

Conducting Assessment Workshop for Staff Development Program

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Abstract

Universiti Teknologi PETRONAS is a private university situated in Perak, Malaysia offers Engineering and Technology Programs. The faculty members are from the departments of Electrical and Electronics Engineering, Mechanical Engineering, Chemical Engineering, Civil Engineering, Petroleum Engineering, Computer and Information Sciences, and Management and Humanities. Regardless of their teaching experiences, newly recruited faculty members are required to participate in the Education Delivery and Assessment Workshop, organized by the Academic Central Services Department in collaboration with the Human Resource Department. Most of these new faculty members have undergone no formal teaching training and depend primarily on their past teaching experiences gained from previous institutions of higher learning they were affiliated with. But for those coming from the industries, it is a new experience altogether. Yet, these lecturers will be expected to teach at the start of the semester, and their performance in class is subjected to evaluation by the students whom they teach. What kind of education delivery and assessment methods preparation are in store for them? The Academic Central Services Department plays an important role in providing in-house training with the main objective of the training; to serve as a means of introducing the education delivery and assessment culture that meet the standards set by the university. It is made compulsory for all new faculty members of this university to undergo the Staff Development Program. This program also acts as a refresher course for a few lecturers whose evaluations have yet to meet the minimum standard measurement. The program is effectively an Education Delivery and Assessment workshop conducted by the university's trained facilitators who are senior faculty members with consistently good teaching track record, typically identified by the university. The objective of this paper is to share the experience of how the in-house assessment training session is conducted and the outcomes of the training. A pretest and a posttest are dispensed to measure if the learning outcomes of the workshop have been achieved. A questionnaire issued by the Human Resource Management Department is also used to obtain feedback from the workshop participants. The results obtained are encouraging and show that the training on assessment methods has given a promising impact.

Introduction

Most graduates who chose to become lecturers at institutions of higher learning, public or private, in Malaysia go through no formal teaching training like school teachers. For Universiti Teknologi PETRONAS (UTP), it is of no exception. Those newly recruited faculty members, whose entire work experiences had been in industries face a totally new challenge as they divert their working life towards becoming academic staff of UTP. Apart from research work, these faculty members are now part of the UTP teaching force that are expected to be effective in their education delivery as well as be able to construct appropriate and effective assessment methods in order to measure the respective course learning outcomes. What type of assistance in terms of assessment trainings are in store for them to at least be prepared to designing effective assessments that measures learning abilities? This will be certainly expected of an acceptable standard predetermined by the university. An organized assessment training is inevitable, to prepare the faculty for the kind of job scope. The training for these newly-recruited faculty members must accommodate and be conditioned to real-life situations. What would be an effective and acceptable training that is acceptable to a crowd of different backgrounds? What would measure the effectiveness of the training? How would a trainer know if learning amongst participants in the training actually takes place? The objectives of this paper are to provide a description of how the in-house training called Testing and Evaluation (T&E) Workshop is implemented in UTP to cater for the

needs of the newly recruited faculty members of this university, and to measure the effectiveness of the program from the participants' point of view. The organizers measure the workshop outcomes and discover how it is perceived by participants by employing a questionnaire issued by the UTP Human Resource Management (HRM) Department.

Background

The challenge of newly employed lecturers is to meet the expectations of being able to teach well and be capable of designing assessments to measure how much their students have learned. The designing of assessments calls for strategies. To discover those strategies, one needs some form of training. Institutions of higher learning in Malaysia are expected to provide such trainings to accommodate for such needs. The University of Queensland Staff Development Program (2008), for example has its own staff training designed to provide an essential foundation for scholarly teaching and learning practice with flexible structure, providing elective modules selected from a range of teaching and learning themes, and a completion capstone module. Anna University Chennai, India has its own Center for Faculty Development (2008) which conducts faculty development training programmes catering the needs of faculty members for the past 5 years. The Centre trains the teachers to plan and prepare the lessons, understand the subject contents and improve the teaching quality. These programmes are conducted during the summer or winter vacation by trainers who are experienced faculty members from the university and also experts from the industry and the number of participants are restricted to 20. UTP chooses to provide consistently two training sessions yearly that are participant-centered, Effective Education Delivery (for teaching) and another is called Testing and Evaluation, T&E (for assessment of student learning) Workshop. The objective of this paper is to deliberate on the latter. At the end of this T&E workshop, participants should be able to: 1) Apply concept of assessment and evaluation in OBE implementation of a course. 2) Plan the assessment and evaluation of learning outcomes within their courses. The T&E workshop is done in 5 sessions with related learning modules; 1) Accreditation requirements and OBE awareness, 2) learning theories and students' learning styles, 3) assessment and alternative assessment methods, 4) presentation of findings 5) evaluation and conclusion. Besides the locals, faculty members of UTP come from as far as England, United States of America, France, Sudan, Egypt, Syria, Iraq, Turkey, Russia, India, Pakistan, the Philippines and Indonesia. Some have had teaching experience from their previous institutions of higher learning of which they were affiliated to whilst some have had their experience of working entirely at industries of which giving lectures to students would be a totally new experience altogether. The teaching and assessing student learning experience gained by the new-to-UTP lecturers in their previous institutions of higher learning or universities most likely differ from the expectations of UTP. To ensure the expected skills in assessing students' learning for the student population on-campus are met, all newly recruited faculty members are required to participate in an in-house training exclusively designed for UTP academic staff.

The Education Technology and Development Unit (ETDU) is a service provider under the umbrella of the Academic Central Services (ACS) in collaboration with HRM Department of UTP is responsible in providing training for the academic staff development. This is also to ensure that the faculty of UTP is provided with the appropriate training programs aimed at providing quality education, one of which is the T&E workshop; effectively a course on assessment methods. The objectives of such training included a comprehensive coverage; from the awareness of the outcome-based education, accreditation engineering and technology accreditation requirements set by the various accreditation bodies; local and abroad, awareness of students' learning styles, to the various assessment techniques in measuring students' learning. The various accreditation bodies concerned include the Engineering Accreditation Council (EAC) for the engineering programs, Malaysian Qualifications Agency (MQA) for the Technology and Foundation Programs as well as the Washington Accord and the international accreditation bodies for the different engineering and technology programs. Initially, trainers for such workshops had been invited from out-of campus and the programs were conducted at locations away from the university. As the university grows, the faculty grows larger with the increase in student number; the need for staff training consequently becomes more demanding and costly. With the increasing number of students and staff, the university now has a newly built state-of-the-art academic building with facilities, including several seminar rooms on-campus fit for short-course trainings. For academic staff development trainings, ETDU is made responsible for logistics that include printing, compiling and binding of training materials for the participants' use and convenience intended for the smooth-running of the program. The

number of participants is normally capped at 25. Each participant is provided with a complete set of materials used throughout the workshop including samples of past final year examination papers. A suitable venue for the training is as important since participants are required to focus their attention on the training with the minimum of disturbances from the mundane office duties. This workshop provides a complete one-day meal; morning tea, lunch, and an afternoon tea with water and confectionery available all day.

The author, a senior faculty member, with 27 years of teaching experience in public and private colleges and universities in Malaysia, has delivered public talks to parents and students in local public schools. A UTP faculty member since year 2000, she is a professionally-trained facilitator, who has conducted various in-house trainings in UTP, facilitated motivational camps for UTP under-performing students and has trained newly-recruited UTP faculty members in Effective Education Delivery, T&E workshops since 2002. The author, cum facilitator for the proposed workshop, is with the approval of the UTP Academic Committee. She prepares and compiles materials for the workshop and determines the workshop itinerary based on the objectives of the T&E workshop. Early preparations before the workshop include preliminary discussions and coordination between the facilitator and ETDU. This is crucial in ensuring the smooth-running and the success of the program in achieving its objectives. The author's tasks are (amongst others) to facilitate rather than teach, encourage, motivate and/or initiate participation in discussions. The intended training program is planned to be interactive and sharing approach. The participants sitting arrangement and appropriate set-up for the session is designed to best meet the objectives of the workshop. U-shape sitting arrangement is chosen to ensure that each participant has an equal opportunity of interacting with others by facing all other participants. Prior to attending the workshop, participants are clearly informed of the main objectives of the intended assessment workshop, the document (course syllabus) of which they need to bring along for the workshop, list of participants and the program itinerary via e-mailing. The syllabus in particular will be useful for the workshop as participants will need to refer to what are the learning outcomes of the courses that they will be teaching and how those expected abilities will be measured.

Methodology

Participants

21 participants from various departments, the program itinerary, venue and facilitator intended for the workshop come with the approval of the academic committee. The participants are all newly recruited faculty members from various engineering departments; Mechanical, Civil, Chemical, Electrical and Electronic, and Petroleum as well as faculty members from Computer and Information Sciences Department and the Management and Humanities Department. Regardless of background, all participants are required to attend a one-day T&E workshop. Some participants are fresh from universities with Masters Degree and no teaching experience; some are lecturers and professors with varied teaching experience, whilst others are fresh from the industries, with no teaching experience.

Instruments

A 10-minute pre test, prepared by the facilitator is first prescribed to measure level of existing knowledge that participants have with them pertaining to outcome-based education and assessment methods. At the end of the day, the same test (post test) is prescribed to measure how much the participants had learnt from the workshop. The tests scores are recorded and both tests are returned to participants at the end of the workshop. Statistical Package for Social Sciences or SPSS is used to analyze the data obtained for the tests. At the end of the workshop, a questionnaire from the HRM Department is dispensed to obtain participants' feedback pertaining to the effectiveness of the workshop. Instruments used to measure the expected workshop outcomes are as indicated in Table 1 that follows:

Table 1: Instruments Used To Measure Workshop Outcomes

NO.	WORKSHOP OUTCOMES	INSTRUMENTS
1	Acquire information on OBE, students' learning styles, effective assessment methods, designing appropriate test/exam questions to measure students' learning.	test

2	Participants' abilities (psychomotor and affective skills)	presentation
3	Workshop evaluation	questionnaire

Procedure

The T&E workshop is held on January 12, 2008, during a semester break, before the start of a new semester. It comprises five sessions; introduction that includes opening of the workshop, accreditation and OBE issues and requirements, learning theories and students learning styles, assessment methods, presentation and lastly conclusion which includes evaluation and closing of the workshop. The timing for each session is planned and monitored by ETDU staff to maximize the one-day program. The entire workshop is captured on video by the technicians from the Information and Technology Media Services (ITMS) of UTP for future reference. A pre test is dispensed and participants are given only 10 minutes to do the test. ETDU staffs collect the completed test and immediately evaluate and give the scores according to solutions readily provided by the author. The facilitator makes a brief introduction of herself, quick review of the workshop itinerary aimed at giving the participants an idea of the entire program. The outcomes of the five-session workshop are explained clearly, to ensure that the participants are well aware of the reason for the workshop. This is particularly important as it requires participants' full participation and contribution. Each participant is encouraged to put up a label on his/her table indicating what he/she would like others to address him/her throughout the workshop.

Session I: Introduction. The workshop starts off with an ice-breaking session, to informally introduce participants amongst themselves. The objective of this session is for participants to be familiar with the people they will be working with in the workshop. The author chooses the "buddy-system" to get each participant to introduce his/her "buddy". Next, a power point presentation is used by the facilitator who aims to create awareness of the accreditation minimum standard requirements with accreditation issues and demands. Requirements of EAC Malaysia, MQA, the respective international accreditation bodies and Washington Accord are also provided. The briefing includes expectations of EAC during an accreditation visit, appropriate documentation preparations; the university vision and mission, how the course learning outcomes are designed to support the program learning outcomes and how the program learning outcomes are linked with the university objectives, appropriate measuring instruments used for measuring student learning, various approaches of course delivery, assessments and evaluation. At the same time, participants are exposed to outcome-based education or OBE awareness, which has been a practice in UTP since 1997. This overview is to provide the global view of the university expectation in its attempt to providing quality education.

Session II: Learning Theories and styles. Learning theories, such as those by Piaget, Bloom, Bruner, Glasersfeld, and Vygotsky are discussed. Here in this session the facilitator shares some useful information on the various learning styles that students have and research findings that indicate what most students have as their learning styles. Felder's (2008) Index of Learning Style or the ILS is mainly used here in this session. The Taxonomy of Educational Objectives, B.S Bloom Editor (1956) is used to show the three learning domains, and the different levels of skills in each domain; from the lower order, to the higher order. Brain works, an instrument presented by Synergistic Learning Incorporated is used briefly to show one's brain usage profile; strong auditory or visual learner, left or right-hemisphere dominant.

Session III: Assessment methods. Bloom's Taxonomy (1956) is valuable in giving the participants a good basic idea of how learning outcomes are designed and hence the different levels of students' skills and abilities that are to be measured. Different types of assessment techniques are discussed; direct and indirect assessment approaches with respect to the various learning outcomes. Assessment methods discussed included the traditional and alternatives that measure students knowledge, skills and abilities in the three learning domains; cognitive, psychomotor and affective. Some existing examples of alternative assessments in UTP such as Professional Communication Skills (PCS), Engineering Team Project (ETP) and Engineering Design Exhibition (EDX) are also used as illustration of examples to participants. Samples of past final examination papers provided to each participant are referred to during this session as a guide in preparation of questions. Table 2 below describes some of the examples of assessment methods used for various course learning outcomes.

Table 2: Assessment Methods

NO.	LEARNING OUTCOMES	EXAMPLES OF ASSESSMENT METHODS
1	Ability to analyze...	Report writing
2	Ability to describe and evaluate...	Site visits
3	Ability to apply and solve ...	Tests
4	Ability to demonstrate.....	Presentation
5	Ability to explain/communicate....	Interview
6	Ability to construct....	Project
7	Ability to organize/design/reflect....	Course Learning Portfolio

Session IV: Presentation. Participants work collaboratively to propose appropriate assessment methods to measure the stated learning outcomes for the respective courses. Participants are given 30 minutes to work in groups of two or three after which they need to do a five-minute group presentation either by using an overhead projector or power point presentation. Each presentation is subjected to deliberation. Any amendments and suggestions to improve the assessment approach are open to comments and discussion. Each group uses altogether about 15 minutes.

Session V: Conclusion. A 10-minute post test is employed to once again measure the level of achievement of participants after they went through the short course. A questionnaire issued by the HRM Department is then distributed to obtain feedback from the participants to evaluate the T&E training program. The responses are based on the scale of 1 through 5 indicating poor to excellent rating, respectively. The facilitator wraps up the program by doing a short summary and concludes session by giving each participant a couple of minutes to reflect upon their learning experience and allow participants the opportunity to suggest areas of improvement.

Results

The pre test and post test scores are recorded and using the paired sample t-test, it is found that with significance level $\alpha=0.05$, the mean difference of the two tests is significant (0.00). It is noted that participants are all able to present their proposed assessment approach in measuring an intended learning outcome of a course. The ability to give comments and provision of suggestions for improvements during the presentation is also observed. Comments for improvement noted are that the participants enjoyed the construction of exam questions in a group and for improvement, the participants want to learn more on learning portfolios. The responses to the questionnaire issued by the HRM Department are as shown in Table 3.

Table 3: Feedback from Participants on T&E Workshop Evaluation

		Average rating score
A	The Objective of the course is clear	4.18
B	Activities in the course	4.03
C	The content of the course	3.95
D	Practical & Oral training in the course	3.75
E	Audio Visual facilities used in the course	3.78
F	The test in the course relates (to the job)	4.35
G	The course Introduces new areas to me	3.8

H	The knowledge acquired in this course	4.25
	Total score	32.09
	Average score (1= poor, 5 = excellent)	4.01

In terms of measuring the effectiveness of the facilitation and the running of the workshop, the average score rated by the participants of the T&E workshop is 4.01 on a maximum scale of 5. Table 4 that follows reflects a work sample of one of the groups.

Table 4: Work Sample - Learning Outcomes for Heat Integration course

CAB 4313, 4th Year Elective Of Chemical Engineering Undergraduate Program		
Course Outcome	Method of Assessment	Assessment Question (to be posed to students)
Identify a cost effective strategy to improve energy efficiency in the process plant using the pinch technology concept	For a shorter assessment structure, use in-class exercises or quizzes For a longer assessment structure, use assignments or a mini project	Given the configuration of a heat exchanger network system in a chemical process plant: (a) analyze the given system for its energy consumption (level of cognitive domain: analysis) [5 marks]; (b) propose and design a cost-effective strategy to improve the energy consumption in the plant using the pinch technology concept (level of cognitive domain: synthesis) [10 marks]; (c) evaluate the proposed strategy based on the following performance indicators of an optimal heat exchanger network: 1. cost of utility [3 marks], 2. number of heat exchanger units [3 marks], 3. area of heat exchange [3 marks]. (level of cognitive domain: evaluation)
Participant group leader: Mr. Khor Cheng Seong, Chemical Engineering Department, UTP		

Discussion

The objectives of this paper are to provide a description of how the in-house training called T&E Workshop is implemented in UTP to cater for the needs of the new faculty members of UTP, and to share the experience of conducting such workshops. It is observed that participants have shown their abilities in constructing exam questions that measure the intended learning outcomes. On a scale of 1 (poor) to 5 (excellent), the mean rating score of 4.01 out of 5.00 that is obtained is certainly encouraging and motivating for the participants, facilitator and the organizer. The collaboration-based presentation is particularly well accepted by the participants for such workshop activities. Table 2 shows that the participants are contented with the test given in the workshop best 4.35 out of 5, and least preferred practical and oral training 3.75 out of 5. A quick verbal suggestion is that there should be more time allocated for presentation of the assessment approaches. Similar evaluation ratings have been obtained in the previous T&E workshops that had been conducted in the past. On the whole, the facilitator finds that participants are actively involved in the sessions held, particularly during the preparation and presentations of the assessment methods to measure the respective course learning outcomes. They feel comfortable expressing their views and able to accept criticisms for the sake of learning. The results of the tests indicate a significant improvement in the participants' knowledge on OBE, students' learning and assessment approaches. With 95% confidence level, the analysis of the mean differences is significant, thus it is reasonable to conclude that the workshop conducted is successful in achieving its objectives. The challenge in organizing such training is to ensure that all newly recruited faculties are catered for before the start of the semester.

Conclusion

The newly-recruited and inexperienced faculty may regard the training as something they are immensely looking forward to, whilst the veteran may regard the training as an opportunity for them to learn a different approach to assessing students learning, at the same time share their own experience, which in turn provide useful inputs to the trainers as well. Due to space constraints, only one example of participants can be shown. In general, participants

prefer various ways of testing their students with a blend of traditional as well as alternative assessment methods, whilst keeping close to the course learning outcomes.

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