# Final year undergraduates' perceptions of the integration of soft skills in the formal curriculum: a survey of Malaysian public universities

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**Abstract** A recent initiative or skill bridging measure taken by the Malaysian public universities is to build into the formal curriculum soft skills to produce graduates with a right balance of diverse abilities. However, to date, there is no comprehensive attempt to review the integration of soft skills in the formal curriculum (both coursework and training) of university programmes. The paper therefore reviews the adequacy of the infusion and acquisition of the entire range of skills embedded in taught courses and practical/industrial training from the students' perspective. The specific focus of the study is to identify what worked well and what had not in acquiring the skills designated in the teaching–learning process. The key findings of the study are as follows. First, the perceived infusion–acquisition of skill types differs unequivocally between coursework and training, suggesting the complementary nature of both components of the formal curriculum for the integration of soft skills. Second, the infusion–acquisition of soft skills remains highly concentrated on specific items/skills for both coursework and training. For the coursework component, communication skills explain most of the total variance, whilst moral and professional ethics ranks first in explaining the total variance for the training component. In total, the perceived low and selective appreciation of skills by students signals the need to readdress the existing strategies within the teaching–learning process to ensure a better integration of soft skills.

**Keywords** Soft skills · Higher education · Infusion · Acquisition · Coursework · Training

## Introduction

The education market in Malaysia has witnessed immense changes over the past two decades. Of importance is that the government is no longer the sole provider of higher education, especially since the 1980s. Higher education in Malaysia is in fact becoming an export industry, especially with the opening up of foreign campuses. This results in several dimensions of competition for jobs in the domestic marketplace, particularly between graduates of public[1] and private (both local and foreign) institutions of higher learning. In 2005, the Malaysian government announced that there were 67,000 unemployed graduates, many of whom had graduated between 2000 and 2004. About 92.6% of these unemployed graduates were from public universities, as opposed to only 5.3% from private institutions. Prior to this alarming news, the Malaysian Institute of Economic Research (MIER 2004) had revealed the results of a survey on the employability and marketability of university graduates, indicating that 46.2% of public university graduates were unemployed in 2003. The reasons cited for the low unemployment prospects of public

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[1] Public universities are defined as higher educational institutions established by the government under the Universities and Universities College Act 1971 (Amended 1996).

university graduates are that they are inadequately prepared for the job market, lack linguistic (English proficiency, both oral and written) (Lim and Normizan 2004; Chiam 2005; Norizan et al. 2006; EPU 2007; Marina 2007) and technical skills, plus cognitive abilities (analytical thinking, problem-solving, reasoning).

Many other countries have also recognized that higher education has not met the expectations of employers (Leckey and McGuigan 1997; Bennett et al. 1999; Kember et al. 2006), but the issue that has received wide coverage in the Malaysian context is the marketability/employability of graduates from public universities[2] (see also Koo et al. 2009). Notably, graduates of public universities are found to lose out to graduates of private universities in terms of employment in the domestic marketplace. The key reasons for this are as follows. First, the democratization of education in Malaysia depletes national financial resources, which leads to the decline of infrastructure and resources of public institutions (Sirat and Jantan 2006; World Bank 2007). In addition to this, the rising financial costs of sustaining public universities also lead to numerous standardization procedures[3] and mechanisms to which the slow pace of response of the public universities further result in the decline of standards. One aspect of this decline that has been greatly discussed is the English proficiency of public university graduates (Lie et al. 2009). Employers in particular remain undecided about the readiness of graduates especially in oral and written communication since some public universities continue to use Malay as the language of instruction. Second, the formal curriculum of public universities lack emphasis on the integration of soft skills in the curriculum (see also Quek 2005; Quah et al. 2009). Teaching approaches have largely been didactic especially in the social sciences. As such tracer studies, commissioned research and employers have called for public universities to better build into their curriculum soft skills (language, teamwork and problem-solving), link faculty to industry and provide students with workplace experience through job attachments in the private sector (World Bank 2007).

The low marketability of university graduates, not unique to Malaysia, is generally associated with one or more of the following reasons: quality of the students who enter universities; quality and relevance of programmes offered; quality of existing academics; and result of poor research culture amongst academics (Atkin 2004, 2005). However, in the Malaysian context, the problem of graduate

employability appears to be linked to that of the quality and relevance of programmes (World Bank 2007) offered by public universities. This issue has gained wide attention recently for the following reasons. First, there is even greater realization now that students are both inputs and outputs (see also Newman et al. 2004), under the broad dimension of quality in higher education as fitness for purpose (i.e. meeting the needs of students, see Baird 2007); and second, a recognition that student learning must be enhanced beyond the mastery of content so that the graduates can succeed in the local labour market.

How then has the government and public universities responded to improve the employability of graduates and bridge the skills gap that exist? In this respect, the Malaysian government has recognized the need to also subject public universities to quality assurance[4] and established the Quality Assurance Division (QAD) within the Ministry of Education (now referred to as the Ministry of Higher Education or MOHE) in 2002. The role of QAD is to conduct academic reviews of programme performance outcomes, quality of learning opportunities and institutional capacity and management of standards. However, the QAD is found to suffer from limitations such as lack of complete autonomy and independency, lack of transparency in reporting, no international peer reviewers and no mechanism for self-review and accreditation (World Bank 2007). As such, to improve local and foreign confidence of Malaysian qualifications and the educational structure (Zita 2006), quality assurance practices in higher education were unified for both public and private universities with the implementation of the Malaysian Qualifications Framework (MQF) in 2005, under the Malaysia Qualifications Agency (MQA). The MQF comprises a code of practice on criteria and standards for higher education, which are approved nationally by the various stakeholders (both academia and industry through active consultations) and benchmarked against international best practices. These criteria are accepted and used for all qualifications awarded by recognized higher education providers. The code provides a guideline of general requirements in the following areas: vision, mission and learning outcomes; curriculum design and delivery; student selection and support services; assessment of students; academic staff; educational resources; programme monitoring and review; leadership, governance and administration; and continuous quality improvement. Further, the MQF also clarifies learning outcomes[5] of study areas, which

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[2] There are currently twenty public universities in Malaysia. Of the twenty, six universities were previously known as college universities prior to their upgrading of status to that of a university.

[3] Malaysian public universities have much less management autonomy than other Organization of Economic Development and Cooperation (OECD) countries (World Bank 2007).

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[4] Private universities were already subject to the quality regime since 1997 under the National Accreditation Board (LAN). The LAN is now legally transformed into the MQA.

[5] Learning outcomes are statements that explain what students should know, understand and can do upon the completion of a period of study, which also refers to the development of curriculum in terms of teaching and learning and the assessment of students.

is relevant to this study since one of the domains under the learning outcomes underlies categories that are beyond knowledge of discipline areas to include soft skills. Following from the MQF, public universities in Malaysia have taken the initiative to build into the formal curriculum soft skills to produce graduates with a right balance of diverse abilities. Effective 2006, soft skills are recognized explicitly in the curriculum and their achievement forms part of the assessment system in programmes offered by public universities.

This study therefore puts to the test whether the soft skills domain of the learning outcome as outlined in the MQF is realized by investigating the adequacy of the integration of soft skills in the formal curriculum programmes from the students' perspective. The motivation of the study is as follows: First, given the recency of this initiative in the Malaysian context, there is no attempt to date to comprehensively review the integration of soft skills in the formal curriculum (both coursework and training) of public universities. As such, their effectiveness remains to be determined (EPU 2007). Second, information on the adequacy and the type of skills acquired by students at the end of their undergraduate programme would be invaluable input to improving the curriculum design and delivery. The study reviews the infusion–acquisition of the soft skills in taught courses (not including stand-alone subjects) and practical/industrial training from the students' perspective. The specific focus of the study is to identify what worked well and what had not in acquiring the range of skills designated in the teaching–learning process. The remainder of the paper is structured as follows. "Literature review" reviews previous related work on soft skills at Malaysian institutions of higher learning. "Methodology" elaborates on the framework and mechanism for collecting data. "Results and discussion" presents and discusses the main findings of the study. "Concluding remarks" concludes.

## Literature review

Soft skills in new graduates are essential for employability[6] (see McLaughlin 1995). Soft skills represent 'skills which support any discipline (generic), and which can be transferred to a range of contexts, in higher education or the workplace' (see Bennett et al. 1999). Key skills often cited as desirable prime outcomes of higher education include communication, information communication technology, problem-solving, teamwork and lifelong learning. However, these skills are not just necessary to gain employment

but to realize the potentials of the graduate and ensure sustainable employment. In this respect, key skills also include personal attributes encompassing elements such as loyalty, commitment, honesty, integrity and ability to deal with pressure, motivation and adaptability. Various terminologies have been used to define key skills of employability, such as core skills, people skills, generic skills, transferable skills, foundation skills and soft skills. However, these definitions are similar in that they view employability as a set of skills, abilities and attributes that complement the field of specialization of graduates.

Several studies have been conducted to understand the reasons for graduate unemployment in the Malaysian context. Norshima's (2008) study on computer science graduates of public universities in 2006 reveals two main reasons for their low employability: the low levels of English proficiency owing to the fact that the Malay language remains the medium of instruction for most courses (see also Roselina 2009); and conservative and rigid teaching methodology that lacks the infusion of skills necessary for the job market. The study by Norshima (2008) however focused on the students' perspective (see also Quek 2005; Gurvinder and Sharan 2008) pertaining to the low employability levels of graduates. Other studies that also stress the importance of verbal communication skills for local graduates but from the employers' perspective is that of Quah and Lim (2006), Gurvinder and Sharan (2008), Quah et al. (2009) and Koo et al. (2009). In addition to problems related to communication skills amongst local graduates, the study by Quah et al. (2009) further points out that employers in Malaysia continue to favour foreign over local graduates given the latter's weaknesses in the following key areas: leadership/problem-solving skills, flexibility/adaptability, creative/innovative skills, confidence/positive self-image (see also Koo et al. 2009) and enthusiasm/motivation. Generally, most findings reveal that both students and employers share the same perceptions on the lack of critical skills required of entry-level job seekers.

How are skills then developed in higher education? When the integration of soft skills is considered in an institution of higher learning context, what is important is that a transfer of knowledge and skills from an academic setting to the workplace occurs (Gates 1997). One could develop them through coursework, internships, support programmes (academic and non-academic) and campus experiences. For this transfer to happen, several models have been put forward. It is worth mentioning two models that are relevant for Malaysia, the Affinity Group Model and the Partnership Framework, that have different approaches to the integration of soft skills in the teaching–learning process. The Affinity Group Model (Gates 1997) is designed around the cooperative learning paradigm. Five

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[6] Employability, according to Atlay (2006), has become a key curriculum driver of many institutions of higher learning.

basic elements of this cooperative model include: (1) interdependence—that every group member is crucial for success; (2) face-to-face promotive interaction—each group member supports the other; (3) individual account-ability—each group member does a fair share of work; (4) group skills—must be taught by the instructor; and (5) group processing—the group takes time to reflect about how the group is functioning. Through these elements, soft skills can be infused and competency in the transfer of knowledge from the classroom to the workplace executed. Conversely, the Partnership for 21st Century Skills (2007) put forward a model where soft skills are taught by har-nessing the latest technological tools in the teaching–learning process. The Partnership Framework stresses interdisciplinary topics focused on four themes with special relevance to modern life: Global Awareness; Financial, Economics, Business and Entrepreneurial Literacy; Civic Literacy; and Health Literacy. Interdisciplinary work often draws on a real-world context as real-life issues do not restrict themselves to knowledge from just one subject domain. The Malaysian model adapts the ideas from the Affinity Group Model on the elements for the infusion of soft skills and that from the Partnership Framework on the interdisciplinary nature of soft skills.[7] (This model is dis-cussed further in the next section).

The above discussion highlights a progression from identifying critical skills required at the workplace to developing them in higher education. Previous related work on Malaysia in particular has focused mainly on the reasons for graduate employability and the critical skills required from both the students' and employers' perspec-tives. Given that the problem of university graduates being ill-equipped with soft skills is now common knowledge, MOHE has already identified the relevant skills to be developed in higher education. This shifts the research interest to the soft skills development initiative in higher education. The transmission mode, that is the teaching–learning process of skills development, becomes a prime concern to ensure that the initiative of public universities does not remain just at a policy level. Research in this context remains at an early stage. In any case, the only study that has reviewed students' perceptions on the ade-quacy of the integration of soft skills is that of Aida et al. (2006). Their study reveals that students improved on certain generic skills in the process of university education (between junior and final year students), but the final year students still had not acquired some skills needed at the workplace. However, the study by Aida et al. (2006) does not focus on the formal curriculum as it only focuses on

skills embedded in coursework. Comparisons are also made between junior, senior and final year students, but the integration of skills in higher education is for the entire duration of the degree programme. Further, the study does not base the type of skills integrated in the coursework on the entire palette of skills as designated by the MOHE but merely concentrates on the acquisition of certain skills as it includes both public and private universities in the sample survey. This study therefore fills in the gap to identify what worked and what had not in the process of integrating soft skills in public universities in the teaching–learning pro-cess of the formal curriculum based on the Malaysian model.

## Methodology

### Framework: the Malaysian model

The study refers to the Malaysian model on developing soft skills in higher education (Fig. 1). This approach is based on the combination of (1) formal teaching and learning activities; (2) support programmes; and (3) students' campus life. Overall, the development of soft skills amongst the students via the formal teaching–learning process can be categorized into two models: (1) stand-alone (or sometimes referred to as bolt-on courses) and (2) embedded. In the 'stand-alone model', students are pro-vided opportunities to learn soft skills in the specific courses that they take on campus. These courses can be such as 'Business English,' 'Public Speaking,' 'Critical Thinking' and 'Sociology.' The *'Embedded Model'* embeds soft skills in teaching–learning activities across the curriculum. Teaching and learning is planned, and the curriculum redesigned to integrate soft skills in each course (whether in- or out-of-class) offered by the university within the context of the various programmes. Soft skills are also integrated in work placements for some pro-grammes that require students to spend a period of time in practice at the industry, commerce or public service.

The study focuses specifically on the development of soft skills in the *teaching–learning process* of the Embedded Model given prior evidence that skills are best transferred through skills integrated in interdisciplinary courses than in stand-alone subjects (which are also non-core courses) for university students (Bennett et al. 1999; Tsui 1999; Kember et al. 2006). The focus on the Embedded Model is interesting as it requires changes to traditional teaching and learning methods. Teaching styles need to become more student-centred where students are required to participate actively in the learning process (via problem-based learning, case study, presentations and group work) whilst the instructor undertakes the role of a

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[7] Salih (2007) calls the Malaysian approach of developing soft skills in higher education a holistic approach as it combines two different modalities of integration.
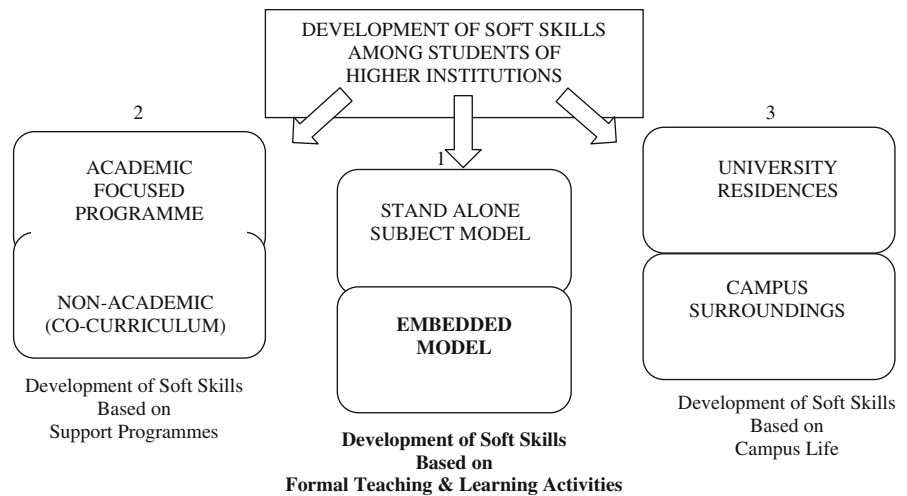
facilitator (Roselina 2009). Students' perceptions of the infusion and acquisition of soft skills for the study are thus examined in the course and practical/training components separately.

In the Malaysian context, the soft skills specifically designated by the MOHE, to be included in all degree programmes, comprise seven skills (see also Roselina 2009) as follows:

- Communication Skills in English (CS);
- Critical Thinking and Problem-Solving Skills (CTPS);
- Team-Working Skills (TS);
- Lifelong Learning and Information Management Skills (LLIMS);
- Entrepreneurial Skills (ES);
- Moral and Professional Ethics (MPES); and
- Leadership Skills (LS).

The competencies under each skill as designated by the MOHE to serve as a guideline for public universities in the teaching–learning process are as listed in Appendix Table 6. These skills are embedded in the various subjects for the entire degree programme, with some subjects incorporating more elements of soft skills than others. The aim is that students are expected to develop soft skills throughout the duration of their course and should be equipped with all seven skills upon completion of their degree programme. The study adopts these seven skills and the expected competencies of each skill in the questionnaire design.

Questionnaire design and instrument development

The questionnaire is designed to gather information on students' perspectives on the adequate infusion and acquisition of the designated 'soft skills' in the teaching–learning process. The scales of interest are the seven

categories of skills designated in the Malaysian model. For each scale (or skill category), there are at least 3 items to ensure the reliability of the responses. More importantly, the distilling of groups of questions for each skill category allows for students to reflect on their own experiences. There are a total of 28 and 34 scale items for the coursework and training components, respectively (see Appendix Tables 7 and 8).

The items in Appendix Tables 7 and 8 cover basically three elements of the teaching–learning process in the coursework and training components, respectively. The elements of teaching–learning include course type/structure/content, methods of delivery/teaching approach/instructional techniques and assessment methods. The items under each skill are decided based on the literature (largely drawn from Tsui, 1999; Dunne and Rawlins 2000; Stefani et al. 2000; Smith and Bath 2006; Dunbar et al. 2006; Billing 2007; Smith et al. 2007; Kember 2008) and drawn from the competencies under each skill as detailed in Appendix Table 6 to ensure that it covers possible strategies and approaches (though not exhaustive) for the integration of skills to ensure content validity. It should however be borne in mind that there is still uncertainty about how soft skills should be developed (see Smith and Bath 2006; Kember 2008).

The following describes the various items constructed for obtaining students' appraisal on skills' integration in coursework (see Appendix Table 7). Communication skills in English cover practice via discussions, presentations (CS1, CS2, CS3) and through listening (CS4). Critical thinking and problem-solving skills, developed best in interdisciplinary courses (Tsui 1999), include critical enquiry and learner reflection (CTPS1, CTPS2, CTPS3) to solicit quality responses and allow students to form their own positions; utilization of feedback via teacher–student and student–student interactions (CTPS4, CTPS5); instructors

competency coupled with effectiveness to give real-life examples and provide contextual applications to different disciplines (CTPS6, CTPS7); and compatibility of assessment with learning (CTPS8). Team-working skills are also driven by practice as that of communication skills and thus include the productive formation of students that fosters internal cooperation (TS1, TS2) for group work (TS3). Lifelong learning and information technology skills comprise active learning and researching (LLIMS3) with computer-aided learning (LLIMS1) and instructors' competency (LLIMS2). Entrepreneurial skills cover project formulation (ES1), knowledge dissemination on abstract theoretical principles (ES2) and networking opportunities with industry players (ES3). Moral and professional ethics basically cover observable teaching behaviours (MPES1, MPES2, MPES3, MPES4). Leadership skills include engaging in group projects out-of-class (LS2), in addition to in-class opportunities for lead-taking (LS1) and knowledge dissemination on abstract theoretical principles (LS3).

Similar to coursework, the items for training in Appendix Table 8 are identified from the literature and the skill competencies outlined by the MOHE. Communication skills in English again cover direct and indirect practice at the workplace, both written and verbal (CS1, CS2, CS3, CS4, CS5, CS6). Critical thinking and problem-solving skills comprise tasks that are problem-centred (CTPS1) and application based (CTPS2) to apply tacit knowledge and reinforce classroom learning; use of formative feedback from organization supervisor (CTPS3); and passive as well as active participation in professional discourse (CTPS4). Team-working skills include the direct and indirect engagement as a team player (TS1, TS2, TS3) and acquisition of specific teamwork skills involving coordination and management (TS4). Lifelong learning and information management skills cover the use and application of computer knowledge (LLIMS1, LLIMS2, LLIMS3), research-based tasks (LLIMS5), specific skill acquisition on information management (LLIMS4) and transforming experiential/tacit knowledge from workplace into abstract forms (LLIMS6). Entrepreneurial skills involve direct and indirect participation in projects (ES1, ES2) and acquisition of specific knowledge on project development, maintenance and promotion (ES3) that enables identification/reflection of new business ventures (ES4). Moral and professional ethics comprise exposure and training in good work ethics (MPES1, MPES2, MPES3, MPES4) and observable supervisory behaviour (MPES5). Leadership skills cover tasks that cultivate leadership qualities via independent (LS1) and problem-based (LS2) tasks, pursuing active engager role (LS3, LS5) and exposure to training under stress (LS4).

The questionnaire is thus divided into four parts: Part A compiles the general information of the respondent; Part B gathers information on the integration of skills in taught courses; Part C gathers information on the integration of skills in practical/industrial training; and Part D gathers overall information on the acquisition of the array of skills and adequacy of their training. The main analysis centres on the information gathered from Parts B and C. Items in these sections require ranking, based on a 5-point Likert scale of 0 (not relevant), 1 (strongly disagree), 2 (disagree), 3 (agree) to 4 (strongly agree).

### Pilot test

Prior to the distribution of the actual questionnaire, the questionnaire was pilot-tested on twenty final year undergraduate students of the Education, Economics and Business programmes. The pilot test was to ensure that the questions were clear and easily understood by the respondents. In general, it was observed that the selected respondents had no major difficulties in filling out the questionnaire. However, a few minor changes were made to the questionnaire to improve its format and facilitate analysis. The time taken to complete the questionnaire ranged from 15 to 20 min. To avoid any form of bias, the twenty respondents involved in the pilot survey were excluded from the final survey.

### Sampling procedure

A survey method was employed for the study, and structured questionnaires were distributed to students of public universities to obtain their feedback on the integration of soft skills in coursework and training. Students' perceptions are important as they are regarded as 'accurate credible reporters of their activities and how much they have benefited from higher education experience' (Smith and Bath 2006). The survey was carried out during the period July 2007—March 2008.[8] The target respondents were final year undergraduate students of Arts-based programmes in eight established public universities[9] (UM, UKM, UPM, USM, UUM, UiTM, UNIMAS and UMS; see also Appendix Table 8) of

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[8] The duration of the survey is lengthy given that the public universities chosen for the study are located in different states of the Peninsular and East Malaysia. The questionnaires were personally distributed by the researchers only for the universities located within the Klang Valley. However, for the public universities located in different states of Malaysia, the questionnaires were mailed to specified lecturers of the Education, Economics and Business Faculties/Schools. The identified lecturers monitored and distributed the questionnaires during their lectures to final year students. Upon return of those questionnaires, each lecturer was given an honorarium.

[9] The eight universities chosen for the study represent 76% of total enrolment in first degree Arts-based programmes in Malaysian public universities in 2008.

Malaysia. The targeted sample size was 3,200, but the achieved sample size was 1,803, giving a return rate of 56%. Of the 1,803 respondents, only 752 (42%) had undergone practical training.

The established universities in Malaysia represent a more appropriate choice for examining the adequacy of the integration of soft skills in the curriculum as they have largely been engaged in conventional methods of teaching and learning. As such, the integration of soft skills in the curriculum of these institutions has been a more recent initiative relative to the newer public universities.[10] Further, graduates from the eight public universities chosen for the study also record high unemployment levels. In 2006, approximately 41% of the jobless graduates registered with the Ministry of Human Resources Malaysia were from the eight universities, and 28% were graduates from the Economics and Business disciplines (Norshima 2008; see also Gurvinder and Sharan 2008). This also justifies the selection of respondents from the Arts and Social Sciences (specifically comprising degree programmes/specialization in Economics, Business Administration, Accountancy and Education). The enrolment and output levels of graduates from these degree programmes of public universities are also relatively high. Moreover, the enrolment and output of these courses superseded that for the other courses as most established public universities in Malaysia offer courses related to Economics, Business, Arts and Humanities. Further, in the field of Arts, courses related to Economics, Management and Education are preferred by most students. The inclusion of respondents from the Education discipline will also reduce any bias associated with the lack of teaching skills of Faculty staff since lecturers from this discipline are continuously exposed to new teaching and learning techniques relative to other faculties (Roselina 2009).

The respondents were also confined to final year students for the following reasons: (a) Having gone through at least 2–3 years of university education,[11] final year students would be able to comment and provide more valuable feedback on the integration of 'soft skills' into the various courses of the programme; and (b) They would also have most likely undergone practical training (if any[12]) and be able to provide views on the integration of 'soft skills' in the degree programme.

As the sample comprises elements of homogeneity in that respondents have either undergone coursework and/or practical training, this study employs convenience sampling. Also, as the behaviour of the sample does not differ much from that for random sampling, convenience sampling is employed. The objective of investigating the adequacy of the infusion and acquisition of soft skills can also best be answered by using convenience sampling. The absence of a proper sampling frame[13] is also another limitation that made convenience sampling the choice of the study.

## Results and discussion

### Profile of respondents

Appendix Table 10 profiles the respondents for the study. Of the 1803 respondents from the eight public universities, approximately 66% are from the Education programme, whilst the remaining 34% are from the Economics and Business programmes. The respondents are mainly Malaysians, and women constitute approximately 77% of the total sample. This is not surprising as women comprise a larger proportion of undergraduate students in the Malaysian public universities. Similarly, the proportion of Malays, Chinese and Indian undergraduates in the sample also reflects that of the race composition of public universities.

In general, the above profile of respondents indicates a representative sample of public universities in Malaysia. Further, it is also representative of the student population in public universities in terms of nationality, gender and race.

### Skills embedded in coursework and training

As explained in the methodology, the respondents were required to indicate their levels of agreement or disagreement with statements regarding the items mentioned for

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[10] The universities upgraded from the status of university colleges as shown in Appendix Table 9 are excluded from the survey as they concentrate on a narrower range of disciplines; they offer mostly technical programmes whereby soft skills has been part of their formal curriculum way before the established universities introduced them into their curriculum.

[11] Some degree programmes in the Malaysian public universities are 3 years, whilst some others are 4-year programmes. However, most of the respondents of the study are third year students since they are from the 3-year degree programmes.

[12] Not all degree programmes subject students to undertake industrial training, which is a short-term attachment (normally 3 months) to private institutions (industry, non-governmental organizations) or

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Footnote 12 continued

government and semi-government agencies during the semester break of the university. Some programmes do not have the element of industrial training incorporated into their formal curriculum, whilst some other programmes provide graduation exercise as an alternative to industrial training.

[13] The academic programme structure differs across public universities. Some universities house the Education, Economics and Business programmes as Schools under the Faculty of Arts and Social Sciences or Arts and Humanities, whilst some universities identify them as separate Faculties. Further within the programmes, there are students who major in those disciplines. In this respect, it was difficult to employ a stratified sampling method.

each soft skill. Tables 1 and 2 present the summary of means for the various items related to skill embedment in coursework and training, respectively.

From Table 1, it is evident that most items have a mean score ranging between 2 and 3, implying that students somewhat do not agree that there is adequate skills integrated in the coursework. Items that scored a mean of 3 and above are confined to the following: instructors ensured strict adherence to datelines and submission of assignments, opportunities for in-class presentation/microteaching, learning process of most courses involved active

reading, reasonable size of teams/groups, instructors monitored class attendance regularly and courses provided vast opportunities to lead in discussions/presentations.

Similarly, the integration of skills in training is also found to be inadequate based on the mean scores reported in Table 2. Most items have mean scores below 3, indicating that respondents at large disagreed on the adequacy of skills embedded in training programmes. Items listed under the moral and professional ethics skills in particular have mean scores above 3, indicating that, on average, most respondents agree that this skill has been well imparted and

**Table 1** Summary of means for coursework

| Items | Mean | SD |
|---|---|---|
| I. Communication skills (English) | | |
| Wide usage of English in lectures/tutorials | 2.96 | 0.81 |
| Sufficient interactive sessions in lectures/tutorials | 2.84 | 0.65 |
| Opportunities for in-class presentation/microteaching | 3.09 | 0.67 |
| Instructors competent in English | 2.99 | 0.77 |
| II. Critical thinking and problem-solving skills | | |
| Instructors provided/recommended critical course-related readings | 2.92 | 0.62 |
| Given problem-based tasks that included critical enquiry | 2.90 | 0.66 |
| Given reflective (thought-provoking) writing assignments | 2.90 | 0.69 |
| Received critical feedback on assignments and presentations from instructors | 2.77 | 0.74 |
| Received critical feedback on presentations from my peers | 2.67 | 0.78 |
| Instructors integrated theory with practice and real-world experiences in teaching | 2.95 | 0.70 |
| Instructors integrated economic issues with different areas of knowledge/discipline in teaching | 2.73 | 0.84 |
| Application-based questions in mid-term and semester exams | 2.89 | 0.69 |
| III. Team-working skills | | |
| Reasonable size of teams/groups | 3.06 | 0.61 |
| Good distribution of work within teams | 2.91 | 0.71 |
| Effective (brain-storming session/critical questioning) group work within teams | 2.90 | 0.70 |
| IV. Lifelong learning and information management skills | | |
| Given adequate exposure to computer skills | 2.83 | 0.78 |
| Instructors conveyed ideas and knowledge on contemporary issues | 2.95 | 0.63 |
| Learning process of most courses involved active reading/self-regulated reading | 3.07 | 0.71 |
| V. Entrepreneurial skills | | |
| Some courses included formulation of business projects/teaching plans | 2.82 | 0.80 |
| Some courses provided knowledge of basic entrepreneurial skills | 2.72 | 0.89 |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 2.61 | 0.92 |
| VI. Moral and professional ethics | | |
| Instructors monitored class attendance regularly | 3.04 | 0.70 |
| Instructors monitored and ensured adequate class participation | 2.97 | 0.65 |
| Instructors ensured strict adherence to datelines and submission of assignments | 3.14 | 0.65 |
| Instructors themselves were exemplary of their profession | 2.98 | 0.70 |
| VII. Leadership skills | | |
| Courses provided vast opportunities to lead in discussions/presentations | 3.00 | 0.62 |
| Some courses provided leadership via fieldwork | 2.92 | 0.71 |
| Some courses provided knowledge of basic leadership theories | 2.94 | 0.72 |

The ranking is based on a 5-point Likert scale of 0 (not relevant), 1 (strongly disagree), 2 (disagree), 3 (agree) to 4 (strongly agree)

**Table 2** Summary of means for training

| Items | Mean | SD |
|---|---|---|
| I. Communication skills (English) | | |
| Communication at workplace mainly in English | 2.20 | 0.88 |
| Wrote reports at work mainly in English | 2.65 | 1.08 |
| Opportunities for making oral presentations/teaching in schools | 2.93 | 0.85 |
| Opportunities to deal with customers/clients/students | 2.91 | 0.89 |
| Opportunities to observe presentations made by management/head teachers | 2.77 | 0.88 |
| Expressed thoughts in meetings/discussions at the organization | 2.36 | 0.94 |
| II. Critical thinking and problem-solving skills | | |
| Tasks given were problem-centred | 2.76 | 0.74 |
| Training provided opportunities to relate theory with practice | 3.07 | 0.71 |
| Given critical feedback on tasks by the organization supervisor/school leader | 2.95 | 0.76 |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 2.83 | 0.78 |
| III. Team-working skills | | |
| Opportunities to be directly involved in teamwork | 3.03 | 0.73 |
| Opportunities to be an observant in team discussions | 2.90 | 0.76 |
| Able to interact freely to achieve given tasks | 2.94 | 0.73 |
| Acquired skills on work coordination and work management within teams | 2.95 | 0.72 |
| IV. Lifelong learning and information management skills | | |
| Work involved regular use of computers | 2.95 | 0.84 |
| Directly involved in data input/analysis/management of databases | 2.61 | 0.94 |
| Able to use computer skills at the organization | 2.96 | 0.80 |
| Acquired new skills on information management at the organization | 2.87 | 0.83 |
| Tasks required active seeking of information through research to enhance work output | 2.86 | 0.81 |
| Able to identify/apply new knowledge acquired through training to current study | 3.03 | 0.71 |
| V. Entrepreneurial skills | | |
| Directly involved in specific projects | 2.44 | 1.06 |
| Participated in project discussions | 2.48 | 1.06 |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 2.30 | 1.07 |
| Able to identify new business opportunities | 2.19 | 1.09 |
| VI. Moral and professional ethics | | |
| Punctuality to work was strictly monitored by the organization supervisor/school leadership | 3.10 | 0.79 |
| Tasks were monitored closely by my organization supervisor/school leader through regular exchange and logbook assessments | 2.98 | 0.78 |
| Good guidance from organization supervisor/peers/school leadership on general ethical practices at work | 3.05 | 0.76 |
| Exposed to other aspects of good work ethics at the organization (honesty, integrity) | 3.08 | 0.72 |
| Organization supervisor/school leader upheld good professional ethics to be followed by the staff | 3.09 | 0.73 |
| VII. Leadership skills | | |
| Opportunities to manage tasks independently | 2.96 | 0.75 |
| Opportunities to be involved in decision-making/finding solutions | 2.88 | 0.79 |
| Participated actively in the organization of events/meetings | 2.74 | 0.88 |
| Had to meet job demands under stressful conditions | 2.72 | 0.86 |
| Provided input for the improvisation of work systems at the organization | 2.65 | 0.88 |

The ranking is based on a 5-point Likert scale of 0 (not relevant), 1 (strongly disagree), 2 (disagree), 3 (agree) to 4 (strongly agree)

acquired via training. The small standard deviations for all items again reveal small variation in responses.

The summary of means indicate that, in general, skills embedded in both coursework and training has not met the needs of the students, with the exception for a few skills. This is a first-level indication that the integration of skills in the formal curriculum has not been completely realized.

## Infusion and acquisition of skills: what worked and what had not?

The Kolmogorov–Smirnov test is performed to validate the assumption of normality in the data. As the test proves the absence of normality in the dataset, the non-parametric test is a preferred choice. Exploratory factor analysis is conducted to remove items that have low factor loadings. With new factor loadings, a Cronbach's alpha of at least 0.60 is fulfilled by all factors as suggested by Hair et al. (1998). Subsequently, to assess the factorability of the data, the Bartlett's test of sphericity (Bartlett 1954) and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (Kaiser 1970, 1974) are employed. The factor analysis is considered appropriate given that the Bartlett's test of sphericity is significant at 1% for both datasets (coursework and training). Further, the KMO indices range from 0.85 to 0.93 for all datasets, surpassing the minimum of 0.6, indicate that the sampling is adequate and acceptable.

Tables 3 and 4 report the factor loadings for perceived infusion–acquisition of skills via coursework and training, respectively. The principal components analysis with varimax rotation is used for the extraction of the factor dimensions from the underlying dimensions of 28 items and 34 items for the coursework and training datasets, respectively. Items were removed if factor loadings were less than 0.4 (see Hair et al. 1998). The scale for reliabilities is determined by the non-standardized Cronbach's (1951) alpha that is widely used (Aron and Aron 1994) and preferred (Morgan and Griego 1998). Values of between 0.5 and 0.9 for the seven factors for both datasets are considered sufficient (Nunnally 1978) for exploratory research since they exceed the 0.5 threshold. Of the dimensions shown in Tables 3 and 4 for both coursework and training components, respectively, six scales had Cronbach's Alpha values above 0.7 with only 1 below 0.7.

The naming of the factor loading matrix in this study is relatively straightforward since the items clustered reflect closely the seven soft skills. The seven-factor dimensions are thus communication skills, critical thinking and problem-solving skills, team-working skills, lifelong learning and information management skills, entrepreneurship skills, moral and professional ethics and leadership skills. Tables 3 and 4 show that all seven factors explain 59% and 64%[14] of the total variance of the infusion–acquisition of skills by coursework and training, respectively.

For the coursework component, communication skills, which include mainly the verbal usage of English in lectures/tutorials and the language competency of instructors,

explain 29% of total variance. This is not surprising given the recent shift in medium of instruction from Malay to the English language in line with the internationalization of public universities. However, this should not be taken as an indication that communication skills have been successfully integrated in the coursework component as most Malaysian lecturers in public universities are still seen to be inadequate in language and critical literacy (Zuraidah et al. 2008) and not all courses are conducted using English as a medium of instruction. The second most important factor that explains 8% of the total variance is critical thinking and problem-solving skills. The top two items clustered in the second factor relate mainly to critical feedback on assignments from both instructors and peers. The remaining five factors each explain only a small or modest proportion of the total variance. To support the factor analysis in Table 3, the results from the ranking of adequacy of skills considered most integrated by students are reported in Table 5. The highest percentages of ranking '1' (most adequate) for communication skills, followed by critical thinking and problem-solving skills in coursework support the results of the factor analysis in Table 3.

Interestingly though, the importance of the various factors is unequivocally different when training is considered (see Table 4). Moral and professional ethics ranks first, explaining 33% of the total variance. This is followed by entrepreneurship skills and lifelong learning and management skills that explain 8% and 7% of the total variance, respectively. Communication skills, which rank first in terms of its importance in the teaching–learning process of coursework, ranks last in that of training. Conversely, lifelong learning and information management, which ranks last in the infusion–acquisition process via coursework, ranks third in that of training. This is not surprising since the study by Koo et al. (2009) indicates that employers are willing to assist students better able to manage information. As such, many students do acquire information management skills in the course of their practical training.

The findings suggest that the infusion–acquisition of skills via coursework and training are not only highly concentrated[15] on specific skills but that they also complement each other once the type of skill is considered. As such, practical training is an equally important component

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[14] The seven-factor dimension for skill infusion-acquisition *via* training exceeds marginally the 60% of the explained variance recommended in social sciences (Hair et al. 1998).

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[15] The Catell's scree test (Cattell 1966) performed also confirms that only two factors contribute the most to the explanation of the variance in both the coursework and training datasets. They are communication skills (wide usage of English in lectures and tutorials) and critical thinking and problem-solving skills (critical feedback on assignments and presentations) for coursework and moral and professional ethics skills (exposure to good work ethics) and entrepreneurship skills (acquisition of specific industrial knowledge) for training.

**Table 3** Factor analysis of perceptions on skill embedment in coursework

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Communication skills | | 8.036 | 28.701 | 28.701 | 0.738 |
| Wide usage of English in lectures/tutorials | 0.802 | | | | |
| Instructors competent in English | 0.730 | | | | |
| Opportunities for in-class presentation/microteaching | 0.618 | | | | |
| Sufficient interactive sessions in lectures/tutorials | 0.587 | | | | |
| Critical thinking and problem-solving skills | | 2.225 | 7.945 | 36.646 | 0.796 |
| Received critical feedback on assignments and presentations from instructors | 0.750 | | | | |
| Received critical feedback on presentations from my peers | 0.725 | | | | |
| Given reflective (thought-provoking) writing assignments | 0.568 | | | | |
| Given problem-based tasks that included critical enquiry | 0.532 | | | | |
| Instructors provided/recommended critical course-related readings | 0.454 | | | | |
| Instructors integrated theory with practice and real-world experiences in teaching | 0.452 | | | | |
| Moral and professional ethics | | 1.538 | 5.491 | 42.138 | 0.767 |
| Instructors monitored and ensured adequate class participation | 0.744 | | | | |
| Instructors monitored class attendance regularly | 0.737 | | | | |
| Instructors ensured strict adherence to datelines and submission of assignments | 0.684 | | | | |
| Instructors themselves were exemplary of their profession | 0.633 | | | | |
| Entrepreneurial skills | | 1.334 | 4.765 | 46.903 | 0.720 |
| Some courses provided knowledge of basic entrepreneurial skills | 0.815 | | | | |
| Some courses included formulation of business projects/teaching plans | 0.683 | | | | |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 0.654 | | | | |
| Instructors integrated economic issues with different areas of knowledge/discipline in teaching | 0.638 | | | | |
| Team-working skills | | 1.192 | 4.259 | 51.162 | 0.756 |
| Good distribution of work within teams | 0.810 | | | | |
| Effective (brain-storming session/critical questioning) group work within teams | 0.765 | | | | |
| Reasonable size of teams/groups | 0.664 | | | | |
| Leadership skills | | 1.145 | 4.089 | 55.251 | 0.773 |
| Some courses provided leadership via fieldwork | 0.796 | | | | |
| Some courses provided knowledge of basic leadership theories | 0.771 | | | | |
| Courses provided vast opportunities to lead in discussions/presentations | 0.594 | | | | |
| Lifelong learning and information management skills | | 1.055 | 3.768 | 59.019 | 0.697 |
| Given adequate exposure to computer skills | 0.703 | | | | |
| Learning process of most courses involved active reading/self-regulated learning | 0.626 | | | | |
| Instructors conveyed ideas and knowledge on contemporary issues | 0.620 | | | | |

Principal components factor analysis with varimax rotation. KMO Measure of sampling adequacy = 0.916; Bartlett test of sphericity = 17131.060; $p < 0.000$

of degree programmes to ensure that students are well equipped with the designated skills.

By coursework, the lack of infusion and acquisition of lifelong learning and information management skills deserve attention. This reveals a lack of dynamism in the existing programmes of public universities. Courses should be structured to cultivate lifelong learning through active reading and research beyond textbook learning, whilst

**Table 4** Factor analysis of perceptions on skill embedment via training

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Moral and professional ethics | | 11.219 | 32.996 | 32.996 | 0.910 |
| Exposed to other aspects of good work ethics at the organization | 0.829 | | | | |
| Good guidance from organization supervisor/peers/school leadership on general ethical practices at work | 0.788 | | | | |
| Organization supervisor/school leader upheld good professional ethics to be followed by the staff | 0.784 | | | | |
| Punctuality to work was strictly monitored by organization supervisor/school leadership | 0.777 | | | | |
| Tasks were monitored closely by my organization supervisor/school leader through regular exchange | 0.748 | | | | |
| Entrepreneurial skills | | 2.845 | 8.368 | 41.364 | 0.882 |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 0.845 | | | | |
| Participated in project discussions | 0.818 | | | | |
| Able to identify new business opportunities | 0.799 | | | | |
| Directly involved in specific projects | 0.775 | | | | |
| Expressed thoughts in meetings/discussions at the organization | 0.499 | | | | |
| Lifelong learning and information management skills | | 2.217 | 6.520 | 47.884 | 0.840 |
| Able to use computer skills at the organization | 0.757 | | | | |
| Work involved regular use of computers | 0.743 | | | | |
| Directly involved in data input/analysis/management of databases | 0.726 | | | | |
| Acquired new skills on information management at the organization | 0.709 | | | | |
| Able to identify/apply the new knowledge acquired through training to current study | 0.527 | | | | |
| Tasks required active seeking of information through research to enhance work output | 0.500 | | | | |
| Team-working skills | | 1.766 | 5.195 | 53.079 | 0.870 |
| Opportunities to be an observant in team discussions | 0.809 | | | | |
| Acquired skills on work coordination and work management within teams | 0.759 | | | | |
| Able to interact freely to achieve given tasks | 0.724 | | | | |
| Opportunities to be directly involved in teamwork | 0.715 | | | | |
| Leadership skills | | 1.465 | 4.310 | 57.389 | 0.857 |
| Opportunities to be involved in decision-making/finding solutions | 0.715 | | | | |
| Had to meet job demands under stressful conditions | 0.692 | | | | |
| Provided input for the improvisation of work systems at the organization | 0.659 | | | | |
| Participated actively in the organization of events/meetings | 0.658 | | | | |
| Opportunities to manage tasks independently | 0.619 | | | | |
| Critical thinking and problem-solving skills | | 1.186 | 3.488 | 60.877 | 0.747 |
| Opportunities to deal with customers/clients/students | 0.620 | | | | |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 0.614 | | | | |
| Opportunities to observe presentations made by management/head teachers | 0.562 | | | | |
| Training provided opportunities to relate theory with practice | 0.546 | | | | |
| Given critical feedback on tasks by the organization supervisor/school leader | 0.534 | | | | |
| Tasks given were problem-centred | 0.457 | | | | |
| Communication skills | | 1.168 | 3.434 | 64.312 | 0.582 |
| Wrote reports at work mainly in English | 0.733 | | | | |
| Communication at workplace mainly in English | 0.682 | | | | |
| Opportunities for making oral presentations/teaching in schools | 0.519 | | | | |

*Notes*: Principal components factor analysis with varimax rotation. KMO Measure of sampling adequacy = 0.928; Bartlett test of sphericity = 14031.971; $p < 0.000$

**Table 5** Adequacy of skills' integration in coursework

Based on students' ranking in descending order, 1 as most adequate until 7 as least adequate

[a] Percentage of students who ranked '1' for each of the 7 skills

| Rank | Skill categories | Percentage[a] |
|---|---|---|
| 1 | Communication skills (English) | 39.16 |
| 2 | Critical thinking and problem-solving skills | 17.91 |
| 3 | Moral and professional ethics skills | 11.15 |
| 4 | Entrepreneurial skills | 4.66 |
| 5 | Team-working skills | 13.42 |
| 6 | Leadership skills | 7.88 |
| 7 | Lifelong learning and information management skills | 12.53 |

relevant courses should provide hands-on training in computer programmes and software to ensure that students are IT savvy to face a dynamic and ever-changing working environment. As for training, the lack of communication opportunities in English (both written and verbal) is governed inherently by the type of organizations for placements. Of the 752 students who had undergone industrial training, 82% were attached to government institutions.[16] Students attached to government institutions for practical training and public schools for teaching practicals are more likely to communicate in the Malay language, both verbal and written.

When considering all the seven soft skills for both coursework and training, it can be inferred from that leadership skills and teamwork skills remain almost at the same positions of the ranking. The lack of integration of leadership skills in the formal curriculum must be given due attention since this is also a skill that is perceived as a critical weakness of local graduates (Quah et al. 2009). This implies that these skills are not adequately infused or acquired either by coursework or training. From discussions with employers, it is gauged that trainees are normally given simple tasks that are individualistic given the nature of their training (temporary status and short duration[17]). It is thus more appropriate for the coursework component to ensure adequate infusion and acquisition of both skills since students engaged in training are unlikely to acquire them sufficiently.

The analysis is further extended based on gender and ethnicity (Malays and non-Malays) for both coursework and training to obtain unique clusters of students' perceptions. The results (Appendix Tables 11 and 12) show that

communication skills ranked top as skills embedded in coursework irrespective of gender. Communication skills (including critical thinking skills) in the coursework component as perceived by the male gender explained 31% of the total variance, marginally higher than that as perceived by women at 28% of the total variance. However, differences prevail in the subsequent ranking of the perceived skills acquired by gender. For the male gender, teamworking, lifelong learning and information management skills ranked second (8% of the total variance explained) but for the female gender, moral and professional ethics ranked second (8% of the total variance explained). In the case of skills embedded in the training component (Appendix Tables 13 and 14), the male gender perceived project management skills and team-working as more important, and they are ranked as the top two factors. As for the female gender, moral and professional ethics remain as the most important skills acquired by them through training. Again, the results for the training component should be interpreted with caution given that most of the respondents from the Education discipline are of the female gender and that they all undertake their practicum in public schools. As such, the scope and nature of their training differ considerably from those who undertake practical training with private entities.

The analysis according to broad groups of ethnicity reveals that for the Malays, communication skill is ranked as the most important skill integrated through coursework (Appendix Table 15). But for non-Malays, they rank moral and professional ethics as the most important skill integrated through coursework (Appendix Table 16). When training is considered (Appendix Tables 16 and 17), both Malays and non-Malays perceived moral and professional ethics as most importantly infused and acquired, as that which is obtained for the overall sample.

## Concluding remarks

The study brings to the fore the following. First, the perceived infusion–acquisition of skill types differs

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[16] Caution should be taken when interpreting the results since the lack of adequate integration of communication skills in English language via training may be due to the large number of placement of trainees at government institutions.

[17] The training component of first degree programmes of public universities in Malaysia are basically 3–6 months. Approximately 92% of the respondents underwent a 3-month training stint, which is the minimum requirement for most programmes.

unequivocally between coursework and training, suggesting the complementary nature of both components of the formal curriculum for the integration of soft skills. Second, the infusion–acquisition of soft skills remains highly concentrated on specific items/skills for both coursework and training. In total, the perceived low[18] and selective appreciation of skills by students implies that graduates are still ill-equipped with the necessary competencies. The findings of selective acquisition of certain generic skills in Malaysian universities concur with the study by Aida et al. (2006).

The study therefore brings to the fore the need for improvement in the teaching–learning process of Arts-based programmes (particularly Education, Economics and Business) in public universities. Specifically, the current instructional and assessment strategies still require change that can ensure a better integration of skills. A mere review of the curriculum design (identifying which subjects embed what skill elements to ensure that the students develop the entire range of skills throughout the duration of the programme) to reflect the various soft skills elements obviously does not suffice if the teaching–learning strategies remain weak. Though the wider curriculum of public universities is still undergoing extensive changes at the time of the study under the guiding principles of the MQF, the realized infusion–acquisition of soft skills rests with effective teaching and learning activities in an activating learning environment (Vaatstra and De Vries 2007), beyond the mere conventional environment.

Given the above findings, there are several immediate issues that can be addressed by public universities to ensure a more successful integration of soft skills in the formal curriculum. First, programmes that are solely based on coursework need to add-on the training component as some skills may be best acquired through training. The recognition of practical training in degree programmes is essential as the infusion–acquisition of skills occurs in a wider range of settings, the university and workplace. Second, there is a need for instructors to review their strategies for the integration of skills that are inadequately infused and acquired by students. Further to the teaching

strategies, the course content should be restructured to inject some dynamism that will cultivate lifelong learning and information management skills in line with the changing needs of market demand.

As for training, the duration of training needs to be extended (see also Gurvinder and Sharan 2008; Koo et al. 2009) given that the short-term nature of training does not allow for a meaningful transfer and acquisition of skills. More importantly, selectivity or well-structured placements in organizations for training purposes should be exercised to ensure adequate exposure and better acquisition of skills. In this respect, students (particularly those who are not in the Education discipline) should target placements beyond public to private organizations, large concerns of the industry and relevant organizations to the programme/discipline to encourage deeper learning and ensure maximization of learning capacity at the workplace.

Finally, a caveat on the dataset is that it does not come from a controlled study. Responses were obtained from as many students as possible from the various public universities in the hope of a broad representation. Hence, some suggested conclusions may contain biases, possibly a self-rating bias. Another limitation concerns the findings on the perceived skills' integration in industrial training since a larger number of respondents from the sample are from the Education discipline who are eventually placed in public schools for their practicum. Further, within the Economics and Business discipline, some students also choose placements at government and semi-government institutions. As such, the generalizability of the survey findings from the training component is a concern given the disproportionate number of trainees across the public and private sectors.

Further research is thus needed to replicate this study to cover a larger sampling frame, particularly to include other degree programmes from the Sciences. A comparison of students' perceptions on the integration of soft skills by disciplines/programmes would be useful to provide insights into the effective development of soft skills in public universities. The findings should then be corroborated to those obtained in this study for the Arts and Social Sciences. This would then confirm or negate the main conclusion of the study that the teaching–learning strategies of public universities are not appropriately implemented for the infusion–acquisition of soft skills, at the very least from the students' perspective.

# Appendix

See Tables 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

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[18] In total, only 16% of the respondents claimed that they were very satisfied with the palette of skills acquired through coursework. A majority of respondents (52%) feel that they still lack communication skills, followed closely by 47% each indicating a lack of leadership skills and critical thinking and problem-solving skills, whilst 46% lack entrepreneurship skills.

**Table 6** Soft skill competencies

| Skill type | Competencies |
| --- | --- |
| CS | Convey thoughts with clarity and confidence, in both written and oral forms |
| | Be active listeners and provide the necessary response |
| | Give presentations with clarity and confidence |
| | Able to make presentations with the aid of technology |
| | Able to negotiate and arrive at decisions |
| | Able to communicate with others from different cultures |
| | Able to develop personal communication skills |
| | Able to engage in oral communication |
| CTPS | Able to identify and analyse problems in complex and vague situations, as well as make evaluations that are justifiable |
| | Able to expand and improve thinking skills such as to explain, analyse and evaluate discussions |
| | Able to provide ideas and alternative solutions |
| | Able to think outside the box |
| | Able to make decisions based on concrete evidence |
| | Able to defend and give full attention to responsibilities given |
| | Able to understand and adapt to the new working environment |
| TS | Able to build working relationships, interact with others and work effectively with peers to achieve common goals |
| | Able to understand and undertake the role of a leader and a group member interchangeably |
| | Able to appreciate and respect others' attitude, behaviour and beliefs |
| | Able to contribute to planning and coordinate group efforts |
| | Take responsibility for the group's actions |
| LLIS | Able to search and manage relevant information from various sources |
| | Able to receive new ideas and engage in autonomous learning |
| | Able to develop an enquiry mind |
| ES | Able to identify business opportunities |
| | Able to prepare a business plan |
| | Able to build, explore and take business opportunities |
| | Able to work independently |
| MPES | Able to understand the effects of the economy, environment and socio-cultural factors on the respective professional practice |
| | Able to analyse and arrive at decisions in matters concerning ethics |
| | Able to practice good ethics whilst having a sense of responsibility towards society |
| LS | Knowledge on basic leadership theories |
| | Able to take the lead in projects |
| | Able to understand the role of a leader and a group member and undertake those roles interchangeably |
| | Able to supervise team members |

*Source*: MOHE (2006)

**Table 7** Questionnaire items for coursework component

| Communication skills in English (CS) | |
| --- | --- |
| CS1 | English was widely used in lectures/tutorials |
| CS2 | There were sufficient interactive sessions in lectures/tutorials |
| CS3 | I had opportunities for in-class presentation/microteaching |
| CS4 | Instructors were competent in English |
| Critical thinking and problem-solving skills (CTPS) | |
| CTPS1 | The instructors provided/recommended critical course-related readings |
| CTPS2 | I was given problem-based tasks that included critical enquiry |

**Table 7** continued

| | |
|---|---|
| CTPS3 | I was given reflective (thought-provoking) writing assignments |
| CTPS4 | I received critical feedback on assignments and presentations from instructors |
| CTPS5 | I received critical feedback on presentations from my peers |
| CTPS6 | The instructors integrated theory with practice and real-world experiences in teaching |
| CTPS7 | The instructors integrated economic issues with different areas of knowledge/discipline in teaching |
| CTPS8 | Mid-term and semester exam questions were application based |
| **Team-working skills (TS)** | |
| TS1 | The size of teams/groups was reasonable |
| TS2 | There was good distribution of work within the team |
| TS3 | There was effective (brain-storming session/critical questioning) group work within the team |
| **Lifelong learning and information management skills (LLIMS)** | |
| LLIMS1 | I was given adequate exposure to computer skills (e.g.: programmes and softwares) |
| LLIMS2 | The instructors conveyed ideas and knowledge on contemporary issues |
| LLIMS3 | The learning process of most courses involved active reading/self-regulated learning (e.g.: internet search and library research) |
| **Entrepreneurial skills (ES)** | |
| ES1 | Some courses included formulation of business projects/teaching plans |
| ES2 | Some courses provided knowledge of basic entrepreneurial skills |
| ES3 | There were opportunities to network with entrepreneurs/in-service teachers/expert teachers (e.g.: guest lectures, visits to industry) |
| **Moral and professional ethics skills (MPES)** | |
| MPES1 | The instructors monitored class attendance regularly |
| MPES2 | The instructors monitored and ensured adequate class participation |
| MPES3 | The instructors ensured strict adherence to datelines and submission of assignments |
| MPES4 | The instructors themselves were exemplary of their profession (e.g.: followed time schedules strictly, updated teaching materials, provided adequate consultation hours with students, provided timely feedback on assignments) |
| **Leadership skills (LS)** | |
| LS1 | The courses provided vast opportunities to lead in discussions/presentations |
| LS2 | Some courses provided leadership via fieldwork |
| LS3 | Some courses provided knowledge of basic leadership theories |

**Table 8** Questionnaire items for training component

| | |
|---|---|
| **Communication skills in English (CS)** | |
| CS1 | Communication at workplace was mainly in English |
| CS2 | I wrote reports at work mainly in English |
| CS3 | I had opportunities for making oral presentations/teaching in schools |
| CS4 | I had opportunities to deal with customers/clients/students (e.g.: initiating contact, conduction or having a discussion on phone) |
| CS5 | I had opportunities to observe presentations made by management/head teachers |
| CS6 | I expressed my thoughts in meetings/discussions at the organization |
| **Critical thinking and problem-solving skills (CTPS)** | |
| CTPS1 | Tasks given were problem-centred |
| CTPS2 | Training provides opportunities to relate theory with practice |
| CTPS3 | I was given critical feedback on tasks by the organization supervisor/school leader |
| CTPS4 | I was adequately exposed to and engaged in discussions that promoted innovative and creative ideas |
| **Team-working skills (TS)** | |
| TS1 | I had opportunities to be directly involved in teamwork |

**Table 8** continued

| | |
|---|---|
| TS2 | I had opportunities to be an observant in team discussions |
| TS3 | I was able to interact freely to achieve given tasks |
| TS4 | I acquired skills on work coordination and work management within teams |
| Lifelong learning and information management skills (LLIMS) | |
| LLIMS1 | My work involved regular use of computers |
| LLIMS2 | I was directly involved in data input/analysis/management of databases |
| LLIMS3 | I was able to use my computer skills at the organization |
| LLIMS4 | I acquired new skills on information management at the organization |
| LLIMS5 | The tasks required me to actively seek information through research to enhance my work output |
| LLIMS6 | I am able to identify/apply the new knowledge acquired through training to my current study |
| Entrepreneurial skills (ES) | |
| ES1 | I was directly involved in specific projects |
| ES2 | I participated in project discussions |
| ES3 | I acquired specific industrial knowledge on project development, maintenance and promotion |
| ES4 | I am now able to identify new business opportunities |
| Moral and professional ethics skills (MPES) | |
| MPES1 | Punctuality to work was strictly monitored by the organization supervisor/school leadership |
| MPES2 | My tasks were monitored closely by my organization supervisor/school leader through regular exchange |
| MPES3 | The organization supervisor/peers/school leadership guided me well on general ethical practices at work |
| MPES4 | I was exposed to other aspects of good work ethics (e.g.: honesty, integrity) at the organization |
| MPES5 | The organization supervisor/school leader upheld good professional ethics to be followed by the staff |
| Leadership skills (LS) | |
| LS1 | I had opportunities to manage tasks independently |
| LS2 | I had opportunities to be involved in decision-making/finding solutions |
| LS3 | I participated actively in the organization of events/meetings |
| LS4 | I had to meet job demands under stressful conditions |
| LS5 | I have provided input for the improvisation of work systems at the organization |

**Table 9** Public universities in Malaysia

| No. | Year | University | Surveyed |
|---|---|---|---|
| University | | | |
| 1 | 1962 | Universiti Malaya (UM) | ✔ |
| 2 | 1969 | Universiti Sains Malaysia (USM) | ✔ |
| 3 | 1970 | Universiti Kebangsaan Malaysia (UKM) | ✔ |
| 4 | 1971 | Universiti Putra Malaysia (UPM) | ✔ |
| 5 | 1975 | Universiti Teknologi Malaysia (UTM) | |
| 6 | 1983 | Universiti Islam Antarabangsa (UIAM) | |
| 7 | 1984 | Universiti Utara Malaysia (UUM) | ✔ |
| 8 | 1992 | Universiti Malaysia Sarawak (UNIMAS) | ✔ |
| 9 | 1994 | Universiti Malaysia Sabah (UMS) | ✔ |
| 10 | 1996 | Universiti Teknologi Mara (UiTM) | ✔ |
| 11 | 1997 | Universiti Pendidikan Sultan Idris (UPSI) | |
| 12 | 2005 | Universiti Darul Iman Malaysia (UDM) | |
| 13 | 2006 | Universiti Malaysia Kelantan (UMK) | |
| 14 | 2006 | Universiti Pertahanan Nasional Malaysia (UPNM) | |
| University (upgraded from university college) | | | |
| 15 | 1998 | Kolej Universiti Islam Malaysia (KUIM), renamed as Universiti Sains Islam Malaysia (USIM) | |
| 16 | 1999 | Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM), renamed as Universiti Malaysia Terengganu (UMT) | |

**Table 9** continued

| No. | Year | University | Surveyed |
|-----|------|------------|----------|
| 17 | 2000 | Kolej Universiti Teknologi Tun Hussein Onn (KUiTTHO), renamed as Universiti Tun Hussein Onn Malaysia (UTHM) | |
| 18 | 2000 | Kolej Universiti Teknikal Kebangsaan Malaysia (KUKTM), renamed as Universiti Teknikal Malaysia Melaka (UTeM) | |
| 19 | 2002 | Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM), renamed as Universiti Malaysia Perlis (UniMAP) | |
| 20 | 2002 | Kolej Universiti Kejuruteraan dan Teknologi Malaysia (KUKTEM), renamed as Universiti Malaysia Pahang (UMP) | |

*Source*: MOHE

**Table 10** Profile of respondents

The population refers to first degree enrolment in Education, Arts and Social Sciences in the above-mentioned universities in 2008. The population for the Faculty/School of Economics and Business are estimated based on the total. Enrolment for the Arts and Social Sciences discipline, as specific data for the former are not available. n.a. not available

| Item | Percentage of respondents ($N = 1803$) | Percentage of population* |
|------|------|------|
| *University* | | |
| UM | 11.4 | 8.0 |
| UKM | 25.5 | 9.8 |
| UiTM | 16.4 | 27.9 |
| USM | 15.3 | 8.7 |
| UNIMAS | 5.5 | 3.0 |
| UMS | 9.3 | 8.4 |
| UUM | 6.9 | 24.2 |
| UPM | 9.7 | 9.9 |
| *Faculty/school* | | |
| Education | 65.7 | 13.3 |
| Economics and Business | 34.3 | 86.7 |
| *Nationality* | | (Based on enrolment for first degree programmes) |
| Malaysian | 97.8 | 95.8 |
| Others | 2.2 | 4.2 |
| *Gender* | | |
| Male | 23.2 | 29.1 |
| Female | 76.8 | 70.9 |
| *Race* | | (Based on 2008 intake for first degree programmes in public universities) |
| Malay | 68.2 | 62.2 |
| Chinese | 23.1 | 31.0 |
| Indian | 3.7 | 6.8 |
| Others | 5.2 | |
| *Religion* | | |
| Islam | 68.1 | n.a. |
| Christian | 10.5 | n.a. |
| Buddhist | 18.1 | n.a. |
| Hindu | 2.8 | n.a. |
| Others | 0.4 | n.a. |

**Table 11** Factor analysis of male students' perceptions on skill embedment in coursework

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|-------------------|--------------|-------------|----------------------|--------------|------------------|
| Communication and critical thinking skills | | 8.727 | 31.167 | 31.167 | 0.800 |
| Instructors competent in English | 0.717 | | | | |
| Wide usage of English in lectures/tutorials | 0.713 | | | | |

**Table 11** continued

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Opportunities for in-class presentation/microteaching | 0.661 | | | | |
| Sufficient interactive sessions in lectures/tutorials | 0.554 | | | | |
| Given problem-based tasks that included critical enquiry | 0.545 | | | | |
| Instructors provided/recommended critical course-related readings | 0.537 | | | | |
| Given reflective (thought-provoking) writing assignments | 0.481 | | | | |
| Team-working, lifelong learning and information management skills | | 2.122 | 7.58 | 38.745 | 0.806 |
| Effective (brain-storming session/critical questioning) group work within teams | 0.792 | | | | |
| Good distribution of work within teams | 0.788 | | | | |
| Reasonable size of teams/groups | 0.604 | | | | |
| Given adequate exposure to computer skills | 0.604 | | | | |
| Instructors conveyed ideas and knowledge on contemporary issues | 0.443 | | | | |
| Learning process of most courses involved active reading/ self-regulated learning | 0.403 | | | | |
| Entrepreneurial skills | | 1.604 | 5.728 | 44.473 | 0.796 |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 0.793 | | | | |
| Some courses included formulation of business projects/teaching plans | 0.780 | | | | |
| Some courses provided knowledge of basic entrepreneurial skills | 0.762 | | | | |
| Some courses provided leadership via fieldwork | 0.465 | | | | |
| Moral and professional ethics | | 1.312 | 4.686 | 49.160 | 0.785 |
| Instructors monitored class attendance regularly | 0.797 | | | | |
| Instructors monitored and ensured adequate class participation | 0.725 | | | | |
| Instructors ensured strict adherence to datelines and submission of assignments | 0.708 | | | | |
| Instructors themselves were exemplary of their profession | 0.630 | | | | |
| Courses provided vast opportunities to lead in discussions/presentations | 0.407 | | | | |
| Contextual application | | 1.182 | 4.223 | 53.383 | 0.652 |
| Instructors integrated economic issues with different areas of knowledge/ discipline in teaching | 0.696 | | | | |
| Mid-term and semester exam questions were application based | 0.617 | | | | |
| Instructors integrated theory with practice and real-world experiences in teaching | 0.571 | | | | |
| Critical feedback | | 1.071 | 3.824 | 57.206 | 0.696 |
| Received critical feedback on presentations from instructors | 0.572 | | | | |
| Received critical feedback on assignments and presentations from my peers | 0.560 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy = 0.912; Bartlett test of sphericity = 4431.442; $p < 0.000$

**Table 12** Factor analysis of female students' perceptions on skill embedment in coursework

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Communication skills | | 7.756 | 27.700 | 27.700 | 0.757 |
| English was widely used in lectures/tutorials | 0.810 | | | | |
| Instructors were competent in English | 0.749 | | | | |
| Opportunities for in-class presentation/microteaching | 0.593 | | | | |

**Table 12** continued

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Sufficient interactive sessions in lectures/tutorials | 0.576 | | | | |
| Instructors provided/recommended critical course-related readings | 0.434 | | | | |
| Moral and professional ethics | | 2.284 | 8.157 | 35.856 | 0.767 |
| Instructors monitored and ensured adequate class participation | 0.752 | | | | |
| Instructors monitored class attendance regularly | 0.703 | | | | |
| Instructors ensured strict adherence to datelines and submission of assignments | 0.670 | | | | |
| Instructors themselves were exemplary of their profession | 0.638 | | | | |
| Critical thinking and problem-solving skills | | 1.621 | 5.790 | 41.646 | 0.755 |
| Received critical feedback on presentations from my peers | 0.771 | | | | |
| Received critical feedback on assignments and presentations from instructors | 0.745 | | | | |
| Given reflective (thought-provoking) writing assignments | 0.536 | | | | |
| Given problem-based tasks that included critical enquiry | 0.501 | | | | |
| Instructors integrated theory with practice and real-world experiences in teaching | 0.438 | | | | |
| Entrepreneurial skills | | 1.328 | 4.744 | 46.390 | 0.699 |
| Some courses provided knowledge of basic entrepreneurial skills | 0.818 | | | | |
| Some courses included formulation of business projects/teaching plans | 0.685 | | | | |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 0.661 | | | | |
| Instructors integrated economic issues with different areas of knowledge/discipline in teaching | 0.620 | | | | |
| Team-working skills | | 1.260 | 4.501 | 50.891 | 0.750 |
| Good distribution of work within teams | 0.828 | | | | |
| Effective (brain-storming session/critical questioning) group work within teams | 0.778 | | | | |
| Reasonable size of teams/groups | 0.653 | | | | |
| Leadership skills | | 1.175 | 4.197 | 55.088 | 0.769 |
| Some courses provided leadership via fieldwork | 0.807 | | | | |
| Some courses provided knowledge of basic leadership theories | 0.777 | | | | |
| Courses provided vast opportunities to lead in discussions/presentations | 0.604 | | | | |
| Lifelong learning and information management skills | | 1.092 | 3.901 | 58.989 | 0.686 |
| Given adequate exposure to computer skills | 0.707 | | | | |
| Instructors conveyed ideas and knowledge on contemporary issues | 0.657 | | | | |
| Learning process of most courses involved active reading/self-regulated learning | 0.635 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy = 0.905; Bartlett test of sphericity = 13018.911; $p < 0.000$

**Table 13** Factor analysis of male students' perceptions on skill embedment via training

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Project management skills | | 12.357 | 36.345 | 36.345 | 0.988 |
| Participated in project discussions | 0.833 | | | | |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 0.821 | | | | |
| Directly involved in specific projects | 0.766 | | | | |

**Table 13** continued

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Able to identify new business opportunities | 0.757 | | | | |
| Expressed my thoughts in meetings/discussions at the organization | 0.645 | | | | |
| Directly involved in data input/analysis/management of databases | 0.466 | | | | |
| Opportunities to observe presentations made by management/head teachers | 0.455 | | | | |
| Team-working skills | | 2.646 | 7.784 | 44.129 | 0.994 |
| Opportunities to be an observant in team discussions | 0.816 | | | | |
| Acquired skills on work coordination and work management within teams | 0.704 | | | | |
| Opportunities to relate theory with practice | 0.689 | | | | |
| Opportunities to be directly involved in teamwork | 0.675 | | | | |
| Able to interact freely to achieve given tasks | 0.656 | | | | |
| Given critical feedback on tasks by the organization supervisor/school leader | 0.474 | | | | |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 0.405 | | | | |
| Moral and professional ethics | | 1.987 | 5.844 | 49.973 | 0.993 |
| Good guidance from organization supervisor/peers/school leadership on general ethical practices at work | 0.791 | | | | |
| Tasks were monitored closely by organization supervisor/school leader through regular exchange | 0.771 | | | | |
| Organization supervisor/school leader upheld good professional ethics to be followed by the staff | 0.721 | | | | |
| Exposed to other aspects of good work ethics at organization | 0.665 | | | | |
| Punctuality to work was strictly monitored by organization supervisor/school leadership | 0.649 | | | | |
| Lifelong learning and information management skills | | 1.591 | 4.678 | 54.651 | 0.989 |
| Work involved regular use of computers | 0.741 | | | | |
| Acquired new skills on information management at the organization | 0.706 | | | | |
| Able to use my computer skills at the organization | 0.670 | | | | |
| Tasks required me to actively seek information through research to enhance work output | 0.594 | | | | |
| Able to identify/apply the new knowledge acquired through training to my current study | 0.487 | | | | |
| Innovative skills | | 1.394 | 4.101 | 58.752 | 0.990 |
| Provided input for the improvisation of work systems at organization | 0.747 | | | | |
| Participated actively in the organization of events/meetings | 0.637 | | | | |
| Opportunities to manage tasks independently | 0.576 | | | | |
| Opportunities to be involved in decision-making/finding solutions | 0.552 | | | | |
| Had to meet job demands under stressful conditions | 0.535 | | | | |
| Communication skills | | 1.292 | 3.800 | 62.552 | 0.982 |
| Opportunities for making oral presentations/teaching in schools | 0.715 | | | | |
| Opportunities to deal with customers/clients/students | 0.596 | | | | |
| Tasks given were problem-centred | 0.590 | | | | |
| English proficiency | | 1.166 | 3.428 | 65.980 | 0.930 |
| Communication at workplace was mainly in English | 0.712 | | | | |
| Wrote reports at work mainly in English | 0.711 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy $= 0.885$; Bartlett test of sphericity $= 3103.112$; $p < 0.000$

**Table 14** Factor analysis of female students' perceptions on skill embedment via training

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Moral and professional ethics | | 11.033 | 32.450 | 32.450 | 0.993 |
| Exposed to other aspects of good work ethics at organization | 0.845 | | | | |
| Punctuality to work was strictly monitored by the organization supervisor/ school leadership | 0.798 | | | | |
| Good guidance from organization supervisor/peers/school leadership on general ethical practices at work | 0.790 | | | | |
| Organization supervisor/school leader upheld good professional ethics to be followed by staff | 0.783 | | | | |
| Tasks were monitored closely by my organization supervisor/school leader through regular exchange | 0.755 | | | | |
| Project management skills | | 2.923 | 8.596 | 41.046 | 0.978 |
| Participated in project discussions | 0.856 | | | | |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 0.855 | | | | |
| Directly involved in specific projects | 0.823 | | | | |
| Able to identify new business opportunities | 0.799 | | | | |
| Lifelong learning and information management skills | | 2.375 | 6.986 | 48.033 | 0.988 |
| Directly involved in data input/analysis/management of databases | 0.782 | | | | |
| Work involved regular use of computers | 0.748 | | | | |
| Able to use my computer skills at the organization | 0.743 | | | | |
| Acquired new skills on information management at the organization | 0.705 | | | | |
| Able to identify/apply the new knowledge acquired through training to my current study | 0.496 | | | | |
| Tasks required me to actively seek information through research to enhance my work output | 0.455 | | | | |
| Team-working skills | | 1.849 | 5.438 | 53.471 | 0.990 |
| Opportunities to be an observant in team discussions | 0.802 | | | | |
| Acquired skills on work coordination and work management within teams | 0.767 | | | | |
| Able to interact freely to achieve given tasks | 0.740 | | | | |
| Opportunities to be directly involved in teamwork | 0.716 | | | | |
| Innovative skills | | 1.477 | 4.343 | 57.814 | 0.986 |
| Had to meet job demands under stressful conditions | 0.717 | | | | |
| Had opportunities to be involved in decision-making/finding solutions | 0.712 | | | | |
| Participated actively in the organization of events/meetings | 0.686 | | | | |
| Provided input for the improvisation of work systems at the organization | 0.663 | | | | |
| Opportunities to manage tasks independently | 0.626 | | | | |
| Critical feedback and contextual application | | 1.219 | 3.585 | 61.399 | 0.983 |
| Given critical feedback on tasks by the organization supervisor/school leader | 0.700 | | | | |
| Training provides opportunities to relate theory with practice | 0.695 | | | | |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 0.679 | | | | |
| Tasks given were problem-centred | 0.515 | | | | |
| English proficiency | | 1.185 | 3.485 | 64.884 | 0.943 |
| Wrote reports at work mainly in English | 0.782 | | | | |
| Communication at workplace was mainly in English | 0.672 | | | | |
| Opportunities for making oral presentations/teaching in schools | 0.567 | | | | |
| Communication skills | | 1.003 | 2.949 | 67.833 | 0.953 |
| Opportunities to deal with customers/clients/students | 0.759 | | | | |

**Table 14** continued

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Opportunities to observe presentations made by management/head teachers | 0.753 | | | | |
| Expressed my thoughts in meetings/discussions at the organization | 0.431 | | | | |

Principal components factor analysis with varimax rotation, KMO measure of sampling adequacy = 0.917; Bartlett test of sphericity = 11597.319; $p < 0.000$

**Table 15** Factor analysis of Malay students' perceptions on skill embedment in coursework

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Communication skills | | 8.296 | 29.628 | 29.628 | 0.757 |
| English was widely used in lectures/tutorials | 0.792 | | | | |
| Instructors were competent in English | 0.739 | | | | |
| Opportunities for in-class presentation/microteaching | 0.672 | | | | |
| Sufficient interactive sessions in lectures/tutorials | 0.597 | | | | |
| Critical thinking and problem-solving skills | | 2.387 | 8.526 | 38.154 | 0.794 |
| Received critical feedback on assignments and presentations from instructors | 0.767 | | | | |
| Received critical feedback on presentations from my peers | 0.739 | | | | |
| Given reflective (thought-provoking) writing assignments | 0.603 | | | | |
| Given problem-based tasks that included critical enquiry | 0.547 | | | | |
| Instructors provided/recommended critical course-related readings | 0.502 | | | | |
| Instructors integrated theory with practice and real-world experiences in teaching (course content) | 0.417 | | | | |
| Moral and professional ethics | | 1.503 | 5.369 | 43.523 | 0.782 |
| Instructors monitored and ensured adequate class participation | 0.750 | | | | |
| Instructors monitored class attendance regularly | 0.746 | | | | |
| Instructors ensured strict adherence to datelines and submission of assignments | 0.712 | | | | |
| Instructors themselves were exemplary of their profession | 0.646 | | | | |
| Entrepreneurial skills | | 1.378 | 4.923 | 48.445 | 0.757 |
| Some courses provided knowledge of basic entrepreneurial skills | 0.822 | | | | |
| Some courses included formulation of business projects/teaching plans | 0.735 | | | | |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 0.675 | | | | |
| Instructors integrated economic issues with different areas of knowledge/discipline in teaching | 0.616 | | | | |
| Team-working skills | | 1.208 | 4.315 | 52.761 | 0.760 |
| Good distribution of work within teams | 0.808 | | | | |
| Effective (brain-storming session/critical questioning) group work within teams | 0.776 | | | | |
| Reasonable size of teams/groups | 0.678 | | | | |
| Leadership skills | | 1.071 | 3.824 | 56.584 | 0.752 |
| Some courses provided leadership via fieldwork | 0.802 | | | | |
| Some courses provided knowledge of basic leadership theories | 0.793 | | | | |
| Courses provided vast opportunities to lead in discussions/presentations | 0.593 | | | | |
| Given adequate exposure to computer skills | 0.596 | | | | |
| Lifelong learning and information management skills | | 1.024 | 3.658 | 60.243 | 0.662 |
| Learning process of most courses involved active reading | 0.587 | | | | |
| Instructors conveyed ideas and knowledge on contemporary issues | 0.572 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy = 0.920; Bartlett test of sphericity = 12323.415; $p < 0.000$

**Table 16** Factor analysis of non-Malay students' perceptions on skill embedment in coursework

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Moral and professional ethics | | 7.145 | 25.516 | 25.516 | 0.736 |
| Instructors monitored and ensured adequate class participation | 0.738 | | | | |
| Instructors monitored class attendance regularly | 0.694 | | | | |
| Instructors themselves were exemplary of their profession | 0.674 | | | | |
| Instructors ensured strict adherence to datelines and submission of assignments | 0.579 | | | | |
| Critical thinking and problem-solving skills | | 2.102 | 7.508 | 33.025 | 0.725 |
| Given reflective (thought-provoking) writing assignments | 0.762 | | | | |
| Given problem-based tasks that included critical enquiry | 0.748 | | | | |
| Instructors provided/recommended critical course-related readings | 0.471 | | | | |
| Opportunities for in-class presentation/microteaching | 0.428 | | | | |
| Instructors integrated theory with practice and real-world experiences in teaching | 0.410 | | | | |
| Mid-term and semester exam questions were application based | 0.374 | | | | |
| Entrepreneurial skills | | 1.681 | 6.004 | 39.029 | 0.727 |
| Some courses provided knowledge of basic entrepreneurial skills | 0.814 | | | | |
| Opportunities to network with entrepreneurs/in-service teachers/expert teachers | 0.687 | | | | |
| Some courses included formulation of business projects/teaching plans | 0.650 | | | | |
| Instructors integrated economic issues with different areas of knowledge/discipline in teaching | 0.551 | | | | |
| Team-working skills | | 1.437 | 5.133 | 44.162 | 0.743 |
| Good distribution of work within teams | 0.840 | | | | |
| There was effective (brain-storming session/critical questioning) group work within teams | 0.751 | | | | |
| Reasonable size of teams/groups | 0.639 | | | | |
| Communication skills | | 1.340 | 4.787 | 48.949 | 0.661 |
| English was widely used in lectures/tutorials | 0.812 | | | | |
| Instructors were competent in English | 0.800 | | | | |
| Sufficient interactive sessions in lectures/tutorials | 0.459 | | | | |
| Leadership skills | | 1.260 | 4.499 | 53.448 | 0.730 |
| Some courses provided leadership via fieldwork | 0.767 | | | | |
| Some courses provided knowledge of basic leadership theories | 0.729 | | | | |
| Vast opportunities to lead in discussions/presentations | 0.600 | | | | |
| Lifelong learning and information management skills | | 1.087 | 3.882 | 57.329 | 0.671 |
| Given adequate exposure to computer skills | 0.800 | | | | |
| Learning process of most courses involved active reading | 0.637 | | | | |
| Instructors conveyed ideas and knowledge on contemporary issues | 0.626 | | | | |
| Critical feedback | | 1.067 | 3.810 | 61.139 | 0.693 |
| Received critical feedback on presentations from my peers | 0.804 | | | | |
| Received critical feedback on assignments and presentations from instructors | 0.667 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy $= 0.868$; Bartlett test of sphericity $= 5080.543$; $p < 0.000$

**Table 17** Factor analysis of Malay students' perceptions on skill embedment via training

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Moral and professional ethics | | 10.297 | 30.284 | 30.284 | 0.994 |
| Exposed to other aspects of good work ethics at the organization | 0.817 | | | | |
| Good guidance from organization supervisor/peers/school leadership guided on general ethical practices at work | 0.784 | | | | |
| Punctuality to work was strictly monitored by organization supervisor/ school leadership | 0.780 | | | | |
| Organization supervisor/school leader upheld good professional ethics to be followed by the staff | 0.750 | | | | |
| Tasks were monitored closely by my organization supervisor/school leader through regular exchange | 0.732 | | | | |
| Project management skills | | 3.204 | 9.425 | 39.709 | 0.979 |
| Participated in project discussions | 0.869 | | | | |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 0.862 | | | | |
| Directly involved in specific projects | 0.847 | | | | |
| Able to identify new business opportunities | 0.804 | | | | |
| Expressed my thoughts in meetings/discussions at the organization | 0.450 | | | | |
| Lifelong learning and information management skills | | 2.492 | 7.330 | 47.038 | 0.989 |
| Able to use my computer skills at the organization | 0.747 | | | | |
| Work involved regular use of computers | 0.741 | | | | |
| Directly involved in data input/analysis/management of databases | 0.721 | | | | |
| Acquired new skills on information management at the organization | 0.678 | | | | |
| Tasks required me to actively seek information through research to enhance my work output | 0.600 | | | | |
| Able to identify/apply the new knowledge acquired through training to my current study | 0.544 | | | | |
| Innovative skills | | 1.751 | 5.151 | 52.189 | 0.989 |
| Participated actively in the organization of events/meetings | 0.736 | | | | |
| Had to meet job demands under stressful conditions | 0.729 | | | | |
| Provided input for the improvisation of work systems at the organization | 0.706 | | | | |
| Opportunities to be involved in decision-making/finding solutions | 0.688 | | | | |
| Opportunities to manage tasks independently | 0.665 | | | | |
| Team-working skills | | 1.391 | 4.091 | 56.280 | 0.991 |
| Opportunities to be an observant in team discussions | 0.808 | | | | |
| Acquired skills on work coordination and work management within teams | 0.752 | | | | |
| Able to interact freely to achieve given tasks | 0.699 | | | | |
| Opportunities to be directly involved in teamwork | 0.676 | | | | |
| Critical feedback and contextual application | | 1.351 | 3.974 | 60.254 | 0.986 |
| Training provides opportunities to relate theory with practice | 0.730 | | | | |
| Given critical feedback on tasks by the organization supervisor/school leader | 0.669 | | | | |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 0.642 | | | | |
| Tasks given were problem-centred | 0.437 | | | | |
| English proficiency | | 1.250 | 3.677 | 63.931 | 0.946 |
| Wrote reports at work mainly in English | 0.789 | | | | |
| Communication at workplace was mainly in English | 0.708 | | | | |
| Opportunities for making oral presentations/teaching in schools | 0.630 | | | | |
| Communication skills | | 1.055 | 3.102 | 67.033 | 0.958 |
| Opportunities to observe presentations made by management/head teachers | 0.797 | | | | |
| Opportunities to deal with customers/clients/students | 0.735 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy = 0.908; Bartlett test of sphericity = 9545.542; $p < 0.000$

**Table 18** Factor analysis of non-Malay students' perceptions on skill embedment via training

| Factor dimensions | Factor loads | Eigenvalues | % Variance explained | Cumulative % | Cronbach's alpha |
|---|---|---|---|---|---|
| Moral and professional ethics | | 12.792 | 37.623 | 37.623 | 0.992 |
| Organization supervisor/school leader upheld good professional ethics to be followed by the staff | 0.815 | | | | |
| Exposed to other aspects of good work ethics at the organization | 0.815 | | | | |
| Tasks were monitored closely by my organization supervisor/school leader through regular exchange | 0.801 | | | | |
| Punctuality to work was strictly monitored by the organization supervisor/school leadership | 0.779 | | | | |
| Organization supervisor/peers/school leadership guided me well on general ethical practices at work | 0.775 | | | | |
| Given critical feedback on tasks by the organization supervisor/school leader | 0.490 | | | | |
| Team-working skills and contextual application | | 2.467 | 7.256 | 44.879 | 0.992 |
| Opportunities to be an observant in team discussions | 0.829 | | | | |
| Acquired skills on work coordination and work management within teams | 0.777 | | | | |
| Able to interact freely to achieve given tasks | 0.759 | | | | |
| Opportunities to be directly involved in teamwork | 0.756 | | | | |
| Training provides opportunities to relate theory with practice | 0.548 | | | | |
| Able to identify/apply the new knowledge acquired through training to my current study | 0.502 | | | | |
| Adequately exposed to and engaged in discussions that promoted innovative and creative ideas | 0.484 | | | | |
| Tasks given were problem-centred | 0.439 | | | | |
| Tasks required me to actively seek information through research to enhance my work output | 0.412 | | | | |
| Project management skills | | 2.345 | 6.897 | 51.776 | 0.979 |
| Participated in project discussions | 0.826 | | | | |
| Acquired specific industrial knowledge on project development, maintenance and promotion | 0.818 | | | | |
| Able to identify new business opportunities | 0.762 | | | | |
| Directly involved in specific projects | 0.742 | | | | |
| Participated actively in the organization of events/meetings | 0.506 | | | | |
| Provided input for the improvisation of work systems at the organization | 0.498 | | | | |
| Lifelong learning and information management skills | | 1.745 | 5.132 | 56.908 | 0.980 |
| Able to use my computer skills at the organization | 0.751 | | | | |
| Work involved regular use of computers | 0.721 | | | | |
| Acquired new skills on information management at the organization | 0.711 | | | | |
| Directly involved in data input/analysis/management of databases | 0.708 | | | | |
| Communications skills | | 1.418 | 4.172 | 61.079 | 0.967 |
| Expressed my thoughts in meetings/discussions at the organization | 0.707 | | | | |
| Opportunities to deal with customers/clients/students | 0.636 | | | | |
| Opportunities to observe presentations made by management/head teachers | 0.564 | | | | |
| Opportunities for making oral presentations/teaching in schools | 0.478 | | | | |
| Innovative skills | | 1.097 | 3.225 | 64.305 | 0.974 |
| Opportunities to be involved in decision-making/finding solutions | 0.640 | | | | |
| Opportunities to manage tasks independently | 0.593 | | | | |
| Had to meet job demands under stressful conditions | 0.564 | | | | |
| English proficiency | | 1.040 | 3.058 | 67.363 | 0.919 |
| Wrote reports at work mainly in English | 0.696 | | | | |
| Communication at workplace was mainly in English | 0.621 | | | | |

Principal components factor analysis with varimax rotation. KMO measure of sampling adequacy $= 0.907$; Bartlett test of sphericity $= 5019.779$; $p < 0.000$

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