University campus culture, the survey questionnaire also sought their satisfaction with this environment using a five point Likert scale (1= strongly disagree and 5= strongly agree). Table 2 provides the central tendency in respect to students' perceptions of the campus culture and related issues. The following are the key observations on the data contained in this table:

- Overall with some minor exceptions, the mean scores tend to oscillate close to 3 meaning that the students tended to reveal a degree of ambivalence regarding their satisfaction with the various campus culture and related issues. Indeed there was only one item where the students tended to disagree with the cultural factors listed in Table 2 (mean value less than 2.5), namely, it is fortunate that overall they disagreed that they were likely to discontinue their current academic program.
- Nevertheless, the top three factors generating the most satisfaction included the likelihood that students will complete their program, the campus students were supportive of the respondents and the campus students were very welcoming towards the respondents.
- Excluding the student drop out issue (that was in fact a positive outcome) the greatest dissatisfaction is noted regarding whether the campus environment was conducive to learning, measures ought to be taken to prevent students' indulgence in on-line games, differences in opinion and viewpoints should be respected on campus and feeling safe on campus.

Table 2: Students' Perceived Satisfaction with the Campus Culture & Related Issues

Item	Mean	Standard Deviation
Student very likely to complete program	3.47	0.98
Students very supportive	3.45	2.82

Item	Mean	Standard Deviation
Campus students very welcoming	3.35	0.63
Socialise with other students	3.31	0.83
English teachers should use multi-media in classes	3.24	0.74
Persevere in pursuing goals	3.24	0.74
Students very friendly	3.17	0.74
Familiar with campus environment	3.14	0.90
Academics treat me the same as other students	3.14	0.81
Use of multi-media enhances comprehension of English	3.14	0.74
Relationships well defined including strong hierarchies	3.11	0.85
Students use multi-media in learning English	3.11	0.77
On-line learning improves learning of English	3.08	0.78
If don't achieve goals have a sense of shame	3.07	0.73
Staff very supportive	3.04	0.83
Campus staff very welcoming	3.03	0.71
Respected by students and staff	3.00	0.76
Attached to University campus environment	2.96	0.93
Face to face conferencing improves learning of English	2.96	0.84
Frequent academic/peer communication improves thinking, reading and writing	2.96	0.78
Purchased learning resources for English	2.96	0.84
Devote energies in learning English	2.91	0.91
People on campus very helpful	2.85	0.77
Differences in opinion respected	2.84	0.95
Feel safe on campus	2.84	0.92
Spend extra time in learning English	2.84	0.93
Prevent students' indulgence in on-line games	2.81	0.93
Campus environment conducive to learning	2.76	1.02
Student very likely to drop out from program	2.48	1.15

The satisfaction with the campus environment can be effected by a number of independent variables as was the case with the previously mentioned perceived importance of the cultural factors. Again non-parametric analysis was undertaken, identifying the statistically significant results as detailed below.

Gender: The Pearson Chi-square analysis was applied to the students' satisfaction with the campus environment to identify any statistically significant differences in perception regarding the gender of the respondents. A greater percentage of female students (71%) were broadly satisfied (including those selecting 3 on the Likert scale) with the conducive teaching and learning environment on campus relative to male students (53%, Chi-square=9.61, $p<0.05$). Similarly women (79%) expressed greater

satisfaction with measures taken to prevent students' indulging in on-line gambling than was the case with men (60%, Chi-square=16.8, $p<0.01$).

Age: The above analysis was replicated with respect to the respondents' age. The youngest group at eighteen years of age (100%) and the 22 age group of students (78%) were more broadly satisfied with the conducive nature of the campus learning and teaching environment than was the case with the other age groups including 19 years (58%), 20 years (56%), 21 years (60%) and those aged 23 years or older (56%, Chi-square=40.8, $p<0.01$). The youngest age group (18 years) were less broadly satisfied (40%) with their socialisation on campus than was the case with the older age group (89%, Chi-square=41.6, $p<0.01$). The younger age group (18 or 19 years) were less satisfied (broadly) with the campus and local city environment (44%) than was the case with the older age group (86%, Chi-square=33.6, $p<0.05$).

Discipline: The Pearson Chi-square analysis was undertaken regarding the students' discipline and satisfaction with the University's campus culture. It suggests that the Mechanical Engineering students were less likely to be broadly satisfied (73%) with the friendliness of the campus students than was the case with the Chinese Language students (93%), Business Administration (97%) and English program respondents (90%, Chi-square=21.6, $p<0.05$). Similarly the Mechanical Engineering respondents (55%) were less broadly satisfied with their attachment to the campus than was observed with respect to the Chinese Language (83%), Business Administration (72%) and English students (79%, Chi-square=29.9, $p<0.01$). Again the Mechanical Engineering students (43%) tended to be less broadly satisfied with the conduciveness of the campus learning and teaching environment than was applicable to the Chinese Language (73%), Business Administration (70%) and English students (66%, Chi-square=33.9, $p<0.001$). In broad terms, Chinese Language students (55%) were less satisfied with their familiarity with the city and campus environment relative to Business Administration (90%), English (93%) and Mechanical Engineering respondents (83%, Chi-square=29.3, $p<0.01$). Similarly the Chinese Language students were broadly less satisfied (40%) with the time they spent on learning the English Language relative to those enrolled in Business Administration (69%), English (83%) and Mechanical Engineering respondents (67%, Chi-square=26.5, $p<0.01$). Business Administration students (93%) were more broadly satisfied by the English program academics initiated instructor/peer communication to improve their abilities of thinking, reading and writing in comparison to Chinese Language (60%), English (71%) and Mechanical Engineering respondents (73%, Chi-square=21.7, $p<0.05$). Finally, again discipline appears to be an important variable regarding satisfaction with measures taken to prevent students indulgence with on-line games with the Chinese (73%) and English language programs (86%) expressing greater broader satisfaction with this factor than applicable to either the Business Administration (63%) or Mechanical Engineering respondents (60%, Chi-square=22.6, $p<0.05$).

Commencing and Re-enrolling: The Pearson Chi-square analysis was applied to whether the student was new to the program at the Chinese higher education institution and the respondents perceived satisfaction with the cultural environment. Only one statistically significant result was observed. In particular, the re-enrolling students (36%)

were more likely to feel a sense of shame if they did not achieve their goals than was the case with the commencing students (21%, Chi-square= 19.7, $p<0.05$). Even in this case if one includes the neutral category (3) than the percentage "broadly agreeing" with this statement were very similar- 86% of the commencing students expressing broad agreement in comparison to re-enrolling students (82%).

Socio-economic Background: Again the Pearson Chi-square analysis was replicated with respect to the socio-economic status of the respondents. It was found that the low social group (31%) expressed a lesser broad satisfaction with their attachment to the University campus environment relative to the middle (78%) and high (67%) socio-economic status students (Chi-square=20.0, $p<0.01$). The middle social group (93%) were more broadly satisfied with their prospects to complete the current program than either the high (67%) or low socio-economic status students (71%, Chi-square=19.0, $p<0.05$). In terms of whether the differences in opinion and viewpoint were respected at the University, the middle (75%) and high social groups (67%) were more broadly satisfied with this cultural factor than was observed with the low socio-economic students (29%, Chi-square=18.4, $p<0.05$). Similarly the low social group (43%) were less broadly satisfied with the helpfulness of people on campus relative to their counterparts drawn from the middle (76%) and high socio-economic status respondents (67%, Chi-square=16.1, $p<0.05$). Again the middle (75%) and high (67%) social groups were more satisfied with the measures taken to prevent students' indulgence in on-line games relative to students from the low socio-economic status (36%, Chi-square=23.2, $p<0.01$).

Residing with Family: Finally the Pearson Chi-square analysis was applied to assess the possible association between students' broad satisfaction with the campus environment and whether they resided with the family during the semester. It was found that those residing with their family during the academic semester (96%) expressed greater satisfaction with the University students being very friendly on campus than the other students (79%, Chi-square= 9.8, $p<0.05$). Similarly, students residing with their family during the semester (80%) were more satisfied with measures taken to prevent students' indulgence in on-line games than was the case with the other respondents (56%, Chi-square=11.5, $p<0.05$).

The mean importance and mean satisfaction with the cultural factors, as contained in Tables 1 and 2 above, were compared statistically (see Table 3). In only one case, namely, the respondents' perception regarding whether the campus students were supportive, the mean importance and satisfaction were identical. Four other cultural factors were not found to produce statistically significant differences between mean importance and satisfaction; these include the students and staff being welcoming towards the respondents, the other students were friendly and the socialising with other students on campus. All other campus cultural factors resulted in a statistically significant difference between the two dimensions; in particularly in all these cases the mean importance was significantly greater than the perceived satisfaction. The widest gap between importance and significance were noted in respect of the following items:

? The campus environment was conducive to learning (-40%)

- ? The taking of measures to prevent students' indulgence in on-line learning (-33%)
- ? The respecting of differences in opinion and viewpoints (-32%)
- ? Feeling safe on campus (-31%)

Clearly the University will need to initiate some remedial action in these four cases and perhaps others.

Table 3: Differences in Mean Importance and Satisfaction with the Campus Cultural Environment

Item	Mean Difference Difference % Gap	T Value Probability
Students very supportive	0 0%	0 >0.05
Campus students very welcoming	-0.09 -2.7%	-0.99 >0.05
Campus staff very welcoming	-0.15 -5.0%	-1.52 >0.05
Students very friendly	-0.19 -6.0%	-1.71 >0.05
Socialise with other students	-0.20 -6.0%	-1.91 >0.05
Relationships well defined including strong hierarchies	-0.30 -9.6	-2.59 <0.01
Familiar with campus environment	-0.33 -10.5%	-3.15 <0.01
Purchased learning resources for English	-0.34 -11.5%	3.23 <0.01
If don't achieve goals have a sense of shame	-0.37 -12.1%	-3.73 <0.001
English teachers should use multi-media in classes	-0.41 -12.7%	-3.97 <0.001
Student very likely to complete program	-0.46 -13.3%	-3.64 <0.001
Academics treat me the same as other students	-0.43 -13.7%	-3.90 <0.001
Use of multi-media enhances comprehension of English	-0.48 -15.3%	-5.12 <0.001
On-line learning improves learning of English	-0.47 -15.3%	-4.58 <0.001
Staff very supportive	-0.49 -16.1%	-4.29 <0.001
Persevere in pursuing goals	-0.54 -16.7	-5.07 <0.001
Students use multi-media in learning English	-0.55 -17.7%	-5.23 <0.001
Respected by students and staff	-0.55 -	-4.98 <0.001

Item	Mean Difference Difference % Gap	T Value Probability
	18.4%	
Devote energies in learning English	-0.65 - 22.3%	-5.57 <0.001
Attached to University campus environment	-0.66 - 22.3%	-5.32 <0.001
People on campus very helpful	-0.65 - 22.8%	-6.24 <0.001
Face to face conferencing improves learning of English	-0.69 - 23.3%	-6.32 <0.001
Spend extra time in learning English	-0.70 - 24.6%	-5.93 <0.001
Frequent academic/peer communication improves thinking, reading and writing	-0.78 - 26.4%	-7.39 <0.001
Student very likely to drop out from program	-0.73 - 29.4%	-4.48 <0.001
Feel safe on campus	-0.88 - 31.0%	-7.17 <0.001
Differences in opinion respected	-0.90 - 31.7%	-7.06 <0.001
Prevent students' indulgence in on-line games	-0.93 - 33.1%	-7.35 <0.001
Campus environment conducive to learning	-1.10 - 39.9%	-8.83 <0.001

Correlation Analysis

An important consideration for institutional researchers relates to students transition factors. Accordingly, correlation analysis was undertaken on the likelihood that the students will either complete their programs or drop-out from them prior to successful completion. The following statistically significant results were obtained in relation to the satisfaction issues and the two transition factors:

? The likelihood of completing the current program was highly positively correlated (at $p<0.01$ level) with perceived satisfaction concerning the welcoming nature of students on campus ($r=0.30$), the friendliness of students ($r=0.49$), supportive nature of staff ($r=0.27$), attachment to the campus environment ($r=0.39$), fair treatment by academic staff ($r=0.25$), familiarity with city and campus environment ($r=0.33$), respect for difference in opinion and viewpoints ($r=0.34$), feeling safe on campus ($r=0.43$), being respected by students and staff ($r=0.41$), helpfulness of people on campus ($r=0.28$), perseverance in pursuing goals ($r=0.30$), and well defined hierarchies of relationship ($r=0.25$).

- On the other hand, the likelihood of dropping out from the program was highly positively correlated with familiarity with the campus and city environment (r=0.28), feeling safe on campus (r=0.30), being respected by students and staff on campus (r=0.34), well defined hierarchy of relationship (r=0.27), feeling a sense of shame if don't achieve their goals (r=0.28), devoting additional energies in the learning of English (r=0.27), spending extra time in learning English (r=0.41), and spending money to purchase learning resources for English (r=0.31).
- Although the correlation factors intuitively make sense in respect to the likelihood of course completion, they do not appear to be meaningful regarding the probability of dropping out from the program. Is it possible that the latter correlations are of the non-sensical variety? For instance, it is difficult to understand why students who feel safe on campus are likely to drop out from their program (unless such students are physically strong and can defend themselves but somewhat disinterested in their studies!).

Given the importance of course completions as a positive outcome from the University, multiple regression analysis was undertaken, using it as the dependent variable with the satisfaction factors as independent variable. Table 4 summarises the outcome of this analysis. It suggests that the two significant predictors of the positive outcome relate to students being friendly on campus and they felt safe on campus. The model contained in Table 4 explains around 33% of the variance in the dependent variable.

Table 4: Regression Model for Program Completion

Variable	Standardised Beta	T statistics	Probability
Constant	N.A.	2.197	0.03
Students are friendly on campus	0.402	5.086	0.000
I feel safe on campus	0.324	4.091	0.000

QUALITATIVE SURVEY ANALYSIS

The present study also invited the participants to answer the following questions: 1. What constitutes the strengths of the current campus culture at Wenzhou University? 2. What are the main weaknesses of the current campus culture at Wenzhou University? 3. How can the campus environment and culture be improved in the future? 4. What changes are required to the current campus culture to enhance your learning of English? As to the first question, 91 students replied, 72 of who considered Wenzhou University carries the following strengths of current campus culture:

1. Beautiful campus, good learning environments, multi-cultural, and abundant learning resources available in the library.
2. Flexible teaching methods that stress the integration of teaching with social practice in the individually-run businesses in Wenzhou city; students' growth of individuality and freedom; educate students around the positive school-running

goals; support students' work in businesses; provide ample seminars on campus to broaden students' horizons; and organize adequate entertainment programs.

3. The campus atmosphere promotes the business culture, and entrepreneurial spirit.
4. Various activities such as "Oral English Contest" are provided outside curricula , and good facilities for PE education are available to students. Students are active in PE exercises, keep good relationships with each other, and respect others; the staff are patient, ready to help students, and understand students in every aspects.

The other 26 students insisted there is no signs of the strengths of the current campus culture, or that the campus culture is featured as romantic web-game culture, weak in academic atmosphere, but strong in business-like management.

Except for 18 students who didn't answer the second question, 102 of the respondents regarded the following as the main weaknesses of the current campus culture:

1. Students' lack of learning autonomy and motivation; weakness in learning atmosphere; inadequate communication between students and the staff; and lack of opportunities to practise the English language on and off campus.
2. The inadequate supplies of teaching equipment such as computer rooms; the draught problem of the library; the noise on the construction site close to the classrooms; and food quality in the cafeteria.
3. The out-dated teaching content; the traditional teaching methodology; and the inadequate number of foreign staff to particularly expedite the learning of spoken English by students.
4. Students' inadequate focus on learning; unawareness of campus culture; school rules and regulations; and indifference to school activities.

Though 27 students didn't say anything about the third question, 93 provided their suggestions as the following for the improvement of campus environment and culture in the future:

1. Organize more English activities (eg, English Culture Week, English movie shown once a month) as well as disciplinary-related activities and seminars so as to involve more students in the learning of the language.
2. Implement student-centred methods of learning; act on students' suggestions to build campus culture; and strengthen the staff's understanding of and support to their students.
3. Encourage cross-disciplinary learning; and create a harmonious atmosphere for the students from different disciplines or even from different campus.
4. Provide more trees and other plants on the campus; strengthen the on-campus community activities; and also the integration of campus culture with the related environments.
5. Provision of better teaching facilities; provide more computer rooms for students' autonomous learning out of class; school management to

promote students' motivation and participation in the creation of campus culture; attract students away from computer games to the learning; and influence the students to spend more time on study and less energies on extra-curricula activities and business.

Of the total of 120 participants, 29 didn't show any interest in the last question due to their viewpoint that learning English was their personal business, while 191 expected the following measures to be taken to enhance their learning of English:

1. Create on-line English learning environments that promote listening and speaking of the language. The school web should offer a particular place for the communication in English between students and staff. Two-way communication and interaction should be stressed to encourage students to speak English.
2. Use multimedia to improve listening and speaking skills; invite more English instructors to help students practice oral English; train students to read and write under the instruction and guidance of the Chinese staff; and to form groups to practise English, especially in terms of listening and speaking skills.
3. Create English environments so that students can be exposed to English every day. The ways suggested to accomplish this include class discussions or English debate contests that involve students in the communication in English; English songs to be broadcasted on campus during class breaks; movies in the original to be played frequently; and road signs, notice, announcements, posters, etc. to be included in English. Students can be organized to view the movies or learn the songs in English regularly by the Student Union.
4. Motivate students' interest, particular, motivation and involvement in the leaning of English by applying multimedia, offering frequent tests, English games and activities, inviting English students to join in the English activities or to offer seminars on English culture, providing English broadcasting programs, frequently opening the language lab rooms for students' self-study in their spare time, and implementing on-line communication between staff and students, and among students themselves.
5. Promote on-line learning of English, via which students can practice the English skills of listening, speaking, reading and writing in their dormitory.
6. Create multi-cultural environments and transform teaching methodology so that English is learned in everyday situations; stress teaching quality; instruct and direct outside-curriculum learning; occasionally use Chinese in the English classes; provide extra places for students' self learning in the spare time; and promote development of students' practical application of English knowledge rather than teaching for succeeding in tests.

75% of the total participants were satisfied with the beautiful campus environments, learning resources available in the library, staff's teaching methods and positive attitudes towards students' learning of English, the application of multimedia in the teaching, and the learning activities provided on the campus. However, some of the students still found both business-oriented management of the school and students' web game indulgence as distractions from their study of English. As to the weaknesses of the current campus culture, students strongly suggested building campus learning atmospheres especially on-line English learning environments, strengthening communication between students and their instructors during the learning, and providing various activities to let students be exposed to English so that students' motivation in the learning would be promoted and the teaching goal to develop students' application of the English language gained.

CONCLUSION

The present study reveals the relevance of campus culture to English learning. Campus culture is closely related to learning communities in class or learning environments; English learning is considered as an important component of campus culture. To promote a multi-cultural campus atmosphere is to create the learning environments in which students can be exposed to the English language. It was found that students expected to see the notices, announcements, road signs, posters etc. in English on campus; they wish to be frequently organized to view English movies in original and learn English songs; students require opportunities to communicate with other students and staff in class or on-line environments to practise English use; they wish to sit in classes or seminars given by English staff etc.; students regarded devoting additional efforts to the learning of English Language to be important and hence the English curriculum design should involve both teaching inside the classroom and student autonomous learning outside the classroom; and there is a great need to apply multimedia in teaching and promote interaction in learning of English. Given the emerging internationalisation of higher education, the suggestion by students to seek greater on-campus presence of foreign staff that speak English as their first language, ought to be accorded an adequate priority by the University management.

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An important finding of the study is that the students assigned the highest priority and satisfaction with their likelihood of completing the Chinese University program and lowest priority to dropping out from the program. These student transition rates are very important to the institution from a number of perspectives. First, course completion constitutes a positive outcome from the University whilst minimising student attrition rates are also important to the institution, as it helps to retain students within the University. Second, often the funding of institutions is tied up with their student numbers and enrolments can only be maximised by improving the retention rate via lower drop-out rates. Third, if students drop-out from the program, the University will need to recruit others to fill the enrolment gap, thus increasing marketing and related institutional costs.

A further aspect of student completion that emanates from the study is the factors that can influence this transition rate. In particular, the multiple regression analysis reveals that having friendly students on campus and enhancing the students' security on campus will

(all other things being equal), impact positively on student completion rates at the Chinese institution. This then provides possible future strategies that can be used to improve program completion rates at the institution. Perhaps further research ought to be undertaken to test the possible hypothesis that these factors may also be important at other Universities; such research could assist in the development of generic strategies at the system-wide level in the optimisation of program completion rates.

Unfortunately the study indicates that the gap between perceived importance and satisfaction was widest with respect to whether the campus environment was conducive to learning. This suggests that the institution needs to assign the greatest priority in the future to improving the learning and teaching environment for the students. In the development of future strategies, the University ought to take cognisance of the finding that male students were less satisfied with this environment than females. Thus perhaps the strategies need to target male students and make the changes necessary to enhance their learning whilst maintaining a supportive environment for their female counterparts on campus.

The study also found that the low socio-economic status students were less satisfied with a number of campus cultural factors. Accordingly, the campus environmental changes need to target this group so that, for example, the campus conditions are more conducive to enhance their learning, probability of completing their programs and the like.

This study has considered the campus environment from the students' perspective. It is equally important that the staff viewpoints are also sought on this issue in the future. This will permit the institutional researcher to identify areas of convergence and divergence between the two groups and thus may be very helpful in formulating future learning and teaching plans for the institution.

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KNOWLEDGE CAPACITY BUILDING THROUGH QUALITY MANAGEMENT OF EDUCATION AND INSTITUTIONS OF HIGHER LEARNING

Nirwan Idrus

ABSTRACT

The globalization of knowledge or information is multidirectional. It only makes sense when the provider and recipient of the knowledge or information are capable of both providing and receiving. The fact currently is that this is not the case, especially when it involves developing countries. While the expectations are that developing countries should at least be able to receive, if not provide, the education infrastructure is normally not present to allow that to happen. This paper proposes an exploration into effective learning, a move away from current pedagogical thinking and delivery and instilling innovative management of institutions of higher learning, so that we could *catch up* with the rest of the world and hence join them in globalizing knowledge and information. In particular, this paper discusses the demise of *rote learning* in this technological and globalised world and challenges the Asian values concept of *acceptance.* In combating these educational drawbacks, this paper advocates a fundamental change in the requirements of teachers in the broadest sense of the word (i.e. including lecturers and professors). At the same time this paper also discusses the need for a conducive environment to allow the above to occur. This leads to a quality-based management of higher education institutions. This requirement has become a given in many developed countries.

INTRODUCTION

Globalization is inevitable. Like everything else, it is up to us to gain from it. Like everything else also, we must prepare ourselves for it too. This is not child's play. Preparing for globalization is a serious undertaking. The problem is that globalization started some time ago. Will we be able to catch up? The answer is very simple. We absolutely will not if we don't start doing something now.

Since this century is the knowledge century, it is also inevitable that education must figure prominently in our preparation for globalization. Here lies a formidable challenge. Differences in the philosophy of education between the members of the global village, in the current level of education, in the current educational environment, in the current educational technology, in the current educational and knowledge capacity; all contribute to the rigour of the challenge.

With globalization, sharing is fundamental. Sharing of experience, sharing of different resources, sharing of expertise and so on. However, the most appropriate sharing of course is where the partners are equal. However, we know that no two countries anywhere in the world are equal. The USA is different than the UK, France, Germany and so on, as the UK is different from India, Malaysia, Japan and Korea. Closer to home, of course Malaysia is different from Indonesia, the Philippines, Thailand, Cambodia and so on. Therefore, by nature, globalization is going to be dotted with imbalances of sorts. Nevertheless, only those with the capability of receiving what others are providing will gain. Like playing sport, we know that we will learn more from playing with somebody who is much much better than us. But will s/he play with us if we are too far below their standard?

In similar ways, countries that would like to be involved in globalization will also need to raise their standards so that they could *play* with other countries from whom they may gain something.
This paper is an attempt to make us aware of this need to prepare ourselves in terms of education development in order to allow us to become an active player in the globalization of knowledge and information. By no means is it saying that we are not at all there, but that awareness will make us more focus on the need to continually improve ourselves. Perhaps one day we will be the instigator of change and globalization of some particular knowledge and/or information.

ROTE LEARNING

Rote learning has been discussed at many fora pointing mainly to its disadvantages in our modern and technological world (Schoenfield, 1987, 1991; Reusser & Stebler, 1997; Harvey, 2002; Idrus, 2003; Pangulangan, 2005). Arguments for its efficacy have also been equally expounded (Bartolli, 1989; Dixon, 1994: Blumenfeld, 2000; Heward, 2003). What we could derive from these arguments is simply that rote-learning and non-rote-learning (for want of a better description at this stage) have got their respective places in learning. It is a matter of finding out what these places are before applying the type(s) of learning most appropriate for them. In knowledge and information development, I contend that rote-learning has a major disadvantage.

In both knowledge and information development we need to be able to think, to experiment, to seek new knowledge, to logically expound it, to disseminate it and to continually enhance it. Even superficial assessment of these requirements could only point to the misfit of rote-learning. The common definitions of *rote* range from *fix in memory by means of frequent repetition*, *use of memory usually with little intelligence*, *repetition carried out mechanically or unthinkingly* (Webster's Dictionaries, 1850, 2002) to *learning that avoids grasping the complexities…*(Wikipedia, 2005).

Recent discussions with those who are either involved in or researching in the area point to the ubiquity of rote learning in many Asian countries. In one Jakarta's leading private high school, for example, a student's answer is declared incorrect because it is not the answer given in the answer book held by the teacher (Wijaya, 2005), even though the

student's answer was more logical than the answer given in the teacher's handbook. Dictation rather than lectures at university level in several Southeast Asian countries appears common, although information transfer could now be more effectively and efficiently done through the web and electronically. The opportunity to use class times for knowledge discussion and development is then forgone.

Compare this to a case of a seven-year old pupil in a New Zealand primary school, who was given an assignment to write about volcanoes in Russia. The teacher did not even tell the pupil how to do the assignment other than indicating that pupils should refer to books, magazines and journals in the Public Library or access information on the web.

Is this not a practice of the famous Chinese saying *"Give a man a fish and he will live for a day. Teach the man how to fish and he will live a thousand years…"*? The obvious question is of course, why we in Asia are not practicing this in our education and training?

Given that the shelf-lives of many disciplines and knowledge are reducing rapidly, is it also not logical to ensure that students learn how to learn rather than learn a particular subject which may not even exist over the same period that it was learnt?

ASIAN VALUES

Going by discussions on Asian Values (Amartya Sen, 1997; Inoguchi & Newman, 1997; Suryadinata, 1997; Fukuyama, 1998; Shaw, 1999 and Koh, 1999) little wonder that *rote learning* is a natural extension of control by the elites who misappropriated the Confucian teaching as the Asian Values. And control of education through *rote learning* of course simply completes the loop.

The typical Confucian teaching that has been excerpted is that *people are born not with rights but with duties in a hierarchical setting*, vindicated even recently by the result of a survey (Koh, 1999) that only 32% of Asians interviewed appreciated *personal freedom* (against 82% of Americans) and only 29% of Asians believed in *individual rights* (against 78% of Americans).

Such teaching and such results gave rise to a phenomenon of *acceptance*, particularly by the masses which by definition form the majority. As a result the elites are firmly entrenched in their place at the peak of the hierarchy and the masses simply accept their fate at the hands of the elites. If they are fortunate, the masses somehow inherit a benevolent leader and everybody is happy ever after. If not, which is mostly the case as history would show, then the *teaching* is reinforced and passive acceptance pervades every walk of life including education.

In these cases of course, the students do not and are not allowed to engage the teachers who sit much higher in the hierarchy. This is repeated *ad infinitum* as students become teachers and their students become teachers and so on. The system is self-reinforcing as the current students aspire to be teachers as soon as possible in order to claim the benefits

of the higher level in the hierarchy. Many a time of course even before they are qualified to be teachers.

QUALITY IN HIGHER EDUCATION

Literature shows that quality in higher education is here to stay (Barnett, 1992; Green, 1994; Gordon, 1997, 2005; Idrus, 1996, 1999, 2001, 2003, 2004(a, b), 2005; Woodhouse, 2001). Quality, however defined, is in the higher education vocabulary and searches through university websites inevitably found the word quality prominently displayed in their visions, mission statements and their management plans.

Regrettably, not all involved understand quality in the same way. Academics who are naturally proud of their standing and the standards of their lectures and exam questions think of the quality process as students ability to crawl over the academic hurdles put in front of them. The tragedy of course is that it does not matter whether the students are indeed able to get over the hurdles or not, quality is claimed to be proven. On the one hand, the professors or lecturers would be proud when most of their students passed and could therefore claim the quality of their teaching that allows their students to pass the already difficult academic hurdles put in front of them. On the other hand, the professors and lecturers would also claim quality when a lot of their students are not able to pass their subjects.

The understanding of quality shown by academics above is what is known as quality control shown in Figure 1 below.

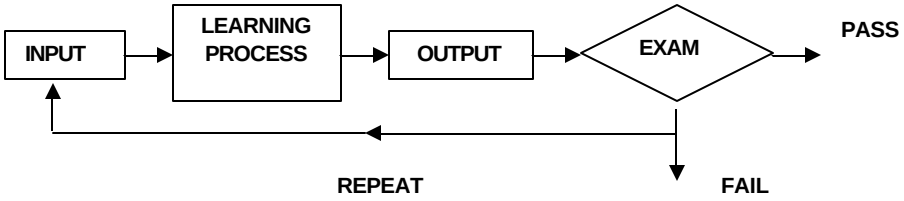

Figure 1 *Diagrammatic description of Quality Control*

Essentially, the output of the learning process is put through an assessment process or examination where the results could only be a *pass* or a *fail*. Those who passed would be considered successful while those who failed are not. Some of those who failed may be given another chance by repeating the learning process, even though this learning process had failed them in the first place.

In quality control, an inspection (or examination in the educational case) is done post the output or production. Nothing is done to the process (learning process in the educational case).

Just like *rote learning* and *Asian values* discussed earlier, *quality control* (or QC in brief) is but another manifestation of control by one over another.

While examinations still rule high in many higher education institutions everywhere in the world, the freedom of assessing students is very limited in many Asian and developing countries(Wijaya, 2005; Idrus, 2003; Hazman 2004 (a), 2004(b)).

The *trinity* of *rote learning, Asian values* and *QC* must therefore be addressed if we wish to catch up with the lost time and to allow us to participate actively in globalization.

TRANSFORMATIVE LEARNING

For *rote learning* and *Asian values* (in particular the *acceptance* phenomenon), transformative learning propounded by Harvey (2002) promises a practical solution. Harvey proposed that we should move from *rote learning* where by definition lacks depth, to *understanding* where by definition delves deeper into the matter. At the same time we should move from *acceptance* where by definition lacks critical analysis, to *reconceptualisation* where by definition requires deep critical analysis which in turn demands an ability to synthesize. Figure 2 shows this diagrammatically.

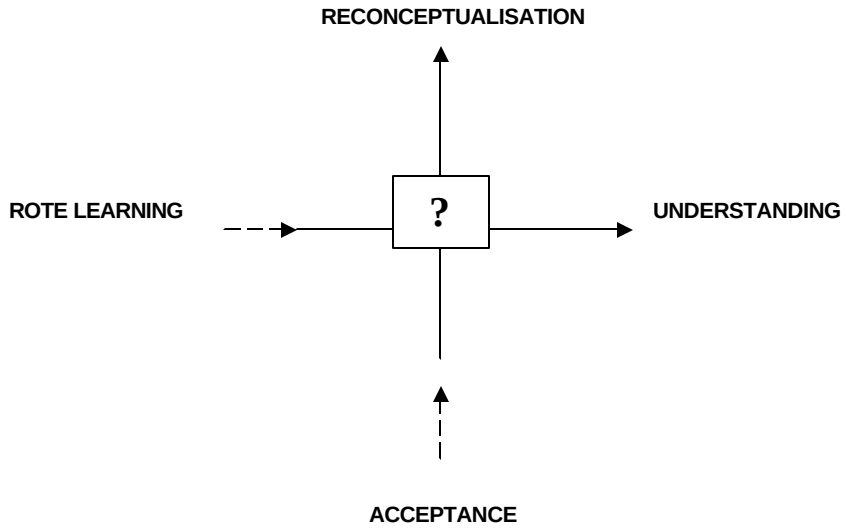

Figure 2 *Diagrammatic view of Transformative Learning*

The box with the question mark is instructive in its appearance. The question posed is obviously what should we do in moving from *rote learning* to *understanding* and simultaneously from *acceptance* to *reconceptualisation*.

The answer for both axes is simply engaging the students. This means a number of things, from respecting the students as able and thinking individuals to changing the way learning is done by both the teachers and the students. It also means that the students, as in the case of the seven-year old in the New Zealand primary school, must be empowered in the full and correct sense of the word.

Empowerment is yet another related concept that appears to be pushed to oblivion by both *rote learning* and *acceptance*. At best, empowerment is given lip service by many managers not only in Asia. The resulting abrogation of the managers' responsibilities naturally created problems.

One definition of empowerment (Kinlaw, 2002) is "*…the process of achieving continuous improvement in an organizations' performance by developing and extending the competent influence of individuals and teams over the areas and functions which affect their performance and that of the total organization…*"

Simply, empowerment is the sharing of competence and the ability to influence others in order to improve their performance. In other words the roles of the manager (in the broadest sense of the words, so at institutions of higher learning it means, Vice-Chancellors, Deans, Directors etc) have essentially changed to coaching their staff and students in our case, to impart them with new knowledge and competence, to lead them in the most appropriate way so that they become better, more capable and more competent.

Empowered learning is therefore an essential and necessary part of *transformative learning*. This therefore is the ***student engagement*** that should fill the box with the question mark in Figure 2.

The transformation, however, is still unfinished until the learning system moves from QC to something else that makes more sense.

QUALITY ASSURANCE

QC can be described as a system by which we separate the good from the bad products. We cannot do much about improving the products because they have been processed and manufactured. More importantly we do not look to improving the process in this system. Whilst elegant and sophisticated sampling methods have been devised and used to extrapolate results to all batches of the products, it nevertheless defies simple logic.

Is it not simpler if the process can be tuned to ensure that all the products at the output end meet the requirements? Firstly, we eliminate one element in the process, namely Inspection. Remembering that quality or efficiency is the product of the elemental quality or efficiency, reducing one element in the system will also definitely improve the overall quality of the system. Secondly, if we can tune the process in order to ensure perfect outputs, then we would have saved a lot of unnecessary costs which arise from manufacturing products that would be rejected. We call this system Quality Assurance or QA for short.

Taking the parallel in education, much savings will also accrue from reducing failures without reducing the quality of the process or outputs. Imagine if the average full-fee of a course is RM 30,000 per annum per student, the failure of only 5 students in a class

would therefore waste some RM 150,000. Imagine a university with 10,000 students enrolled and a policy of using the bell curve distribution in passing students (in other words a specific failure rates) of say even 90% (that is a failure of 10% or some 1,000 students). Multiply this number by RM 30,000 and we will end up with RM 30 million. In fact if universities are sincere enough to state their failure rates in their annual reports, we will find that 10% failure rate is quite conservative. What will this cost the whole country? If we assume the country has 14 state universities with an average of 10,000 students each, this will cost the country a whopping RM 420 million a year. Could we not put this to better use? We have not even included the private university-colleges that number more than the state universities. Doesn't putting this way make one think twice or thrice about our current educational system?

The caveat however, of course is that we must not increase the passing rate with reduced quality. This would defeat the purpose. One of the better ways to do so therefore is through *transformative learning* and *QA*. But how do we do that?

CONDUCIVE ENVIRONMENT

Every improvement must start with an environment that is conducive to creating that improvement. Environment is itself created by physical site as well as mental and psychological conditions. It is therefore not enough to have a new organizational structure alone. The people sitting in each of the boxes of the organizational chart must also have the predilections towards providing the mental and psychological environment essential to encourage the doers practice both *transformative learning* and *QA*.

That is, firstly, managers in a university must be committed to the changes mentioned above. This commitment must not be in words alone. The best manifestation is through action. Walk the talk is another way of saying it. It is one thing to say that staff are empowered and then slap on a log-in and log-out time and get staff to explain why they are late, why they didn't log out the day before and so on. At the other end, it is one thing to tell staff that bonuses are paid on the basis of performance and another when staff found out that those who don't perform are getting higher bonuses than those who do. It is one thing for management to say that it cares about all staff and then staff found themselves queuing up for food in a humid open air stalls while management is being served in air-conditioned tents.

Ricardo Semler (2003), proprietor of the famous Brazilian company Semco, made several interesting points when he asked:

1. Why are we able to answer emails on Sundays, but unable to go to the movies on Monday afternoons?
2. Why can't we take the kids to work if we can take work home?
3. Why do we think the opposite of work is leisure, when in fact it is idleness?

He further suggested that organizations must provide opportunities for success to staff and must do their utmost to give staff opportunities to use their talent reservoir. This is

not easy. Managers need to put a brake to showing off their wisdom and let staff have their say and get these properly considered and recognized by management.

Semco continued to dominate various businesses in Brazil and elsewhere around the world through different and sometimes hostile governments. All initiatives, ideas, new businesses and development emanate from and dealt with democratically by staff. Semler though the son of the owner and a major shareholder, has no more rights and no more votes than any other staff at Semco. Any staff member can attend any management meetings and s/he is recognized as a full member of the meetings when they attend.

Semco is indeed at one extreme of the management spectrum and not many organizations around the world operate in this manner. However, this does not mean that we cannot start thinking about it and perhaps even try to emulate some of its practices. After all, we have some way to catch up and anything that may help us in this endeavour should at least be tried.

NO MORE TEACHING, JUST COACHING AND LEARNING

Engaging students in transformative learning involves a major change in teacher-student interaction as we know it. Like Semler, teachers (in the broadest sense includes lecturers and professors) will also need to put a brake to their teaching and let students learn. Teachers should lose their superiority towards students and treat them as adults with deep talent reservoir that needs to be mined. The roles of teachers will need to change. Mining students' deep talent reservoirs must become a priority. Coaching students and letting them learn in a democratic way will engage them.

Given the chronic domination of the old system, it is only appropriate that these changes be eased in. Students will need time to adjust as will teachers. In addition university management will need to prove their support for this fundamental change.

Fukuyama (1998) concluded that there is correlation between democracy and development and that wealthier countries in fact expand political participation. There is no reason that this cannot be true with education as well.

CONCLUSION

Things have moved on a lot particularly with the advent of computers and information technology. Our management and education unfortunately are still trying to catch up with these advances.

If we wish to build our knowledge capacity which now cannot but must be global, improve our ability to participate in its globalization and be considered an equal in these interactions, we must inevitably change our educational system and practices.

Transformative Learning which moves us from *rote learning* to *understanding* and simultaneously move us from passive *acceptance* to *reconceptualisation* is suggested

here as an alternative to current learning method in most Asian countries that had stagnated knowledge development capacity.

This paper complemented the suggested change in learning methodology with the *democratization* of management style, the introduction of real and substantial empowerment of both staff and students, all of which are mandatory to create the appropriate environment for *transformative learning*.

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