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Study on student peer assessment for practical task evaluation in thermodynamics course

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ABSTRACT

Peer assessment is a process whereby students peers grade assignment or practical task based on a lecturer's guidelines. A set of Rubrics are often used in conjunction with peer assessment. The objective of study is to design an instruments for student peer assessment in practical task evaluation for Thermodynamics laboratory. The data were collected from 37 respondents in Thermodynamics laboratory through a set of questionnaires. The data were analyzed in descriptive manner of score mean and standard deviation by using Microsoft Excel 2013. The findings show a positive reaction from the respondents over the implementation of peer assessment. The score mean is 3.58. Implementation of Peer assessment in Thermodynamics course to support not only students' learning but also improve their understanding of the assessment processes themselves.

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Introduction

Learning outcomes in Teaching and learning process depends on the practice of learning and assessment approaches. It can be assessed using laboratory work include an understanding of procedures, safety and health and scientific methods. Practical is a part of the curriculum, to provide students experience by conducting experiments in the laboratory and students well understand a phenomenon of learned (Atan & Noordin, 2008).

Practical task is part of the requirements of the Thermodynamics courses in addition to learning theoretically. Students can identify their own needs to justify, plan, interpret data and evaluate all decisions and actions. Assessment while students are doing practical in the laboratory should be implemented to ensure that students achieve on their learning.

Experience in an engineering laboratory is important role for engineering students (Feisel & Rosa, 2005). By attending laboratory classes and handled the equipment, the students are likely to appreciate more details about the appearance and function of the laboratory. Evaluations suggest that these laboratory experiences are just as likely to enhance understanding of related concepts for which students have learned theory. The study aim to design a method for student peer assessment in practical task evaluation for Thermodynamics laboratory. For practical task to become more effective, we first need to be more clear and precise about the purposes of each practical activity and the evaluation.

Peer Assessment

Peer assessment is a method that has the potential of addressing some of the outstanding issues, such as peer assessment may enable the development of generic graduate attributes. These attributes refer to the skills, knowledge and abilities of university graduates. Peer assessment involves students taking responsibilities for assessing the work of their peer against set assessment criteria. It can helps to reduce the power imbalance between lecturers and students and can enhance the student status in the learning process.

Students also receiving feedback from their peers can get an ideas about their practical task to improve their study. Students can help each other to make sense of the gaps in their learning and understanding and to get a more sophisticated grasp of the learning process. The peer assessment need to students practice to gain confidence to become more competent. The rubric of peer assessment provided to students should be clear easy to understand (Spiller, 2012).

Rubrics

Rubric is guided scoring to tool to evaluate of the quality of students' constructed responses (Andrade, 1997). Scoring rubric include one or more dimensions on which performance is rated. Rubrics can be classified as holistic, analytic, or developmental. Holistic rubrics integrate all aspects of the work into a single overall rating of the work.

Method

The design of study used descriptive methods survey. The total number of respondents were 37 from Diploma Mechanical Engineering Department of Polytechnic Sultan Mizan Zainal Abidin. The sample was consist of 29 male and 8 female. The instruments using a set of questionnaire and the data were analyzed using Microsoft excel 2013. The questionnaires were developed with a series of questions to be answered on a Likert scale of four possible responses, ranging from "1-strongly disagree" to "4- strongly agree". Figure 1 shown the assessment practical task activity in Thermodynamics Laboratory.

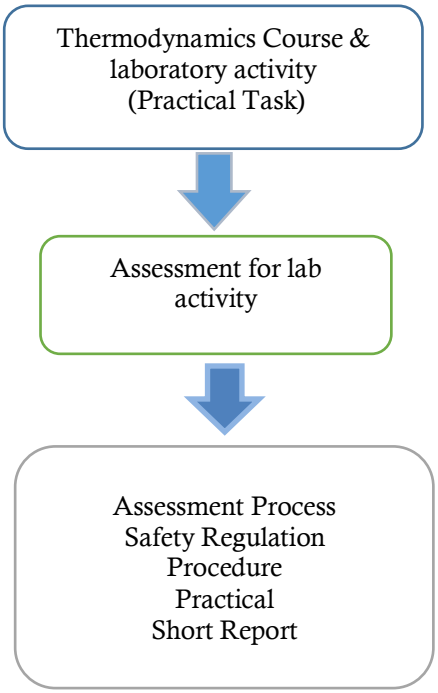

Figure 1 <Thermodynamics Laboratory Activity>

Result and Discussion

Table 1 shown 76% of respondents are male and 24% are female. Table 2 shown the students perception towards peer assessment that will be implement during the practical task in Thermodynamics Laboratory. In general terms, the student's perception of peer assessment was positive, as the mean score for all questions was above (mean score 3.5).

Table 1 <Percentage of Gender>

Gender	*f*	Percentage (%)
Male	28	76%
Female	9	24%

Table 2 <Frequency of Students Perception Towards Peer Assessment>

	Items	f	%	f	%	Mean score
B01	Understand about peer assessment.	1	2.7%	36	99%	3.65
B02	Ready to participate in a peer assessment process in the Thermodynamics laboratory.	2	5.4%	35	94.6%	3.46
B03	Rubrics of peer assessment are brief by lecturer.	0	0%	37	100%	3.92
B04	Peer assessment make students prepare their work better.	3	8.1%	34	91.9%	3.13
B05	Peer assessment make students responsible to learning process.	2	5.4%	36	94.6%	3.14
B06	Peer assessment makes the students understand about the activity process.	2	5.4%	36	94.6%	3.86
B07	Peer assessment allow to detect the mistakes.	1	2.7%	36	99%	3.78

The perception of student responsibility in this assessment system varies according to the type of activity performed. In Thermodynamics Laboratory, students understand about peer assessment (mean score 3.65). However, before starting the practical task, the lecturer must be explain briefly about the evaluation to be used. Peer assessment for practical task need to be constructively aligned with the elements of teaching and learning. The activities are to be implemented in ways that directly and explicitly promote the development of students attributes (Gomes, Spandagou, & Ahmadi, 2008).

Students also ready to participating in peer assessment (mean score 3.46) process in Thermodynamics Laboratory with a guided by rubrics (score mean 3.92). We believe that simply by rubrics available to students before start the practical task in Thermodynamics Lab, they were more actively engage with the assessment task. They had to think critically about what is expected their practical task around the rubrics given to them. With peer assessment, students think they are better prepared to perform the practical task in Thermodynamics Laboratory (mean score 3.13). The students also take a responsibilities for their peers and their work. Peer assessment has been improve student understanding of the assessment processes themselves (Bloxham* & West, 2004) .

Conclusion

In Thermodynamics Laboratory, students work in groups. The size of the group from 4 to 6 depends on total students in the section. When students work together as a team on practical task, each student has to take on their responsibility for a task. Lecturer often find it difficult to determine what each individual has contributed to the group task (Sluijsmans, Moerkerke, Van Merrienboer, & Dochy, 2001). Introducing peer assessment can be a way to force students to take the responsibility to make an evaluation about the actual contribution of their peers in the group.

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References

Andrade, H. G. (1997). Understanding rubrics. *Educational leadership, 54*(4), 14-17.

Atan, R. B. M., & Noordin, S. B. (2008). *Hubungan antara amalan kerja amali dengan pencapaian pelajar tingkatan empat dalam tajuk daya*.

Bloxham*, S., & West, A. (2004). Understanding the rules of the game: marking peer assessment as a medium for developing students' conceptions of assessment. *Assessment & Evaluation in Higher Education, 29*(6), 721-733.

Feisel, L. D., & Rosa, A. J. (2005). The role of the laboratory in undergraduate engineering education. *Journal of engineering Education, 94*(1), 121-130.

Gomes, V. G., Spandagou, I., & Ahmadi, M. (2008). Peer assessment in imparting graduate attributes. *Chemeca 2008: Towards a Sustainable Australasia*, 1794.

Sluijsmans, D. M., Moerkerke, G., Van Merrienboer, J. J., & Dochy, F. J. (2001). Peer assessment in problem based learning. *Studies in educational evaluation, 27*(2), 153-173.

Spiller, D. (2012). Assessment matters: Self-assessment and peer assessment. *The University of Waikato, 13*.