

## EVALUATION OF MASTER'S PROJECT COURSE LEARNING OUTCOMES AT OPEN UNIVERSITY OF MALAYSIA

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### ABSTRACT

*Learning outcomes are statements on what learners should know, understand and be able to do upon successful completion of a course. Achievement of learning outcomes is an important criterion for a programme to be accredited by the Malaysian Qualifications Agency. Evidence from teaching and learning evaluation needs to demonstrate that the learning outcomes have been achieved. The purpose of this study is to evaluate the learning outcomes of a final year master's project according to the course learning outcomes and learning domains determined by the Malaysian Qualifications Agency. This evaluation is carried out by analysing the feedback provided by supervisors and learners. The survey which was administered for postgraduate learners in the academic session of 2018, measured to what extent the completion of the course met the learning outcomes and fulfilled the learning domain skills stipulated. To strengthen the evidence, the results obtained from the master's project report awarded by supervisors and reviewers were compared according to chapters, programme and learning outcomes. The findings were discussed to highlight concerns, strengths and weaknesses based on the evaluation. Several recommendations for continuous improvement and support were proposed to improve the quality of the course and achievement of the learning outcomes.*

**Keywords:** *Course learning outcomes, Master's project, Postgraduate learners, Distance education, Learning Domain*

### INTRODUCTION

The achievement of learning outcomes should be constantly evaluated for the purpose of continuous improvement. This process will ensure that graduates are duly qualified and meet the criteria set by their department and university. The achievement of learning outcomes can be evaluated through problem-based learning, final project, final examinations and industrial training.

The master's final project showcases the knowledge acquired by a learner throughout the duration of the course undertaken. A course which needs to be independently undertaken goes beyond requiring a learner to just remember facts and promotes higher forms of thinking such as evaluating concepts, principles, processes and procedures; performing case studies; producing project reports; and making presentations. The successful completion of the course is crucial to demonstrate a learner's ability to grasp wide a range of knowledge and skills learnt during the programme, ability to research an intellectual problem,

and write a report. The most crucial aspect is that the course should fulfil all the evaluation components determined by the Malaysian Qualifications Agency (MQA).

The current study seeks to evaluate the learning outcomes of a master's final project according to the course learning outcomes and learning domains set by the MQA through reflection, self-assessment using a survey, and direct assessment based on the marks awarded. The aim of this study is to contribute to the quality of the course in distance learning and improve the achievement of the learning outcomes stipulated.

## LITERATURE REVIEW

As part of fulfilment of graduation requirements for master's degree, learners in the Cluster of Applied Sciences (CAS), Open University Malaysia, need to undertake a course for which they must carry out a final year master's project (MP) independently over two semesters or eight months in their last year of study. The course objectives are to demonstrate the wide range of skills acquired by producing a report which conforms to the agreed cluster standards, to produce multidisciplinary research through the integration of materials learned in several courses, and to demonstrate problem-solving and report-writing skills. The project report needs to be structured according to five chapters, which are introduction, literature review, methodology, findings, and discussion and conclusion. The course carries a 15 percent weightage for the overall postgraduate programme.

A learning outcome is a statement which refers to the actions a student performs and uses the action verb to describe the course outcome (Larson, 2017). The learning outcomes in the MP course is to clearly highlight the importance of what the student should be able to do, know or value upon successful completion of the course. It is the primary documentation in the implementation of any academic programme. In addition, the course learning outcomes (CLOs), programme learning outcome, and assessment criteria are included as guidelines. The MP course is offered throughout the postgraduate programme in the cluster with almost the same structure of course contents with differences in the implementation fields. As such, a common set of CLOs was established to be relevant for all CAS programmes to ensure standardisation of monitoring and assessment.

The CLOs should be measurable and observable via cognitive, psychomotor and affective learning domains. They should reflect essential knowledge, skills and attitudes and represent the minimum performance which must be achieved to successfully complete a course. Thus, the CLOs need to be aligned with the learning domains. Learning domains, or also referred to as learning outcome domains, may be thought of as learning categories. There are three domains of learning: first, the cognitive domain involves knowledge and the development of intellectual skills (Anderson, Krathwohl et al., 2001). This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills.

Affective learning focuses on growth in feelings, values, appreciation, motivation and attitudes (Krathwohl, Bloom et al., 1956). Krathwohl et al. (1956) describe five levels of internalisation, which are receiving, responding, valuing, organising, and characterisation by a value complex. As a value moves up these levels, it is considered to be more internalised. Savickiene (2010) highlights that teaching and learning which focus on the affective domain must be taken seriously in the evaluation process as the ongoing economic restructuring, globalisation and development of technologies require specific attitudes and values towards contemporary changes. Meanwhile, the third learning domain is psychomotor skills. This would include physical movement, coordination and use of motor-skill areas. These might focus on speed and efficiency, precision, procedures or techniques in execution (Dave, 1970).

The learning domain is considered in the evaluation so that the skill development required in the programme offered is addressed. The skills identified are knowledge and understanding skill, cognitive skill, practical skill, interpersonal skill, communication skills, digital skills, numeracy skill, leadership skill, personal and entrepreneurial skill, ethics and professionalism. The formation of the skills used in this study has been defined according to the Malaysian Qualification Framework's second edition document. The MQF was established to illustrate all levels of higher education in Malaysia and serve as a national reference point for all Malaysian qualifications. This document was prepared by MQA which is the main quality assurance and accrediting body and has the responsibility of assuring the quality of both public and private higher education programmes in Malaysia. Table 1 indicates the mapping of the CLOs with the learning domains and course components.

Table 1: Mapping the CLO, Learning Domains and course components

<b>Course Learning Outcomes (CLO)</b>	<b>Learning Domain</b>	<b>Course Components</b>
CLO1. Develop research problem and objectives in the relevant field	Knowledge and understanding skill Personal and entrepreneurial skill	Chapter 1 - Introduction <ul style="list-style-type: none"> <li>• Research Background Problem Statement</li> <li>• Research Objectives</li> <li>• Research Questions/ (Hypotheses)</li> <li>• Significance of the Research</li> </ul>
CLO2. Review related literature using appropriate resources in the relevant field	Interpersonal skill, Cognitive skill	Chapter 2 - Literature Review <ul style="list-style-type: none"> <li>• Theoretical Framework</li> <li>• Conceptual Framework</li> </ul>
CLO3. Design appropriate research methods to address stated objectives	Leadership skill, Practical skill	Chapter 3 - Methodology <ul style="list-style-type: none"> <li>• Research Design</li> <li>• Data Collection Method</li> <li>• Data Analysis Method</li> </ul>
CLO4. Discuss the research findings based on collected data	Digital skills, Numeracy skill	Chapter 4 Data Analysis and Result Chapter 5 Discussion and Conclusion
CLO5. Conduct the research with good communication, creative, ethical, professional and independent throughout the study	Communication skills Ethics and Professionalism	Oral Presentation <ul style="list-style-type: none"> <li>• Verbal</li> <li>• Non-verbal</li> </ul>

## RESEARCH METHOD

The aim of this study is to evaluate the MP course's learning outcomes. The evaluation is carried out through survey feedback from the supervisors and learners as well as the marks awarded through the final report and oral presentation assessed by the supervisors and reviewers. The survey was administered to 48 postgraduate learners at CAS, who have successfully completed and submitted their final year master's project in the academic session of 2018. The survey is limited to those who have written their final project report successfully and does not include those who are in the early stage of the course.

The survey instrument is divided into four parts. Part I refers to the demographic characteristics of learners, part II relates to skill performance based on MQA's guideline using five-point Likert Scale, part III reflect on the course learning outcomes using five-point Likert Scale and the last part include open-ended questions related to learning experience and challenges that the learners encounter while working on the master's project.

This survey feedback was also circulated to the supervisors, who were required to evaluate their learner's in terms of their capacity to meet the course learning outcomes and learning domains as well as provide other relevant information such as supervision challenges and suggestions for further improvement of the course. All participants were assured of the confidentiality of their responses. The survey results were analysed through descriptive statistics and thematic analysis. The marks awarded for the final report and final oral presentation by the supervisors and reviewers as direct assessment were included to provide real values of the course achievements.

## **RESULTS AND DISCUSSION**

The findings of this paper are discussed in relation to the survey instrument filled by learners and supervisors and the scoring marks given through the MP report and oral presentation by supervisors and reviewers. The first section highlights the findings of the survey and the latter describes the findings based on the marks awarded.

### **Survey Perception**

The survey findings from the learners' perspectives are presented in four sections, namely, participants' characteristics, learning outcomes, learning domains and final year project learning experience.

### **Characteristic of Participants**

A total of 48 participants responded to six demographic questions on gender, age, academic programme, sector, working experience and employment status.

Based on the descriptive data in Table 2, it indicates that the majority of the participants successfully submitted their MP project. They were enrolled in the Master of Occupational Safety and Health Risk Management (MOSHRM) (54%), Master of Project Management (MPM) (21%), Master of Quality Management (MQM) (15%), Master of Facility Management (MFM) (2%), Master of Information Technology (MIT) (6%), and Master of Environmental Sustainability Management (MESM) (2%) programmes.

The learners who completed the Master's Project in three semesters in 2018 were 77% male and 23% female. Their ages ranged from less than 30 (6%), 31-39 (46%) and 40-49 (33%) to more than 50 (15%). Private sector employees made up 79% while the rest worked for the government and in government link companies. The results indicate that the majority of the learners have working experience of more than 16 years (37.5%), 11 to 15 years (37.5%), 6 to 10 years (15%) and less than 5 years (10%) in the areas of oil and gas, manufacturing, information technology, construction and medicine. Most of the postgraduate learners hold the management positions in their respective fields.

Table 2: Demographics of Participants

<i>Variable</i>	<i>Description</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Gender	Male	37	77.1
	Female	11	22.9
Age	<=30years	3	6.3
	31-39years	22	45.8
	40-49years	16	33.3
	>=50years	7	14.6
	Academic Programme	26	54.2
Sector	MOSHRM		
	MPM	10	20.8
	MQM	7	14.6
	MFM	1	2.1
	MIT	3	6.3
	MESM	1	2.1
	Private	38	79.2
	Government	5	10.4
	GLC	5	10.4
	Working Experience	<=5 years	5
6-10 years		7	14.6
11-15 years		18	37.5
>=16 years		18	37.5
Employment status	Employed	41	85.4
	Self	4	8.3
	Employed		
	Unemployed	3	6.3

**Course Learning Outcomes (CLOs)**

Findings on CLO achievement from the six programmes offered by the cluster are presented in Table 3. It is interesting to note that the achievement perception of the supervisor is higher compared to that of the learners. This indicates that the supervisor perceived the learners as being competent to conduct the master's project. One factor that contributes to the supervisor's high perception is the adult learners' background, as they had from the experience and communication skill gained through their line of work.

Based on the learners' perspective of the course learning outcomes, they scored the highest means for designing appropriate research methods (CLO3) and discussing findings (CLO4). These were followed by their good communication, creativity, ethical and professional conduct and independence throughout the study (CLO5), literature review (CLO2) and development of research problem and objectives (CLO1). The lowest mean value is from CLO1 which requires learners to formulate research problems, objectives, question or hypotheses in the first chapter of the report. This is a typical problem for any learner especially in a distance education setting. To kick-start the project will be always the hardest for learners but once they are able to grasp the idea, they will get better in writing. However, further improvement is needed to increase the mean value of a CLO from the learners' perspective to be at least on par with their supervisor's perception or higher.

Table 3: Course Learning Outcomes

<b>Course Learning Outcomes (CLOs)</b>	<b>Learner's Feedback Mean</b>	<b>Learner's Standard Deviation</b>	<b>Supervisor's Feedback Mean</b>	<b>Supervisor's Standard Deviation</b>
CLO1. Develop research problem and objectives in the relevant field	3.88	0.489	4.09	0.668
CLO2. Review related literature using appropriate resources in the relevant field	3.90	0.592	3.97	0.717
CLO3. Design appropriate research methods to address stated objectives	3.94	0.561	3.85	0.610
CLO4. Discuss the research findings based on collected data	3.94	0.561	4.12	0.640
CLO5. Conduct the research with good communication, creativity, ethical and professional conduct and independence throughout the study	3.92	0.613	4.21	0.641

### Learning Domains

The learning domains as shown in Table 4 are considered in the evaluation so that the skills required in the MP course are addressed. Overall, the achievement of learning domains is higher compared to CLO achievement. Similarly, achievement of learning domains perception by the supervisors is higher compared to that of the learners themselves. This indicates that the supervisors perceived their supervised learners as having adequate skills to undertake the MP course. The highest skill score with a mean value of 4.47 was given by the supervisors to ethics and professionalism. This finding is in agreement with the learners' perception which also gave the highest mean value of 4.23 to ethics and professionalism. These similarities can be due to the fact that adult learners are more exposed to corporate standards of behaviour and are expected to be more professional and ethical. Meanwhile, the lowest mean value that is consistent between supervisors (3.94) and learners (3.83) is on the numeracy skill. This may be due to the difficulty experienced by learners in analysing and interpreting their collected project data.

Table 4: Learning Domain Skills

<b>Skills</b>	<b>Learner's Feedback (Mean)</b>	<b>Learner's Standard Deviation</b>	<b>Supervisor's Feedback (Mean)</b>	<b>Supervisor's Standard Deviation</b>
Knowledge and understanding skill	4.06	0.480	4.18	0.626
Cognitive skill	4.00	0.546	4.09	0.621
Practical skill	3.98	0.601	4.06	0.694
Interpersonal skill	4.10	0.592	4.38	0.604
Communication skill	4.13	0.606	4.29	0.676
Digital skill	3.98	0.601	4.18	0.673
Numeracy skill	3.83	0.519	3.94	0.694
Leadership skill	4.06	0.598	4.24	0.654
Personal and entrepreneurial skill	3.98	0.565	4.18	0.521
Ethics and professionalism	4.23	0.592	4.47	0.507

## **Learning Experience and Challenges**

In the responses to the open-ended survey, all the participants reported positive views, stating that working on the MP course exposed them to the experience of conducting research and writing academically, while enhancing their critical thinking and problem-solving skills. They highlighted several challenges encountered while working on the MP. Among the concerns raised were the time constraints of working while learning, difficulty in producing academic writing particularly in the formulation of research problems, writing the literature review and interpreting collected data. Other concerns were the need to master statistical software for data analysis and trying to finish the course within the time frame given.

Responding to the challenges encountered while supervising learners working on their MP course, the supervisors raised concern on the delay of completion due to reasons such as limited time, work commitments and research writing skills. Time limitation appeared to be the most common reason since all the learners are working adults.

## **Suggestion for Improvement**

Overall, the learners indicated the need for continuous project writing workshops such as on statistical analysis and literature review writing. They also requested administrative support for smooth operations. The same issues were also highlighted by the supervisors such as the need for continuous workshops on research methods, data analysis and research writing. Other concerns raised were such as the need for formal introduction sessions by the cluster to establish a link for the research work between potential supervisors and learners. In addition, a briefing session a semester ahead before the actual registration in the MP course were highly recommended for awareness, guidelines and the research area to be explored. Strict monitoring also can be helpful to assist learners in finishing the MP within schedule while establishing good communication with their supervisor. It is hoped that these suggestions can significantly influence the quality of the MP course for its success.

## **Scoring Marks**

The real value of CLO achievement is best represented through the marks awarded. Thus, a detailed breakdown between the chapters in the MP report, programme and marks awarded by the supervisors and reviewers are highlighted in Table 5 below.

In the perspective of supervisors, the finding indicates that the lowest scoring mark across chapters is from Chapter 1 with 69.6 percentage in the MESM programme. However, this finding cannot be concluded for all the listed programmes due to MESM having only one learner who submitted the report. The same goes for the second lowest score from the MFM programme, with only one learner submitting the report too. Even though this is the case, Chapter 1 still represents the lowest scored marks from the MOSHRM and MQM programmes. This finding is aligned with Table 3 on the learner's feedback survey where the first CLO measured in Chapter 1 is the lowest achievement. The highest marks perceived by the supervisor is on Chapter 3 with 87.5 percentage in the MIT programme. This finding is as expected for the MIT programme, as the research methods in Chapter 3 were focused on system designing and development method. If students fail to know the method, they will have difficulty in developing the system. Meanwhile, for the rest of the programme, the research method is very much based on the survey and interview approach.

Table 5: Master's Project Scoring Marks from Supervisor (SV) and Reviewer (RW)

Programme	Descriptive Statistics – Scoring Marks								Oral Presentation RW
	Chapter 1		Chapter 2		Chapter 3		Chapter 4 & 5		
	SV	RW	SV	RW	SV	RW	SV	RW	
<b>MOSHRM</b>	74.68	68.26	77.71	51.07	77.96	63.11	75.25	63.00	63.84
<b>MPM</b>	80.35	69.50	78.09	64.60	76.26	74.00	76.84	67.67	76.00
<b>MQM</b>	75.44	60.00	82.17	66.71	82.12	62.91	75.52	67.67	64.28
<b>MFM</b>	74.00	70.00	75.00	60.00	75.00	66.70	71.00	60.00	50.00
<b>MIT</b>	82.63	78.33	77.16	53.33	87.50	73.23	77.66	71.23	75.00
<b>MESM</b>	69.60	75.00	75.00	40.00	75.00	40.00	73.00	57.00	50.00

Since MESM cannot be concluded to represent all the programme due to only one learner participating, in the perspective of the reviewer, the lowest scoring marks awarded is in Chapter 2 with 51.1% for the MOSHRM programme. This is due to inability of the learners to identify and analyse research literature. Evaluation of Chapter 2 consists of literature review assessment by focusing on the learners' ability to orderly organise ideas, analyse previous studies and critically provide comments on the literature. The lowest scoring mark for Chapter 2 indicated room for improvement in the MP report to increase the capacity of doing literature review. The highest scoring mark perceived by the reviewer is on Chapter 1 with 78.3% for the MIT programme. This is justifiable as learners who are proposing improvements to the existing system for their MP course find it much easier to define the background, problem and objectives as they are very familiar with the system usage compared to other learners who need to do research and review new areas of studies.

Meanwhile, marks on oral presentation in the last column are based on verbal (clarity, conciseness, pronunciation, grammatical structure) and non-verbal (eye contact, posture, tone, gesture, appearance) cues. The results of this study indicates that the lowest scoring marks are from MFM and MESM. As highlighted earlier, only one learner submitted the report for each of the programmes, thus, scoring data from MOSHRM programme with 63.84 percentage is preferred to represent this assessment. In general, the scoring marks of oral presentation passed 50% of the passing rate, however, it is still below 80% for grade A marks. This finding may be viewed as room for improvement to further increase the oral presentation skill among learners.

Another interesting finding to note is the big difference between the marks awarded by supervisors and reviewers. This contradictory result may be because supervisors are more lenient in awarding marks, as they have supervised their learners for several semesters. Meanwhile, the reviewers met the learners only during the oral presentation session. It is important to highlight too that supervisors play a major role, contributing 70% if the weightage for the MP report while compared to reviewers provide only 30%.

To conclude the findings and discussions in this section, the evaluation through scoring marks from the supervisors and reviewers fulfil the requirements set by the MQA through the achievement of the course learning outcomes ranging from 50 percent to 82.63 percent that has been mapped earlier in this course. The lowest marks obtained was 50 percent (CLO 5) followed by 51.07 percent (CLO 2) in which the critical learning outcomes need to be addressed by the programme directors. Appropriate supports and activities must be planned to improve the learning outcomes of the master's project. Supervisors and lecturers in the cluster should continuously help learners in clarifying the intended learning as the lessons unfold. Eventually, it is expected that learners will be able to direct their own learning.

Higher marks awarded by the supervisors and reviewers to each learner means greater success for the learner in grasping the course learning outcomes. However, evaluation of perceived learning outcomes emphasizes the importance of reflection and self-assessment.



Learning will be easier and holistic when learners understand what goal they are trying to achieve.

## CONCLUSION

The aim of this study is to evaluate the final year master's project course learning outcomes through survey feedback as a self-assessment and scoring marks as a direct assessment. Higher marks awarded by the supervisors for the CLOs indicated that learners are competent to finish the course studied as well as fulfil the requirements set by the MQA through the mapping done between the course learning outcomes, learning domains and the assessment method. Meanwhile, learners' self-reflection on the CLOs suggests the ability to conduct the research, despite the challenges to kick-start and write the project report. In addition, marks awarded by the supervisors and reviewers indicated some agreement and contradiction with what learners perceived. Learning will be easier and holistic when learners understand the goals they are expected to achieve for the desired learning outcomes. The evaluation conducted in this study assists in assessing and reflecting on what to improve, focus and support for better understanding of the course. It is compulsory to complete the master's project in order to fulfil the requirements of the six programmes in line with the MQA standard programme guidelines. This study proven to be important as part of the curriculum evaluation process as feedback through direct and indirect methods of assessment were obtained using the CLO mapping with the learning domains from learners, supervisors, and reviewers. This study emphasises the need to highlight the CLOs before learning takes place as well as other best practices. In addition, activities and support to the learners will be identified to tackle the critical course learning outcomes of the master's project. It is suggested that the evaluation process introduced is used consistently in this course across programmes and further evaluated with a more participants. Continuous support from all parties is crucial in achieving the intended learning outcomes as the lessons unfold so that learners are able to easily manage their learning pace.

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