

**Rethinking assessment in medical education,
a reflection on programmatic assessment
based on experience from the University of
Adelaide**
Pedagogiskt docenturarbete

Stina Garvin

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Background

When I set out to Adelaide, my aim was to return with a new digital tool in my “examiner’s toolbox”, a novel method of written assessment that could be applied as a complement to our current system of summative examinations. As a member of the Theme Group Mechanisms, I have shared responsibility for constructing and grading modified essay questions (MEQ) for high-stakes summative examinations for semesters three and five of the medical program at Linköping University. I felt it increasingly challenging to uphold reliable standards in testing higher cognitive skills in a clinical context in the face of the dramatic increase in student numbers. I was looking to improve our assessment *of* learning.

I have had the unique opportunity to spend six months at the Medicine Learning and Teaching Unit, University of Adelaide, exploring the “what”, “how”, and “why” we examine our medical students. It soon became clear to me after talking with their assessment experts that the real question is, how can we improve our assessment *for* learning?

Programmatic Assessment

Constructive alignment refers to the use of a framework to guide all levels of course design, from creating objectives and determining teaching/learning activities to assessing student performances (1). In this case the “skills a doctor needs” are broken down into objectives or intended learning outcomes and systematically applied to align teaching/learning activities and assessment methods. The idea of incorporating assessment as a more integral part of education (assessment for learning) was pioneered by the work of Martinez and Lipson (1989), who envisioned a model of assessment tailored to the individual student’s needs, providing feedback to enable the student to monitor her own learning, and helping teachers to identify learning gaps (2).

In line with the shift in discourse within education from reductionist to social constructivist theories, the concept of programmatic assessment was put forward by van der Vleuten and colleagues (3). The key feature of programmatic assessment is to obtain a more complete picture of a student’s competencies by combining a variety of assessment methods which in turn provide meaningful feedback to the student to guide future learning (4). Three central objectives are incorporated in the model: 1) maximal facilitation of learning, 2) maximal robustness of high-stakes decisions, and 3) inbuilt feedback for improvement of the curriculum (4, 5).

The model can be described as a careful orchestration of learning activities, assessment activities, and supporting activities (4). Here the supporting activities allow the learner to reflect on feedback provided through the assessment and plan new learning tasks. In addition, information from various assessment sources inform about all the competency domains (in the medical setting, domains such as “medical expert”, “communicator”, or “professional” as defined by the institute itself) (5). Traditionally, assessment has focused on the format rather than the content. If a student fails the ankle examination station in an objective structured clinical examination (OSCE), she may still pass the exam by compensating with a high

score on the communication station. Yet the information becomes more meaningful if the student who fails an anatomy component of the OSCE also scores poorly on anatomy items on the written examination. Moreover, an individual assessment item may be meaningful in itself, such as unsatisfactory patient history taking in a Mini-Clinical Evaluation Exercise (Mini-CEX), which may not need to be added to the rest of the items (6). Intermediate evaluation is focused on remediation, helping the student to construct her own plan for improvement and further learning while the final evaluation (pass-fail decision) is made by a committee of examiners after careful consideration of all the accumulated data (4).

The medical programs at Linköping University and the University of Adelaide are rooted in constructivist learning theories, that students construct their own knowledge and skills, scaffolded in horizontally and vertically integrated programs centered upon problem-based/case-based learning. Programmatic assessment is well aligned to the constructivist learning approach, supporting life-long-learning through its emphasis on feedback, remediation, and self-directed learning (7).

Retrofitting programmatic assessment: work in progress at University of Adelaide

In contrast to Maastricht University, where programmatic assessment was integral to the primary design of their graduate-entry medical program, University of Adelaide has recently taken steps to incorporate elements of programmatic assessment into the existing structure of Year 1 of their Bachelor of Medicine and Bachelor of Surgery (MBBS) program. The course is in three parts based on the competency domains Scientific basis of medicine, Clinical Skills, and Medical professional and personal development (MPPD). Information from various sources is combined for the pass-fail decision in each part. For example, for Scientific basis of medicine, the scores on the written Medical Knowledge Exam (mid-year and end-of-year) are combined with evaluations from anatomy resource practicals and case-based-learning tutor assessment of student knowledge. For Medical professional and personal development, various tutor assessments are combined with performance on written Clinical Reasoning Examinations (MPPD/Ethics components), OSCE (professionalism, ethics and communications skills stations), an indigenous health assignment, and MPPD tutorial assignments. To pass Year 1, the student must achieve at least 50% on all three parts. Formative tasks include practice exams and web-based anatomy and pathology quizzes as well as group learning sessions, a combination of case-based learning sessions, clinical skills tasks, and MPPD assignments.

How could we use assessment to incorporate more meaningful feedback and guide self-directed learning?

We know that assessment drives learning (8, 9). There is also evidence that formative feedback enhances learning (10, 11) while merely providing grades or normative scores of student performance in relation to peers is a poor kind of feedback, tending to impede further learning (11). In order for assessment to drive learning and foster self-directed learning, it is imperative that the assessment produces meaningful information to the learner (4).

In my view, the current curriculum at the medical program at Linköping University lacks formalized formative elements. My personal experience is that this has been compensated for mainly through the engagement of experienced problem-based-learning tutors, who have provided timely and meaningful

feedback to guide self-directed learning, for example through good use of the mid-semester student-tutor discussion (mitterminssamtal).

Interestingly, one of the paradoxes of self-directed learning is that it often requires external direction and support (12). “Social scaffolding” as described by van der Vleuten provides this support in the form of a social interaction, with a mentor or with senior students or peers (4). Furthermore, structuring and documentation of the reflective activity may facilitate the process (13). In this way, social scaffolding and documentation are already embedded in the mid-semester student-tutor discussion (mitterminssamtal) if used effectively.

A critical element which is lacking, however, is the “formative assessment loop” or “feed-forward” (10, 11, 14). Although written instructions to problem-based-learning tutors suggest that they may meet with individual students again at the end of the semester to follow-up on the mid-semester discussion, it is left to the tutor’s discretion and (in my experience) rarely occurs. Therefore, the student is not supported in completing the feedback loop, in examining if the learning goals as formulated as part of the reflection have been reached and in formulating plans for future learning (15). It is indeed the completion of this feedback loop that is considered essential to true and meaningful feedback and critical for facilitation of learning and expertise development (16, 17) .

How can we utilize our assessment tools differently to stimulate learning?

Like the University of Adelaide, the medical program at Linköping University already uses many different formats of assessment, from more traditional knowledge based written exams to OSCEs, but the results have been determined by cumulative score of the content rather than by determining the student’s understanding of a specific content based on aggregated information from various formats. Using a clinical analogy, no doctor would average the patient’s laboratory values (high glucose compensating for low potassium for example) and determine that the patient was healthy (5). Rather, relevant information is extracted through careful history taking, physical examination, laboratory tests etc. to reach a *diagnosis* and suggest a *therapy*. Our system of assessment should aim to do the same for the student.

The key according to van der Vleuten and colleagues is to “ensure that every low-stakes assessment provides meaningful feedback for learning”(7). The *diagnosis* entails identifying the student’s strengths and weaknesses. The *therapy* is a personalized remediation plan, created by the student with the support of a mentor/teacher. At Linköping university medical program, we have a wealth of opportunities for assessment based on observations of the student in problem-based-learning sessions as well as in the clinical setting (Strimman). Following the example from University of Adelaide, it would be possible to formalize tutor assessments of the students, although this must be done with caution in order to preserve tutor groups as a “safe space” where the student can admit what she has trouble understanding (4). In addition, by becoming an assessor, we must be aware that the relationship between the tutor and the learner may be compromised (18).

Challenges to introducing programmatic assessment

There is a danger in implementing “programmatic assessment” simply by adding a series of scores from various assessments or aggregating a number of pass/fail decisions in a portfolio (19). In one of the few papers examining the impact of programmatic assessment on medical student learning, Heeneman et al conclude that even in a carefully constructed program of programmatic assessment, some students still perceived formative elements as summative (15). In addition, elements such as feedback, assessments, and portfolio were considered by some students to support learning, by others to inhibit learning. Their analysis showed that whether an element would support or inhibit learning depended primarily on how it was perceived by the individual learner. Thus the “why” of programmatic assessment must be understood and valued by students if true “assessment for learning” is to be achieved (7, 15, 20).

Likewise, the teaching faculty and staff must appreciate the underlying principles of programmatic assessment if it is to be successfully introduced (7, 19, 20). It is important to remember that the majority of teachers (as well as students) have constructed their views on education based on the classical summative pass/fail system (15). In the implementation process, communication between stakeholders at all levels is critical (7).

Last but not least, the costs and resources needed for introducing programmatic assessment must be considered. In programmatic assessment, gathering rich information (quantitative and qualitative) from various sources over time is essential (7). Thus a close collaboration between administrative staff, IT- and assessment-experts is a necessity.

Conclusions

I am extremely grateful for the opportunity I have been given to explore the many aspects of assessment and to rethink assessment as a means by which to drive learning. In my continued work within Theme Group Mechanisms, I believe that incorporating elements of programmatic assessment will provide more meaningful feedback to the student and promote self-directed learning. Furthermore, in conjunction with the restructuring of the medical program curriculum, there will be new opportunities for the faculty to redesign a master plan for assessment, using what we already have in terms of assessment modalities, but applying them with a programmatic approach. Programmatic assessment is well-aligned with the pedagogic values at Linköping University medical program and may be a powerful tool to improve assessment *for* learning.

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