

Professional standing of partially or wholly licensed engineering programs in the Malaysian context

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Abstract: *Australian universities conduct their overseas engineering programs using a variety of arrangements including a partially licensed model. This paper reviews the existing implementation models for the delivery of engineering education programs in Malaysia by Australian universities, and contextualizes the licensed operating mode as an alternative delivery framework. It then examines the characteristics of partially or wholly licensed engineering programs from an accreditation perspective, and undertakes a study of the regulatory frameworks applicable for such programs within Australia and in Malaysia. Finally the paper reports the current working relationship between Engineers Australia and the Engineering Accreditation Council in Malaysia (and its components), and suggests a set of quality assurance guidelines and processes sufficient to enable joint accreditation of undifferentiated engineering degree programs including partially or fully licensed engineering programs.*

Introduction

In 2002, Deakin University commenced offering articulated offshore Bachelor of Engineering programs in conjunction with its partner organisation, Kolej Damansara Utama (KDU) College (with campuses in Penang and Kuala Lumpur), to students holding appropriate diplomas from the partner and other similar institutions. The students enrolled directly into the third year of the Deakin program in external mode, and studied using distance learning resources, receiving tutoring and supervisory support from the teaching staff at KDU College.

In response to a change in Malaysian government regulations regarding offshore degree programs fully offered within Malaysia, a new agreement was signed and implemented in 2006. The agreement provides for licensing of the study materials for the first 2.5 years (5 semesters) of the program for full delivery by local teaching staff at KDU College in traditional classroom mode, with assessment components moderated by Deakin University. Students will revert to enrolling into Deakin's Bachelor of Engineering degree as external students for the final 1.5 years (3 semesters) of their study and will be required to attend the Australian home campus for one two-week period. During this final 1.5 years, students will study using distance learning resources and will again receive tutoring assistance and supervision from teaching staff members of KDU College. The overall program delivery could thus be described to be in accordance with a 'semi-licensed' model.

The Ministry of Higher Education (MOHE), on the advice of the Malaysian Government's National Accreditation Board (Lembaga Akreditasi Negara, LAN), has granted approval to conduct this program within Malaysia in partnership with KDU College. The process of attaining accreditation for this program from the appropriate professional registration body, the Board of Engineers, Malaysia (BEM), is currently under discussion. In Malaysia, BEM undertakes the task of accreditation of professional engineering education programs through the Engineering Accreditation Council (EAC).

In addition, the licensed model will need to be submitted for professional accreditation by the Australian accreditation authority, Engineers Australia, in order to achieve full international recognition and to facilitate the international mobility of engineering graduates.

Engineers Australia is a foundation signatory to the Washington Accord, an umbrella body recognising the substantial equivalence of accreditation systems in signatory nations. The BEM is currently a provisional signatory to the Washington Accord. Engineers Australia has been appointed as a mentor for the EAC in Malaysia to assist in its bid for full signatory status. For the past 5 years, Engineers Australia has been undertaking accreditation visits to evaluate engineering education offerings by Australian universities at offshore locations. Engineers Australia is bound by the Washington Accord to work with local accreditation bodies in the accreditation of engineering programs offered by Australian educational institutions at overseas locations.

The new development by Deakin University will, for the first time, provide for the delivery of an Australian engineering education program at a separate overseas institution, on a licensed basis. Under the licensing arrangement, Deakin University maintains responsibility for quality assurance aspects of the operation. This new approach to offshore program implementation requires Engineers Australia to consider appropriate accreditation guidelines and practices, incorporating QA expectations which are known and understood by all parties.

In order to fully explore the environment within which licensed engineering programs within Malaysia would be required to operate, this paper reviews the existing implementation models for the delivery of engineering education programs in Malaysia by Australian universities, and contextualizes the licensed operating mode as an alternative delivery framework. It then examines the characteristics of partially or wholly licensed engineering programs from an accreditation perspective, and undertakes a study of the regulatory frameworks applicable for such programs within Australia and in Malaysia. Finally the paper reports the current working relationship between Engineers Australia and EAC (and its components), and develops a set of quality assurance guidelines and processes sufficient to enable joint accreditation of undifferentiated engineering degree programs including partially or fully licensed engineering programs.

The paper is based on a project study conducted by a team consisting of representatives from Deakin University and Engineers Australia, with a grant from the Australian Vice-Chancellors Committee (AVCC).

Australian university offshore program models in Malaysia

Overseas engineering programs were conducted by Australian universities using a variety of arrangements. In some instances, Australian universities established an offshore campus, operated in accordance with both Australian and local requirements, but conducted by the Australian institution. A more common approach has been to enter into what are defined by Engineers Australia as twinning partnerships. Some 12 Australian universities now offer engineering education programs at overseas locations, either through offshore campuses or through partnerships with international and local organisations. In each case these program offerings are claimed to be undifferentiated from programs implemented with the same degree title on the home campus of the respective educational institution. An undifferentiated program offering implemented at a remote location is argued to deliver the same educational objectives and graduate outcomes as that of the host program implemented on the home campus of an educational institution. The degree testamur will be identical for both the host and remote implementations and may not generally identify the specific location of delivery. A twinning arrangement may involve recognition by the Australian university that the first (say) two to four semesters of an overseas institution's curriculum is equivalent to its own, or that a sub-degree qualification completed elsewhere will attract a defined level of credit and recognised entry point to the Australian program. Alternatively, it may involve the overseas institution specifically teaching the first (say) two to four semesters of the Australian university's curriculum, with or without some assistance from Australian staff.

Three Australian universities operate offshore Foreign Branch Campus Universities in Malaysia and offer undifferentiated engineering programs at these institutions. Other Australian universities have

twinning arrangements with specific providers - in this context, overseas institutions operating in Malaysia or Malaysian institutions - whereby students undertake the initial stage/s of a program with the partner institution and then transfer to an Australian university conducted program, with predetermined credit. The program is completed either in Australia or in Malaysia to qualify for the award. For Malaysian delivery of this latter component, a partnership agreement with a local institution would most likely provide the operating environment for the Australian university.

Licensing of engineering programs

The new development by Deakin University in partnership with KDU College Malaysia, will, for the first time, provide for the delivery of engineering education programs on a semi-licensed basis. In this case, the first five semesters (2.5 years) of the program are licensed by Deakin University to KDU College, to be taught independently by its academic staff. This teaching is done using materials and procedures provided in accordance with a commercial agreement reached between the two institutions. Deakin University also undertakes to provide the quality assurance function for these five semesters. The remaining three semesters (1.5 years) of the full time program are offered directly by Deakin University using the facilities and resources of KDU College to support external mode delivery. As part of this 're-packaging' process, and in accordance with recently revised Malaysian Government requirements, holders of locally gained diplomas will now be granted only two semesters advanced standing, compared with up to four under previous arrangements.

This new partially licensed approach to offshore program implementation requires Engineers Australia to develop appropriate accreditation guidelines, incorporating quality assurance expectations which are known and understood by all parties. From an accreditation perspective, there are key differences between the earlier twinning model and the new licensed approach which must be considered before professional body accreditation can be addressed. The local institution now has a more significant level of autonomy and control over the conduct of the first five semesters of work than is the case during the second phase where it simply supports delivery by Deakin University in external mode. Whilst procedures and requirements may have been defined in the contractual arrangements between the two institutions, these do not necessarily guarantee QA measures would satisfy accreditation requirements assessed under the previous model. As the new agreement involves the handover of the primary 'teaching' role for more than 50% of the program, Engineers Australia, as part of its standing procedures, reserves the right to conduct a full assessment of the licensed component of the program offered in Malaysia, using the same guidelines and procedures as would be applied to an Australian program.

Where a twinning arrangement grants advanced standing of 50% or less of a designated program, these standing procedures do not require independent evaluation of the initial feeder program by Engineers Australia. The focus is rather on the regulatory framework and quality processes which manage the granting of advanced standing credit by the host university. These circumstances applied to the earlier operating arrangement where KDU College diploma graduates articulated into the final two years of the Deakin University programs offered by external mode in Malaysia.

Regulatory frameworks applicable to accreditation of engineering programs

Engineers Australia accreditation role

Engineers Australia, as the national competency authority for the accreditation of professional engineering programs in Australia, engages with engineering schools within the Australian university sector to accredit four year (professional) and three year (sub-professional) engineering programs at the undergraduate level. Accreditation is undertaken on a 5-year cycle and conducted in accordance with the Accreditation Management System published by Engineers Australia. The Stage 1 National Generic Competency Standards, also published by Engineers Australia, is a key benchmark reference describing the expected capabilities and attributes of engineering graduates at each of three occupational levels. The Accreditation Criteria described in the Accreditation Management System collectively provide the fundamental metric for assessing the operating environment, the program design and the underpinning quality systems associated with an engineering education program and Proceedings of the 2007 AaeE Conference, Melbourne, Copyright © Selvalingam, S., Billings, R. & Booth, D., 2007

enable an evaluation panel to judge the likelihood of a graduate satisfying the Stage 1 competencies. Unlike in some other countries, Australia does not, at this time, require mandatory licensing of engineers in order for them to be able to practice. Across the country, some state jurisdictions do require registration of engineers so as to permit practice in defined industry areas (such as the building industry). Independent of its accreditation role, Engineers Australia operates the National Engineering Registration Board, which facilitates the admission of suitably qualified and experienced candidates to the National Professional Engineers Register (NPER).

Accreditation within Malaysia

In Malaysia, the Private Higher Educational Institutions Act 1996 controls the operation of non-government higher education institutions, ie 'Private Higher Education Institutions' (PHEIs). The Act normally requires such institutions to have approval from the MOHE on the advice of LAN (operating under the LAN Act) to conduct degree courses before they can commence. Australian universities offering undifferentiated engineering programs in Malaysia, whether as a Foreign Branch Campus University or under some form of twinning arrangement, must operate under this PHEI Act. This requirement certainly applies to programs offered by Deakin University through its partner organization KDU College. LAN advises and makes recommendations to the Minister of Higher Education for the approval of courses of study to be conducted by PHEIs, with regard to the suitability of arrangements relating to the educational facilities relevant to the courses of study, and the standards and quality assurance processes used to manage the courses of study.

For any education program under its control, LAN grants an 'approval' to conduct the program before it can commence. Approval must be obtained before the PHEI is allowed to enroll students and commence its courses of study. Six months before the first cohort of graduates appears, that is, when there are students at all levels of the program, it must go through a LAN accreditation process and be 'accredited' or at least reach 'minimum standards' or else it must be discontinued. Accreditation is required to grant awards. 'Minimum standards' is an accreditation outcome which allows further time to achieve accreditation. Accreditation is a formal recognition of the fact that the certificates, diplomas and degrees awarded by PHEIs are in accordance with the standards set by the LAN. Accreditation requires a visit by a panel of assessors to the PHEI to meet with students, lecturers and management, and to inspect laboratory and other infra-structure and facilities.

Accreditation of a new professional engineering program has several meanings within the Malaysian context: The first refers to the approval granted by LAN to continue to conduct programs and award degrees as detailed above; the second refers to the acceptance of the graduates from the programs as suitable for employment in the public service by the Public Services Department (JPA – Jabatan Perkhidmatan Awam, Malaysia); the third meaning refers to 'professional accreditation' or acceptance of the program as producing graduates suitable for registration as professional engineers. For engineering education programs this responsibility falls on the Board of Engineers, Malaysia (BEM).

The Public Service in Malaysia (JPA) will only employ engineers from programs which it has accepted or 'accredited'. This is another interpretation of the concept of accreditation in Malaysia and is quite separate from professional body accreditation. While JPA generally accepts programs accredited by LAN, it also evaluates programs from foreign countries. The practice of engineering is regulated by the Board of Engineers (BEM) in Malaysia and requires an engineer to be registered. This registration process is assisted if a graduate has completed an engineering education program that has been 'accredited' separately by the BEM. Here the meaning of accreditation is different from that used by LAN and reflects professional body accreditation as applies to the accreditation processes undertaken in Australia by Engineers Australia. The Institution of Engineers, Malaysia (IEM) is a professional society separate from the BEM though it has five representatives within it.

This combination of requirements means that for engineering courses seeking professional accreditation, all three bodies are involved, and are put together within the EAC (Engineering Accreditation Council). The EAC is the body delegated by BEM for accreditation of engineering degrees, and is made up of representatives from BEM, IEM, LAN and JPA. The EAC is responsible for the evaluation processes associated with accreditation and has developed an Accreditation Manual

which fully defines the criteria and requirements. The EAC is effectively implementing joint accreditation on behalf of the BEM, LAN and the JPA.

The initial application from a PHEI to conduct a new engineering program is submitted to EAC through LAN, but is subsequently forwarded to the EAC. The public institutions of higher learning apply for accreditation with EAC directly through the Institution of Engineers, Malaysia (IEM). For private institutions EAC first carries out the 'Initial Evaluation' of a program and makes the appropriate recommendations. If satisfactory, this will be followed sometime later by an application by PHEIs for the program to be considered for full accreditation by EAC. This application is required at least six months prior to the final year examination of the first intake of students.

The EAC process operates effectively, but complexities arise when an undifferentiated program is implemented by a foreign branch campus or by an Australian university in partnership with a local educational body. From the point of view of professional body accreditation, under these circumstances the program offering would have to satisfy both the EAC requirements as well as the accreditation criteria set by Engineers Australia. This conflict of rules has been recognized by the Malaysian Cabinet, which has decided that Foreign Branch Campus Universities should only have to satisfy one regulatory system in the original design of programs, and since they issue foreign awards, that should be the regulatory system in place in the country from which the program has originated. Curtin University of Technology, Monash University, Swinburne University of Technology and Nottingham University each operate Foreign Branch Campus Universities in Malaysia and have been granted simplified MOHE processes for attaining initial approval to implement an undifferentiated program in Malaysia. This process only eliminates the need to satisfy all the detailed LAN requirements and does not affect any requirement for professional accreditation by bodies such as the BEM. For programs offered through a partner body such as the Deakin/KDU College initiative, the full LAN approval processes must be pursued and attained.

Malaysia is in the process of revising its whole approach to the supervision and regulation of post-secondary education. A new comprehensive body, the Malaysian Qualifications Authority (MQA), is to be set up in the near future which will cover public and private universities and colleges as well as other lower-level technological institutions. The final form of these arrangements will not be certain until the legislation has been passed and operating processes and procedures are developed but it is clear that the MQA will subsume the operations of LAN and parts of the MOHE concerned with program arrangements in public universities. While MOHE and the Minister should maintain their current central role, MQA will ensure that all universities and colleges develop and introduce programs and quality assurance processes consistent with a new Malaysian Qualifications Framework (MQF). Currently, the MQA legislation does also provide for some institutions, on meeting certain requirements and after undergoing an institutional audit, to be given a form of self accreditation status which will simplify but not remove external processes. This will provide a means of accommodating, amongst other things, the sort of complexities experienced by Foreign Branch Campus Universities which were associated with trying to comply with incompatible requirements in two countries. In many ways LAN is already metamorphosing into an organization which will form a major part of MQA. Professional engineering programs which need professional (WA) accreditation will still also need to undergo the type of process now operating under the EAC. The EAC processes are recently developed and not expected to change but there could be some variations in the detail if MQA inputs to the EAC differ somewhat from those of LAN.

The Washington Accord

Engineers Australia is a foundation signatory to the Washington Accord agreement, first signed in 1989. The signatories have exchanged information and examined respective policies, processes and practices for granting accreditation to professional engineering programs and have agreed that these are comparable. This agreement ensures that the substantial equivalence of accredited engineering programs in signatory countries is communicated to bodies responsible for the registration or licensing of professional engineers in the particular country or territory, thus assisting the international mobility of professional engineers. The Washington Accord specifies the essential elements of an accreditation system as a pre-requisite for any accrediting body seeking provisional signatory status. The

Washington Accord network continues to identify and encourage best practice in the processes of accreditation and in the academic preparation of engineers for professional practice. The Washington Accord undertakes systematic monitoring of the accreditation policy, processes and practices of its signatories with a 6-year formal review cycle. The Engineers Australia accreditation system was reviewed by a Washington Accord monitoring team in 2002 and the current revision of the Accreditation Manual incorporates changes based on the recommendations made in the monitoring team's report.

A number of Australian educational institutions implement engineering education programs on both the home campus as well as at offshore locations through international partnerships or overseas campuses. Engineers Australia will consider for accreditation programs implemented by Australian universities at offshore locations, where the resulting degree is an award of the Australian University. Offshore offerings may well be alternative implementations of a host program already established on an educational provider's home campus and are thus undifferentiated in title, award and specified outcomes. Alternatively, such offerings may be quite separate to programs offered on the home campus, and are thus fully differentiated.

The Washington Accord in its rules and procedures now recognises accreditation of programs that are offered in differentiated or undifferentiated form by a provider, headquartered in the jurisdiction of a signatory, but delivered at a location outside of the national or territorial boundaries of that signatory. In all cases where a local accreditation body which is a signatory to the Accord exists, the accreditation body seeking to assess a program in that country must do so in collaboration with the local organisation.

Under the guidelines of the Washington Accord, signatories are able to accredit programs in other than their own countries under the following defined circumstances: Engineering Programs implemented without differentiation in two different countries, each with accrediting bodies who are full signatories to the Accord; Differentiated Engineering Programs offered within the country of a full signatory; Undifferentiated or Differentiated Engineering Programs offered within a non-Accord country.

In each case, the guidelines outline the extent to which the accrediting body (should such an authority exist) within the local country must be consulted and involved in the accreditation process. Since 2001, Engineers Australia has been undertaking accreditation visits to evaluate engineering education offerings by Australian universities at offshore locations. A requirement of the Washington Accord for the accreditation of programs offered by Australian universities in Malaysia is that Engineers Australia work with the BEM through the EAC to undertake professional accreditation of such programs on a collaborative basis. This applies for programs offered via the foreign branch campuses as well as through partnerships such as the Deakin/KDU arrangement. In this case, for Washington Accord recognition, a program must satisfy the accreditation criteria set by both the EAC and Engineers Australia.

Working relationship between Engineers Australia and EAC

The Board of Engineers, Malaysia (BEM) registers graduates and professional engineers under the Registration of Engineers Act 1967 (Revised 2002) of Malaysia. The prerequisite for registration as a graduate engineer is any qualification in engineering recognised by the Board. The formal recognition of the engineering programs conducted by any Institution of Higher Learning (IHL) including the PHEIs in Malaysia is carried out through the accreditation of these programs by the Engineering Accreditation Council (EAC), a body delegated by BEM for this purpose.

It is a requirement of Engineers Australia that the accreditation criteria must be satisfied by Australian universities for all modes and pathways by which a program can be completed including the implementation of a program at the offshore campuses or through offshore partnerships. Where a program is offered in Malaysia by an Australian university and where such a program is undifferentiated in title and content from an equivalent program offered on the home campus, then accreditation of the offshore offering will normally be ratified by Engineers Australia, but be conducted jointly or in collaboration with the EAC. Washington Accord guidelines require such program pathways to satisfy the accreditation criteria of Engineers Australia as well as the BEM.

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A cooperative working relationship between Engineers Australia and the EAC has facilitated such joint accreditation activity. Joint accreditation visits have already been conducted to evaluate undifferentiated programs offered at the foreign branch campuses of Curtin University of Technology and Swinburne University of Technology.

Meeting between AVCC project team and EAC/BEM

A meeting between the AVCC Project Team and the members of IEM, BEM, EAC and LAN was convened in November, 2006 at the BEM office in Kuala Lumpur. The objectives of the meeting were to understand the regulatory framework in Malaysia for accrediting partially or fully licensed engineering programs, and to explore common ground for the joint accreditation of such programs with Engineers Australia.

The following differences in the accreditation requirements between those of the EAC and Engineers Australia became apparent during discussions at the meeting:

- EAC requires that the PHEI seeks approval to conduct the engineering programs before they are launched. In the case of Engineers Australia, a provisional accreditation of a new program is undertaken during the first year of operation and is granted on the basis of compliance with the accreditation criteria to the extent then possible.
- Once students are enrolled into the program, the IHL is required to apply to EAC through LAN for the final accreditation at least 6 months before the final examination of the first intake of students (that is with students enrolled at all four year levels). Engineers Australia considers the program for full accreditation after the emergence of a substantial group of the first graduates.
- EAC does not require a campus visit for the approval to introduce a new program, while Engineers Australia will on most occasions require a campus visit for the consideration of provisional accreditation. Both EAC and Engineers Australia require a campus visit for the purpose of final accreditation evaluation.
- EAC does not accredit (3 + 0) engineering/technology programs, but accreditation is a requirement of LAN/MOHE and is carried out without the involvement of EAC. Engineers Australia does consider (3 + 0) programs such as B.Tech. for accreditation at the level of Engineering Technologist (sub-professionals).
- EAC believes that the upper limit of allowed credit transfer (advanced standing) for Malaysian diploma holders should be 30% of the study program. This rule is enforced particularly when the diploma study is of three years equivalent study and allows entry from SPM (O Level). Engineers Australia normally will accept articulation pathways with credit transfer (advanced standing) up to 50% on the basis of satisfactory evaluation of prior learning by the PHEI. If a particular articulation route exceeds the equivalent of 50% of the study period the designated prior learning feeder program would be subject to a separate accreditation process conducted by Engineers Australia.
- Engineers Australia accredits Australian university's engineering program implementation at both the home and offshore campuses, and for this purpose the engineering education provider is expected to submit for accreditation at each location with documentation that self evaluates the program offering against the accreditation criteria. The Malaysian partner of a licensed program must request the EAC to evaluate a program for accreditation and follow this request with submission documentation based on the format required by EAC. Engineers Australia and EAC, although both holding signatory/provisional signatory status with the Washington Accord, each have specific criteria and rules for accreditation.
- The EAC is somewhat more prescriptive in the setting of mandatory requirements, for example, credit hours distribution and academic staff strength. Engineers Australia provides quantitative guidelines in these cases, communicating expectations but not setting absolute minimums.

Issues arising in joint accreditation

The differences in the accreditation processes of Engineers Australia and the EAC identified above need to be resolved in order to facilitate joint accreditation visits to the Malaysian partner campuses. When the engineering program at the offshore location is argued to be undifferentiated from that at the home campus in Australia, the academic curriculum is by definition matched to that of the already accredited home-campus offering, irrespective of whether the program is partially or wholly licensed. From this viewpoint, the Engineers Australia criteria on academic program design will be satisfied. The focus of the Engineers Australia accreditation visit will thus be on aspects such as the operating environment and the quality systems. Specific delivery issues that will be of interest will be the quality and capability of the local academic teaching team, the leadership of this team and engagement with the processes of educational design, review and improvement, the moderation of assessment processes, the exposure students are receiving to professional engineering practice, the conduct and supervision of project activity, the level of engagement with local industry, the quantum and quality of practical and laboratory learning, the physical learning support resources, as well as the equivalence of integrating learning experiences such as problem solving, project work and engineering design.

From the EAC viewpoint, the undifferentiated aspect of the program offering is not of fundamental concern. The key objective is to evaluate the program offerings against the five key elements of the accreditation criteria set out in the published Engineering Program Accreditation Manual. In a similar sense, the EAC focuses on the academic program design, students, academic and support staff, facilities and quality management. In consideration of full accreditation, the EAC evaluation team will consider the structure and content of the academic program in full detail.

For the licensed delivery component both the EAC and Engineers Australia will be keenly interested in the qualifications, experience and performance of the local academic teaching team, and the effectiveness of the QA role of Deakin University staff. In the final phase of the program, where Deakin University takes control of external mode delivery, the focus of both bodies will be on the delivery role of Deakin University staff and the complementary support role of local staff. In this case, the coherence of the overall teaching team and the effectiveness of communication links between the Deakin home campus and KDU Malaysian campuses will be critically evaluated.

The emergence of the Malaysian Qualification Agency (MQA) and any changes this may bring to approval and accreditation processes will need to be tracked. MQA is currently holding discussions with various provisional bodies regarding the accreditation processes. Provisions are expected to be included within the MQA Bill (planned to be tabled through the Malaysian Parliament in 2007) to accommodate the fact that full responsibilities of accreditation rest under the provision of the professional bodies' framework.

Accreditation of fully or partially licensed engineering programs

In accordance with requirements and procedures laid out by Engineers Australia for Australian universities, accreditation of offshore programs has been linked to Australian offerings, and has operated with the understanding that the Australian university has full and complete control of the content, form, teaching and assessment processes and quality assurance of all stages of the offshore program. Offshore accreditation has involved accreditation panel visits to the local campuses, and wherever possible has been carried out in conjunction with local accreditation bodies, in accordance with the Washington Accord, requirements.

One of the possible options available for the Australian universities to deliver engineering education in Malaysia would be to license the entire degree program study materials to a partner organisation, most likely a PHEI. The program would normally be taught by qualified local staff associated with the partner organization, but could include input from staff of the Australian university by agreement. The Australian university would be expected to put in place appropriate moderation and QA mechanisms in order to ensure program outcomes match those achieved at the home campus. An arrangement of this nature would be referred to as a Fully Licensed Engineering Program. The award in such cases could be badged under the partner institution and in such a case would thus be classified as a

differentiated offering. In this case accreditation would primarily be the responsibility of the EAC. If the award was alternatively issued under the Australian university, then the offering may well be argued to be undifferentiated from the equivalent implemented on the home campus and in this case joint accreditation processes initiated through Australian signatory would be required. It should be noted that the undifferentiated programs run by the Australian Foreign Branch Campus Universities cannot be considered as a licensed implementation, since the campus, facilities, and teaching staff are fully run and managed by the Australian university.

A variation to the above option is for the Australian university to license only the initial part of the degree program, and retain control for delivery of the remainder. The testamur in this case would be issued by the Australian university and normally on an undifferentiated basis from host programs offered on the home campus. This option is possible for a Malaysian institution which has considerable strength of local academic and support staff, as well as the local facilities available. After the partial study of the program at the partner institution, the students would complete the degree either at the home campus of the Australian university, or by remaining in Malaysia and learning through an external delivery mode offered by the Australian university. In both cases the students are enrolled with the Australian university, and with identical content and assessment of the program, the learning outcomes are expected to be matched for the two situations. Alternatively this final component of the degree could be delivered at a Malaysian campus owned by the Australian university. An arrangement of this nature would be referred to as a partially licensed engineering program.

Deakin University is currently offering engineering programs in partnership with KDU College using a partially licensed model. Since the entire program is delivered at the offshore location, it is referred to as a (4 + 0) engineering program offered through twinning arrangements between Deakin University and KDU College. The programs are argued to be undifferentiated from the host programs offered at Deakin University's home-campus in Geelong, Australia. The graduates of the offshore and home campuses will hold identical testamurs. Based on Engineers Australia's accreditation criteria for a program offered at multiple locations without differentiation, it is necessary for Engineers Australia to initially consider provisional accreditation of the program in the early years of implementation.

Within Malaysia, KDU College is the partner institution offering Deakin's engineering programs under license and as a registered higher education provider in the country, it is required to meet the regulatory requirements of the Malaysian Government, in particular the Ministry of the Higher Education (MOHE). The initial application to conduct this program was submitted by KDU College to LAN and was evaluated by the EAC. Subsequently the program was launched in January 2006 after receiving an approval letter from MOHE to conduct these new courses at its campuses in Penang and Petaling Jaya. KDU College is further required to apply to LAN for the program to be considered for accreditation by EAC at least 6 months before the final examination of the first intake of students.

Under the guidelines of the Washington Accord, it is understood that any partially or wholly licensed engineering program, delivered on an undifferentiated basis is required to simultaneously satisfy the criteria stipulated by the Malaysian professional body (EAC) as well as the Engineers Australia. The EAC will evaluate the engineering programs based on submission of documents by the Malaysian partner at the appropriate time and normally requires a site visit. On the other hand Engineers Australia will normally visit the site on the request of the home-campus university for the purpose of coordinating provisional accreditation after the programs have been launched, and again after the first batch of graduates emerge, in order to consider the program for full accreditation.

Engineers Australia panel visited KDU in May, 2007 for provisional accreditation and a representative from EAC attended the proceedings as an observer.

Supplementary guidelines for the Engineers Australia Accreditation Management System

The following key elements have been specifically identified in this project as requiring critical attention in any evaluation process for programs implemented offshore on an undifferentiated basis and in accordance with a licensed or semi-licensed model by an Australian university. These elements

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identify specific aspects of the program implementation, including performance expectations and performance indicators, that need to be addressed alongside the standard accreditation criteria. Guidelines based on these key elements will be integrated as a supplement to the Engineers Australia Accreditation Management System document set, and will identify for the benefit of evaluation panels the key issues that must be considered. The material also provides for Australian universities a listing of key issues for consideration, along with performance expectations, and should be a valuable resource in establishing an offshore partnership for the delivery of undifferentiated programs implemented in accordance with a licensed or semi-licensed agreement.

Operating environment (physical facilities, academic, technical, and general staff):

- The learning resources accessible to students must be adequate and functionally equivalent to those on the Australian home campus. This must include library facilities and resource materials, computer access and computer based learning resources, laboratory facilities and equipment, project based learning facilities, workshops, collaborative learning and team based facilities.
- Communication linkages between campuses must provide sufficient capability and bandwidth such that required access to home campus teaching staff and resources provides equivalent learning support to that experienced by students enrolled in the host programs implemented on the home campus.
- There should be broad engagement with local industry at the offshore location for the purposes of securing advisory input to the processes of setting the educational outcomes specification, monitoring specific needs of the local engineering industry, linking with the home campus industry advisory body, and facilitating opportunities for broad exposure of students to professional engineering practice including student work placement.
- For delivery of the licensed segments under a semi-licensed arrangement, the selection criteria, development opportunities, leadership and performance management of local (offshore) teaching staff should be equivalent to that in place on the home campus. Trans-national linkages between teaching teams should facilitate input from staff of the licensing institution to the processes of educational design, review and continuing quality improvement of programs.
- For delivery of the non-licensed segments under a semi-licensed arrangement, the selection criteria, development, leadership and performance management of local (offshore) teaching staff should be integrated with that of the home campus teaching team to provide a unified and cohesive approach to the educational design, review and continuing quality improvement of programs.
- For an undifferentiated offshore program implementation, there must be a demonstrable engagement of teaching staff at the offshore location in the 'big-picture' program objectives and broad specification of targeted graduate outcomes as well as the processes of mapping and tracking the delivery of graduate outcomes through the learning experiences and assessment elements associated with individual academic study units.
- Technical Support Staff must provide levels of support which assure the equivalence of hands-on learning outcomes.
- General student support and administrative services at the offshore location should match the standards in place on the home campus.

Academic program delivery

- For both licensed and un-licensed delivery components in an undifferentiated offshore program implementation, the delivery, assessment and moderation arrangements must be such as to assure the equivalence of the following learning experiences with those that are in place for the already accredited home campus host offering: Capstone thesis/project, project activity and project management, team based learning activities, industrial training/work experience, broad systematic exposure of students to professional engineering practice, laboratory and practical learning, complex broad context problem solving, engineering design.
- Mechanisms should be in place for adapting curriculum to satisfy the needs of the local engineering environment, yet maintaining equivalence of overall educational outcomes.

Quality systems

- Specifically for the licensed delivery components, there must be systematic and rigorous processes in place to monitor delivery and moderate assessment standards, to demonstrate equivalence of learning to that in place on the home campus.
- In a trans-national sense there must be a demonstrable closure of the quality loop on a continuing basis. This should embrace delivery of targeted graduate outcomes at the overall program level as well as closing the loop on targeted learning outcomes, learning activities and assessment processes at the individual academic unit level.
- Engagement of the student body in the cycle of continuing quality improvement through feedback and other input mechanisms must cover both home campus and offshore students on an equitable basis.
- The quality system must fully engage all stakeholders, including the academic teaching team at both the home campus and offshore locations and provide appropriate trans-national linkages.

Conclusions

Among the variety of arrangements in which Australian universities conduct overseas engineering programs, the characteristics of partially or wholly licensed programs are examined from an accreditation perspective. The roles of Engineers Australia and the Engineering Accreditation Council, Malaysia in the accreditation processes and their responsibilities as the signatory countries of the Washington Accord are highlighted. A cooperative working relationship between Engineers Australia and the EAC has facilitated accreditation of programs offered by two Australian universities in Malaysia. However, differences in the accreditation processes of the two professional bodies exist and the need for their resolution is stressed to facilitate joint accreditation. Finally a set of supplementary guidelines for the Engineers Australia Accreditation Management System is suggested.

Online source

Engineers Australia Accreditation Board (2006): *Accreditation Management System*. Accessed at <http://www.engineersaustralia.org.au/> on (January 2007).

Engineering Accreditation Council (2006): *Engineering Programme Accreditation Manual*. Accessed at <http://www.bem.org.my/> on (January 2007).

Acknowledgements

This paper is based on a project made possible with funds provided by the Australian Vice-Chancellors Committee. Authors wish to acknowledge the valuable contributions and directions provided by the team member, Prof. Alan Bradley, Associate Director, Engineers Australia. Without his support, and help in coordinating with the Malaysian counterparts, the objectives of the project would not have been accomplished. Last, but not least the authors would like to thank Dr. Jeff Stewart for the time involved in the project in the form of making sense of our discussions and putting them together within the project reports at various stages.

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