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Tips for New Engineering Teachers on Assessment

Assessment is probably not a new concept for new teaching staff at the university, as most of them would have gone through heavy testing and examination procedures before they can successfully become teachers at the university. However, many teachers who are new to university teaching are not aware of the highly significant impacts that assessment can have on the quality of student learning, even though they have been heavily assessed previously.

Assessment has been commonly and wrongly viewed as merely the final outcome measure of students' skills and knowledge at the end of a course, providing an indication of students' level of competency – quite simply "a number to the name". But in reality, assessment reflects the overall effectiveness of teaching and learning, and provides insights to guide students for appropriate approach to learning, and also guide teachers for appropriate teaching styles and activities, it is also an indicator for university quality assurance. In fact, assessment is the central element in the overall educational process of teaching and learning in higher education. However, teachers often treat the design of assessment as an add-on component to the curriculum design. Little or no thoughts are dedicated to the design of the assessment. And usually, only traditional summative assessments such as examination and essay type of assessments are employed.

For students, assessment basically defines the direction of their learning as assessment drives student learning. It consequently determines students' approach to study, and therefore indirectly determines the quality of their learning. Thus, teachers can make use of assessment as a strategic tool to direct their students to the appropriate studying approach to achieve the desired learning outcomes in their courses. Also, teachers need to always keep in mind the purpose of assessing when designing the assessment. Assessment should exhibit clear alignments with the intended learning outcomes, as well as the teaching and learning activities, which are considered altogether as the three core elements in the outcomes based approach of curriculum design in higher education. This is true not just for tests, assignments and exams, but also for engineering laboratory work exercises and projects. **Thus, when designing the course, the three core elements – the Intended Learning Outcomes, the Teaching and Learning Activities and the Assessment – should be aligned constructively and designed interdependently and simultaneously.**

Good assessment practice should set clear expectations and give a reasonable workload (which does not force students into the mode of rote learning and regurgitation of memorized materials without genuine and deep understanding). Over-assessing is time-consuming for both teachers and students and may even have a counter-productive effect. This is particularly true for engineering, when the contact hours are quite high. Bear in mind the question: “When do the students have time to study and to conduct the assessment?”

On one hand, assessment should place attention to outcomes and achievements of students (acting as a quality assurance mechanism to protect academic standards in the “summative” sense), but it should also emphasize the learning experiences of students that can lead to these desired learning outcomes (on-going development of skills and competency of students in the "formative" sense).

Assessment should be accompanied by timely and useful explanatory feedback that recognize students' achievement and at the same time provide appropriate suggestions for improvement.

- **Clear expectations** – Assessment works best when its purposes and expectations are clearly explained to students. Students can study efficiently when they have a clear idea of a particular goal. It is important that the assessment methods are aligned with the course learning outcomes and teaching activities.
- **Transparency** – Transparency in the marking of assessment is important so that students understand how their grades are determined.
- **Validity** – Assessment should reliably measures the expected learning outcomes it is intended to measure, especially on the higher-order cognitive skills that students have acquired.
- **Discourages Rote-Learning** - If the assessment employed encourages rote learning, students will perceive that rote learning is what is valued by the teacher. Our knowledge about the world is expanding at an extremely rapid rate. It is impossible to always keep every piece of knowledge in our memory for instant retrieval. Assessment should therefore put greater emphasis on how students can identify and access relevant information when required, rather than their ability of keeping everything in the memory.

- **Avoids Plagiarism** - With carefully designed assessment, the likelihood of committing plagiarism can be reduced. Teachers can adopt assessment that require students to incorporate their original perspectives and creativity in their answers, such as personal reflection on social issues or writing critiques of journal articles, instead of adopting the kind of assessment that encourage students to recite the perspectives of the others, such as asking for a description or summary of the theories of a particular theorist.
- **Variety** – A variety of assessment methods in a course allows a wider range of learning outcomes to be assessed. Students will learn a wider range of knowledge and skills, and that will also keep them engaged with greater interest and motivation. Assessment should involve elements of both subject-specific knowledge and generic skills. As nowadays, generic skills such as interpersonal and presentation skills, communication, and group work skills are increasingly being recognized and valued by employers, it is important to develop new assessment methods to validly assess these generic skills, which cannot be properly done by traditional assessment methods such as essays and exams.

Web Reference and Resources

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