STRENGTHENING HIGHER EDUCATION FOR A SUCCESSFUL WORKFORCE

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Benchmarking of Postgraduate Programmes in Education in Malaysia

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Introduction

Of late education organisations have been held accountable to address quality-related questions. Every institution of higher education is subjected to an increasing demand for quality assurance, the underlying concern being the degree to which the "totality of *the* features and characteristics of *the organisation's* product or service bear on its ability to satisfy stated or implied needs" (International Standard Organisation 1986 definition, emphasis added). This means that higher learning institutions are expected to deliver products and services at some acceptable level of utility or benefit, specifically with respect to their core business – teaching and learning. To address this pressing concern, education organisations have been assessing themselves by asking questions such as, "(1) How well are we doing compared to others, (2) how good do we want to be, (3) who is doing it the best, (4) how do they do it, (5) how can we adapt what they do in our institution, and (6) how can we be better than the best?" (Alstete, 1995: 2).

To address these quality-related questions, continuous assessment is called for. Since the mid-1990s, benchmarking has been used as an assessment concept and tool to examine how organisations perform (Camp, 1998). As an assessment tool, benchmarking can be defined as a "systematic process of searching for best practices, innovative ideas and highly effective operating procedures that lead to superior performance" (Hammer and Stranton, 1995: 11). Haserot (1993) suggests that benchmarking is a "continuous process of measuring services, products and practices against those organisations recognised as leaders, or their toughest competitors" (p. 81). It entails a systemic course of actions to determine who is the very best, who sets the standard and

what that standard is. Hence, it is a process of learning from other organisations on how and what to improve. Alstete (1995) notes that the University of Chicago, Oregon State University, Pennsylvania State University and Babson College have been conducting benchmarking to assess their performances relative to the performances of other institutions. Similar reports of the undertakings of benchmarking in a number of developed systems of higher education, particularly in Australia and the United Kingdom are found in the literature[1].

Alstete (1995) points out that benchmarking "helps overcome resistance for change, provides a structure for external evaluation and creates new networks of communication between schools where valuable information and practices can be shared" (p. 2). In so doing, the process facilitates inter-institution and intra-institution comparisons, monitoring and diagnosis (Farmer and Taylor, 1997), realistic goal-setting and improvement tracking (Alstete, 1995), dramatic innovation (Shafer and Coate, 1992) and the specification of acceptable performance level (Farmer and Taylor, 1997).

Although benchmarking has been a widely used assessment tool in quality management, the benchmarking of postgraduate education is still at its infancy. Obviously benchmarking is still uncommon in higher education (Dattakumar and Jagadeesh, 2003; Engelkemeyer, 1998). Fiekers et al. (2000) claim that "there is little [empirical research] to sensitise the people involved in carrying out benchmarking exercise to the issues that need to be faced and the means of resolving some of the main problems encountered." In particular, Marsh, Rowe and Martin (2002) point out that not much is known about the functional effectiveness of higher education, especially those that relate to postgraduate programmes. These authors specifically benchmarked students' evaluation of research supervision to compare the outcome-related performances of the programmes. The current review also managed to extract only a small number of published reports on benchmarking in higher education. Thus, there is a need for more empirically-based reports, be it strategic or outcome-related study, describing the application of benchmarking in postgraduate programmes.

In light of the preceding observations, this study was designed to benchmark the performances of postgraduate education programmes which have been offered at various local higher learning institutions against a world-class institution, which has been ranked as the best graduate school of education. In general, the study was set to benchmark

the key performance indicators (KPIs) which represent the best practices in the delivery of postgraduate programmes in education. To search for the best practices, the study examined both the strategic and outcome indicators. Specifically, the study assessed and evaluated measurable strategic performances including the direction of the postgraduate programmes and the major features of the programmes, students and faculty across five local universities. In addition, the study measured and evaluated the outcome measures of the respective programmes, in particular the graduation rate and students' evaluation of research supervision. The study tested the likelihood of using students' evaluation as an indicator of outcome performance in comparing institutions.

The literature shows that the previous reports on the benchmarking of postgraduate programmes had examined the admission process (Fiekers et al., 2000), students' evaluation of research supervision (Marsh et al., 2002), teacher education curriculum (Blackwell, 2003), faculty productivity (Middaugh, 2001) and competence-based curriculum (Carraccio, Englander, Wolfsthal, Martin and Ferentz, 2004). These few published reports contained findings of theoretical and practical importance. The study by Feikers et al. (2000) for example, reported the formulation of process-based KPIs and critical ratios that are commonly shared by postgraduate programmes. These indices are crucial for intra-and inter-institution comparisons, the results of which would lead to the creation of action plan for self-improvement. The benchmarking of postgraduate students' evaluation (Marsh et al., 2002), produced valid and reliable outcome-based constructs, which are the KPIs for postgraduate students' evaluation of research supervision. Although the KPIs are not helpful in inter-institution benchmarking, the authors assert that the indicators would substantially contribute to self-improvement in supervisory practices among thesis supervisors within particular postgraduate programmes.

To fully gain from this assessment exercise, Fiekers et al. (2000) suggest the use of *target performances*. These are the generally accepted standards of performance deemed important by stakeholders. Precisely, a target performance represents a threshold, the minimum requirement or standard for quality performance. The standards spell out specific requirements pertaining to learning outcomes, curriculum, teaching, assessment, student selection, teaching-learning methods and resources and professional development. Nyquist (2002), for example, proposes ten categories of core competencies that describe the capabilities of

successfully PhD holders. Peters (1994) suggests that the degree of compliance with these standards indicates the strategic performance of particular programmes.

Method of Assessment

Selection of Benchmarking Subjects

To assess the relative performance of the postgraduate programmes, the study examined their strategic mission and performances. First, the study selected a set of retrievable measures that represent the strategic mission of the participating institutions. Collectively the measures would describe the nature, culture, values, people and core-competencies of particular postgraduate programmes. This is "strategic benchmarking" (Peters, 1994), which would enable the study to identify the winning strategies of the best institution. Hence, the study could propose strategies which are "more likely to give sustainability and continuity of the momentum of progress and advancement" (Zairi, 1998: 44).

The assessment of strategic mission, which is associated with the "soft" aspect (Zairi, 1998) of benchmarking, included the quantifiable attributes of the competing programmes, faculties and students. The inclusion of quantitative-based measures, in the form of the number of specific programmes, student intake and faculty variables allow the researchers to extract several KPIs and critical ratios, which include the student-instructor ratio, student-supervisor ratio and faculty-programme ratio.

Second, the study assessed two outcome-related performances of the postgraduate programmes, namely the rate of graduation and students' evaluation of research supervision. The study made use of previously tested instruments that measure students' evaluation of research supervision (Marsh et al., 2002; Wilde and Schau, 1991), with several modifications. The responses of the postgraduate students from the participating institutions were analysed. In particular, the researchers examined the psychometric properties of the data in order to establish the KPIs of the outcome performance. The graduation rate was computed on the basis of the percentage of students who had successfully completed their respective programmes within the average study period in Malaysia, which were two years for a master programme and three years for a doctoral programme.

Selection of Benchmarking Partners

To date there are 11 public universities offering master and doctoral degrees in education. Five of the universities were selected based on their established postgraduate programmes in education; four of these institutions had indicated their willingness to participate in the project and were thus included in the assessment. To uphold confidentiality, the four faculties were labelled alphabetically in this report. The institution which conducted the assessment is labelled as UD. The study also identified a world-class institution (WC), which has been ranked as the best graduate school of education (US News and World Report, 2003) to serve as the quality yardstick. The official documents of the said institution were available for public access, and therefore, the information related to its programmes, faculties and students was used in the present analysis.

To assess the outcome-related performances of the four local institutions, the study examined students' evaluation of research supervision. A total of 121 postgraduate students who were undergoing the thesis-writing process were surveyed; all respondents had completed the required coursework. The majority of the respondents were female (62 per cent), Malay (53 per cent) and full-time students (63 per cent). About 40 per cent of the respondents were doctoral students; the rest were pursuing a master degree in education. The adapted evaluation questionnaire consisted of 30 Likert scale items, each of which was a statement regarding research supervision to which a respondent must indicate his or her level of agreement. Essentially, the items measure different aspects of students' perceptions toward the efficacy of thesis-writing supervision and support provided by their faculties.

Results

Strategic Performance – Mission Statement

To assess the nature and culture of the participating postgraduate programmes, the study analysed their mission statement. An explicitly expressed mission of an institution and its programmes would shed light on its essential characteristics, values and operations. First, a mission statement supposes to indicate the opportunities and needs that justify the offering of the programme. In other words, the institution should disclose its purpose, aim, objectives, reasons for being in existence

and the ultimate desired results of its postgraduate programme, to the extent that it may accentuate the learning outcomes and functional competencies of the graduates and, their career paths. Second, the statement should state what it does to address the opportunities and needs. It should spell out its core business, the degrees and the areas of specialisation it offers. Finally, a compelling mission statement of a postgraduate programme should underscore its values. These values constitute the beliefs and guiding principles shared by the members of the institution.

The present study found that the world-class (WC) institution has a compelling statement of mission. In its very first statement to welcome aspiring students, it states that, "Great opportunities exist to strengthen the field [of education] as well as to fulfil our responsibilities to the nation's children." The welcoming statement emphasises the reason for its existence, in that it "will continue to work to improve education policy and practice and educate the American public about the critical importance of education to our nation's future." Accordingly, the statement of core-competencies and expected outcomes of the programme reads, "Students selecting research concentration in Administration, Planning and Social Policy generally anticipate careers as university faculty members or as researchers and analysts in international development agencies, government departments and ministries of education, research and consulting firms and research centres." Clearly, the mission statement contains values to be shared and upheld by its students and faculty members.

The mission statements of the four Malaysian postgraduate programmes also reveal the reasons for their existence. For example, the mission of one of the postgraduate programmes states that the aim of the programme is, "to promote and disseminate knowledge using quality, innovations and world-class programmes in teaching and research to produce excellent educators and professionals." In the mission of another institution, it states that the goal of its postgraduate programme is "to train and produce Islamically oriented, professional educators." Evidently both mission statements are value-laden, signifying the beliefs and underlying principles as upheld by the faculty members of the respective programmes. In addition, the institutions also listed the programmes, degrees and areas of specialisation being offered. However, these mission statements present no information pertaining to the ultimate desired results of the postgraduate programmes. Unlike the world-class

institution, neither the career paths nor core-competencies of the graduates are made explicit and the expected outcomes of the programmes are not disclosed.

Programmes, Student and Faculty Members

In order to simplify the analysis on the characteristics of the specific programmes, faculties and students of the participating institutions, the study extracted several measurable indicators. They are the key performance indicators (KPIs) conceived to be important success factors in the delivery of a quality educational programme (Ministry of Education Malaysia, 2003). On the basis of these indicators, several critical ratios that are useful in gap analysis were derived. Table 1 summarises the KPIs and critical ratios.

Of the four local institutions, institution UB has the most postgraduate programmes (19), while UD offers the least number of programmes (10). In comparison, the world-class graduate school of education offers two postgraduate degrees, the master of education (EdM) and doctor of education (EdD), with 22 distinct areas of specialisation. Among the local institutions, institution UB admits the highest number of MEd students annually (M = 258); UA admits the most doctoral students (M = 44). The data shows that UD has the lowest averages for the MEd and PhD intakes. In contrast, the one-year master programme at the world-class institution enrols 607 students. In addition, institution UB has the biggest faculty size, compared to only 22 faculty members with PhD qualifications at institution UD. Apparently, among the local institutions, institution UB has the competitive advantage with respect to diversity in programme offering, student intake and faculty size.

However, to better understand the relative performance of the "competing programmes," an examination of critical ratios and results of gap analysis is necessary. Table 1 shows the distribution of several ratios of interest, each of which denotes one aspect of the strategic performance of the institutions. Since the performance of the world-class programme has been considered as the yardstick in the present study, the critical ratios of the four local institutions were benchmarked against those of the world-class postgraduate programme. The first index is the ratio of faculty size to the total number of postgraduate

Table 1: Key performance indicators across participating institutions

*	UA	UB	UC	UD	WC
Programme**					
MSc	-	18	-	-	-
MA/Others	1	-	-	-	-
MEd	8	-	12	9	13
PhD	1	1	1	1	-
EdD	3	-	-	-	9
Total programme	13	19	13	10	22
Student***					
Master Intake	209	258	154	48	607
Doctoral Intake	44	24	13	11	55
Faculty Member (PhD)**	29	60	31	22	171
Coursework Requirement					
MEd/EdM	40	36	34	36	32
EdD/PhD	60	-	64	24	64
Critical Ratios					
Faculty Size-Programme	2.2	3.2	2.4	2.2	7.8
Intake (MEd)-Programme	46.5	28.6	25.6	10.7	46.7
Intake (PhD)-Programme	11.0	23.5	12.5	11.8	6.1
Intake (MEd)-Faculty	14.4	8.6	9.9	4.4	3.5
Intake (PhD)-Faculty	1.5	0.4	0.4	0.5	0.3

Note: * Available at the school's website
** As of April, 2004
*** Average annual intake between 2000 and 2003

programmes; a value of 7.8 (for the world-class institution) indicates that each programme or area of specialisation is managed by an average of eight faculty members. The subsequent two indices reflect each programme's admission of students. On the average, each programme at the world-class institution admits about 47 master students and 6 doctoral students annually. The last two indices represent the master student- and doctoral student-faculty ratios.

To compare the current performance among the institutions, the study applied gap analysis on the critical ratios. The study first assumed that the critical ratios are of equal importance and second, converted the ratios into percentage points, using those of the world-class institution

as the baseline measures, with a value of 100 per cent each. Table 2 shows the relative performance of the participating institutions for the five key strategic factors. The results show that of the four local institutions, UB (40.5 per cent) performed the best on the faculty-programme ratio. UB also outperformed the other local institutions in terms of the ratio of doctoral intake to faculty size. Institution UA, on the other hand, performed the best with respect to the student-programme ratios, which were 99.6 per cent (master student-programme ratio) and 180.3 per cent (doctoral student-programme ratio), respectively. In terms of the number of master students to faculty size, UD (124.7 per cent) was the best among the local institutions.

Table 2: Current performance of Malaysian postgraduate programmes (%)

Critical Ratios	UA	UB	UC	UD	WC
Faculty Size-Programme	28.6	40.5	30.6	28.2	100
Intake (MEd)-Programme	99.6	61.3	54.9	22.8	100
Intake (PhD)-Programme	180.3	385.2	204.9	192.6	100
Intake (MEd)-Faculty	412.3	245.2	283.4	124.7	100
Intake (PhD)-Faculty	505.8	130.6	134.4	178.1	100

Figure 1 presents the visual results of the gap analysis on the five critical ratios, which were faculty-programme ratio (CR1), master student-programme ratio (CR2), doctoral student-programme ratio (CR3), master student-faculty ratio (CR4) and doctoral student-faculty ratio (CR5). In this analysis, the best of the local postgraduate programmes on each critical ratio was benchmarked against the performance of the world-class institution. Clearly, the gaps between the benchmarks (100 per cent) and the best of performances among the Malaysian postgraduate programmes ranged from as small as one per cent (CR2) to as high as 180 per cent (CR3).

Outcome Performance – Graduation Rates

On the average, a master student at Malaysian institutions of higher learning takes about two years to complete his or her programme. On

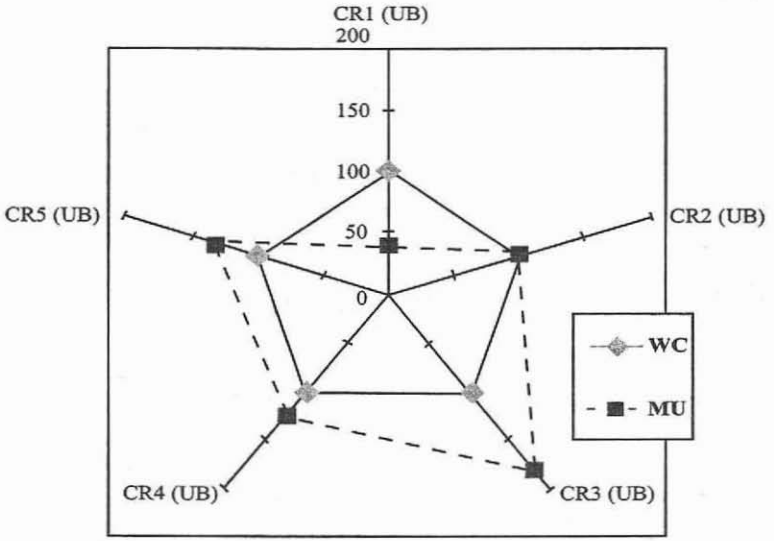

Figure 1: Gap analysis: Performance of Malaysian postgraduate programmes (MU) against the World Class (WC)

Note: CR1 (UB): the ratio of faculty size to number of programmes
CR2 (UA): the ratio of master student admission to number of programmes
CR3 (UB): the ratio of doctoral student admission to number of programmes
CR4 (UD): the ratio of master student intake to faculty size
CR5 (UB): the ratio of doctoral student intake to faculty size

the other hand, it takes at least three years for a doctoral student to graduate. These timelines were used to analyse the graduation rates of the master and doctoral students in education at the four local universities. Figure 2 summarises the results of the analysis.

The results of the descriptive analysis show that the graduation rates of the master students enrolled since the year 1998 ranged between 64 per cent (UA) and 84 per cent (UC). More than 15 per cent of the students of the master programmes did not graduate within the two-year period. The graduation rates of the doctoral students were even more discouraging. Evidently, none of the four local institutions succeeded in conferring at least 50 per cent of its doctoral students within the three-year study period. At best, only 46 per cent of the doctoral students graduated within the expected time frame at institution

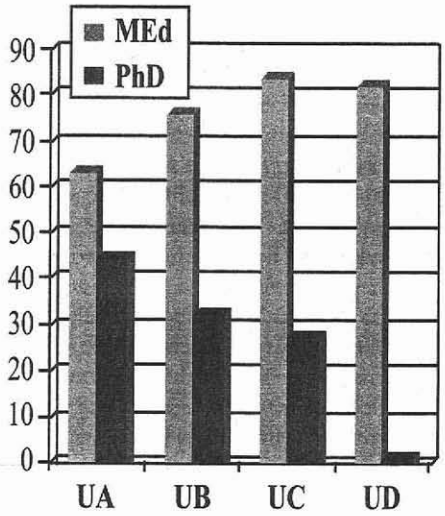

Figure 2: Rates of graduation for the students of Malaysian postgraduate programmes in education

UA, which admits the highest average of doctoral students. In this respect, the benchmarking institution UD produced the poorest performance.

Students' Evaluation of Research Supervision

The final concern of the study was to test the likelihood of using students' evaluation as an indicator of outcome performance in making inter-institution comparisons. The data collected from the 121 thesis-writing postgraduate students were first subjected to factor analysis and reliability test in order to construct – validate the indicator. Next, the relative performance of the institutions was compared using the mean scores of the sub-indicators of students' evaluation.

The results of the factor analysis show that there were four factors, the sub-indicators, underlying the students' evaluation of research supervision. The reproduced correlation matrix with a four-factor structure appeared to "best explain" the intercorrelation among variables, accounting for two-third (67 per cent) of the total variance. The variance of the

first component, the largest eigen value was 7.95, while the subsequent eigen values were 4.05, 3.35 and 2.05. To achieve a simpler solution, the data were subjected to the varimax rotation, and found that all factor loadings were large enough to be of practical value (Appendix I).

The first rotated factor had significant loadings on eleven items/ variables. These variables suggested that supervisors have been providing critical, supportive, empathic and skilful supervision to their respective students. Accordingly, this sub-indicator was labelled as *Supervisors' Efficacy*. The second rotated factor included five items, which were sharing with one common proposition – the *Development of Research Skills*. The responses to this sub-indicator collectively represented the degree to which the supervisor involved students in research-related tasks, besides the students' own research. The third factor loaded significantly on four items that represented *Intellectual Climate* of the postgraduate programme. The sub-indicator reflected the extent to which the institution supervises and supports the progress of the students' research. The fourth factor, which comprises six variables, represents students' evaluation of the *Development of Core Competencies* to enable them to assume the leadership roles in educational settings. The Cronbach's alpha coefficients showed that the sub-indicators were reliable. The internal consistency of the sub-indicators, which ranged from .87 to .94 (Appendix I), lends support to the theoretical and practical implications of the indicators. In summary, the study found that the instrument produces psychometrically sound data to assess the critical outcome indicators of a postgraduate programme in education, which in this case is the students' evaluation of research supervision.

However, the subsequent analysis yielded statistically insignificant differences among the participating institutions with regard to the students' evaluation of research supervision. Specifically, the results of multivariate analysis of variance (MANOVA) yielded statistically insignificant results, Wilks' Lambda = .860; $F(12, 302) = 1.48$, $p = .13$. In other words, the students' evaluation of the four sub-indicators of research supervision was not systematically and reliably related to the institution variable. Interestingly, these results replicated those of Marsh et al. (2002). To explain their findings, these authors emphasise that, "Because the quality of supervision at any given university is diverse, it is unlikely that there is substantially meaningful variation in the quality of supervision at the university level" (p. 333).

Conclusion and Implications

The project aimed at measuring and evaluating the performance of selected Malaysian higher learning institutions with respect to their postgraduate education programmes. First it compared the strategic missions of the competing institutions, taking into account the missions of a chosen world-class graduate school of education and using it as the benchmark. Second, it examined the relative outcome performances of the participating institutions.

In several ways, the project has clearly delineated the strategic– and outcome-related performances of the postgraduate education programmes in Malaysia. First, the participating institutions justify the reasons for their existence, for the programmes that they provide and for the values which they uphold. However, the four Malaysian institutions are yet to clarify the career paths and core-competencies of their graduates, which would categorically shape the nature of teaching and learning and their curriculum design as well as the employability of their graduates. Second, the study produced five noteworthy KPIs, the critical ratios. These are the faculty-programme, master student-programme, doctoral student-programme, master student-faculty and doctoral student-faculty ratios. Conceivably, these sub-indicators represent key success factors since they define the quality of student-faculty interactions. Benchmarked against the world-class postgraduate programme in education, there is much room for improvement for the four institutions.

Third, the study found that the graduation rates for the Malaysian postgraduate programmes, given the data, fail to meet general expectation. Specifically, more than 15 per cent of master students and 50 per cent of doctoral students did not graduate on time. Follow up discussions with several faculty members accentuated an urgent need to devise a simple, yet effective monitoring mechanism to minimise the problem. Finally, consistent with the findings from earlier researches, the present project produced psychometrically sound indicators of students' evaluation of research supervision. The project in particular, established the validity of core-competency development construct as one of the KPIs. It should be noted that the KPIs should not be used in inter-institution comparisons, although they are useful in the assessment of supervision effectiveness within individual institutions.

As expected, the findings create important implications for educational practices, particularly for the benchmarking institution, UD. The results of the study offer concrete input to its ongoing programme revision. The specific details about the gaps between the current performance of UD and those of other local institutions and the world-class institution should be given considerable attention, if the benchmarking institution is serious about its vision and missions.

Note

[1] For further information please visit http://www.chea.org/; http://www.niss.ac.uk/education/qaa; thecenter.ufl.edu/ research2002.html; http://www.asq.org/pub/qmj/past/;http://www.cidb.org.za/studentconference.html

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Appendix I

Factor loadings and reliability indices of students' evaluation of research supervision

	Factor/Sub-Indicator*			
	1	2	3	4
My supervisor is available when I need his/her help	.715	.023	-.127	-.043
My supervisor believes in his/her students' potentials	.835	.082	-.076	.191
My supervisor enjoys teaching me	.806	.013	.069	.147
My supervisor trusts my judgment	.725	.148	.031	.196
My supervisor has high expectations of his/her students	.766	.157	.011	.224
My supervisor values me as a person	.863	.078	-.059	.116
My supervisor makes a great effort to understand the difficulty I faced.	.784	.005	.062	-.116
My supervisor enjoys working with his/her students	.870	.060	-.026	.039
My supervisor is critical of his/her students' work	.448	.058	.128	.240
I was given good guidance in topic selection and refinement	.657	.173	.135	.129
I receive good guidance in my literature search	.705	.130	.178	.073
I work as RA/TA for my supervisor	.114	.098	.623	.181
We collaborate on research	.051	.126	.752	.083
We present papers together	.038	-.016	.917	.051
We co-author papers for publication	-.025	.058	.925	.043

continued

We prepare proposal for research grant together	-.027	-.078	.843	.069
The faculty/department provides opportunity for interactions with other postgraduate students	.110	.178	.055	.878
I am integrated into the faculty/ department community	.194	.195	.072	.827
The faculty/department provides opportunities for me to be involved in the broader research culture.	.140	.149	.173	.800
A good seminar programme for postgraduate students is provided	.195	.105	.133	.700

The programme enables us to	**Factor/Sub-Indicator***			
	1	**2**	**3**	**4**
Serve in other disciplines	-.054	.744	.043	.278
Serve in global economy/community	.050	.820	.045	.160
Lead and motivate an educational project, programme or an institution	.173	.883	.099	.042
Apply our expertise to address the needs of the society	.136	.861	.072	.092
Evaluate projects and programmes in the government, nonprofit, academic, and corporate sectors	.152	.904	-.031	.009
Communicate and work in team and explain work to public audiences and those who set policies	.181	.753	.007	.167
Internal Consistency (Alpha)	**.92**	**.88**	**.87**	**.91**

* Sub-Indicators: (1) Supervision Efficacy, (2) Core Competencies Development, (3) Research Skills Development, and (4) Intellectual Climate.