Changing Assessment Practice through *in situ* Faculty Development

G.E. Pickworth* and W.D. Snyman†

School of Dentistry, Faculty of Health Sciences, University of Pretoria, South Africa

**Education Consultant*

†*Programme Manager*

Correspondence

G. Pickworth

Faculty of Health Sciences

University of Pretoria

Pretoria, South Africa

Tel +27 12 354 1909

Fax +27 12 354 1988

e-mail: glynis.pickworth@up.ac.za

Declaration: No conflict of interest was declared.

Abstract

The aim of this article is to describe the process of an *in situ* staff development process with the objective to influence change in assessment practice. An *in situ* training course focusing on writing questions for written examinations, but also including some contextual aspects of assessment practice, was therefore developed and implemented. The anticipated change was measured against Kirkpatrick's four levels for evaluating training programmes. As a whole the reaction from the participants was positive (Kirkpatrick Level 1), and in a number of instances learning, which includes changes in attitude, knowledge, and skills (Kirkpatrick Level 2) and change in behaviour (Kirkpatrick Level 3) was observed. To conclude the staff development initiative in the

form of *in situ* assessment training facilitated change resulting in an improvement in assessment practice in the School in a relatively short period of time.

Key words: staff development, assessment practice

Introduction

Operating within an outcome-based / competency-based philosophy, universities need to change and align their operation within this framework (1,2). Lecturers need to formulate explicit learning outcomes and assessment criteria, which are aligned with the exit level outcomes of the programme. They are expected to function in curriculum and module development committees rather than as individuals, and they are required to view the curriculum through their university's vision, rather than from their own discipline. This implies that academics need to develop new and improved skills to deal effectively with modern educational practice (3).

Faculty (Staff) Development has a critical role to play in promoting academic excellence and innovation. It has been identified as a predictor of the success or failure of efforts to revise health professions curricula (4). Educational reform or change is a complex undertaking and success with regard to faculty development is dependant on the planning and the process employed (4). The method of training used for faculty development will influence the effectiveness of developing the complex knowledge, attitudes and skills required for good teaching practice. Research has shown that *in situ* training is more effective than withdrawing staff to attend short courses (5). The *in situ* training involves academic staff developers working with an entire academic work

group, such as a department, and focuses on the objectives and activities of that group. Professional enquiry and discussion are encouraged within the group. This serves to challenge staff to focus on and reflect on what they do. Change is more likely if the whole group is committed to change and support each other in the change (5).

Written examinations traditionally form part of the assessment plans in dentistry. This custom also applies to the School of Dentistry University of Pretoria, and all papers received from the module teams are required to be evaluated/moderated by the Programme Manager. This forms part of a quality assurance process. Miller's pyramid (6) provides a framework for assessment and it describes two types of outcomes: cognitive (knowledge) and behavioural (see Fig. 1). Cognitive outcomes can be assessed at a 'Knows' (recall) or a 'Knows how and why' (application, critical thinking, problem solving, etc.) level. Evaluation of final-year papers revealed that many questions were asked at a recall rather than at a higher cognitive level. It became apparent that there was a dire need for the training of lecturers, especially young and inexperienced lecturers and 'second career recruits into dental education' (4).

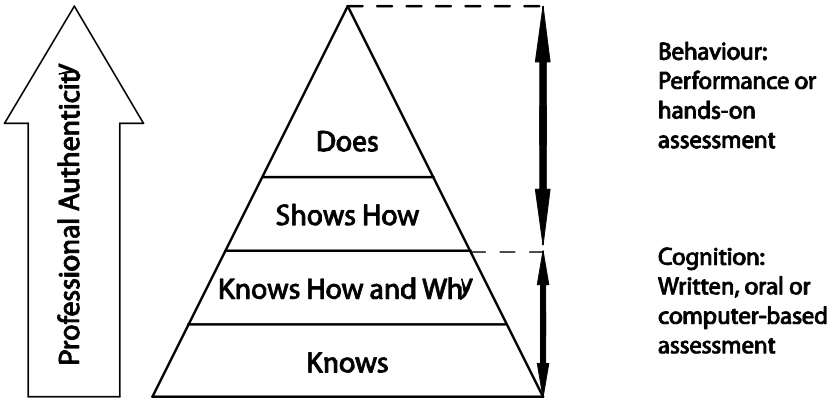

Figure 1. A simple model of competence (Adapted from Miller's pyramid)

Aim and context of the intervention

Late in 2008 the Human Resources Development Committee of the School of Dentistry at the University of Pretoria, on the strength of the above findings, identified a need for training for lecturers in assessment practice. The authors were asked to devise a short course on assessment with a focus on written examinations. The aim of the intervention was to change assessment practice through *in situ* staff development. It is to be noted that the University of Pretoria offers a three-day, off-site course on assessment for lecturers three times a year. However, it was felt that it was too time consuming for staff to be away from their clinical duties for this length of time. A requirement for the training was that it would take place at the School of Dentistry and would be presented to each of the relevant module teams, during a series of short sessions scheduled over time. This would allow the training to be scheduled at times that would be convenient to each of the module teams. The training was to take place during the first half of 2009. This is in line with the method of *in situ* training (5) described in the introduction.

Intervention

A short hands-on training course, consisting of seven one-hour sessions, with outcomes focusing on writing questions for written examinations, but also including some contextual aspects of assessment practice, was developed by the authors. Literature reviews of the efficacy of staff development training indicate that lecturing alone is unlikely to change behaviour, but that a mixture of hands-on, active-learning strategies

and debate can result in change in attitude and teaching behaviour (4, 7). Each session was thus designed to engage participants in a task and group discussion.

The anticipated change was measured utilising Kirkpatrick's four levels for evaluating training programmes (4, 7, 8). The first level focuses on *the learner's reaction to the educational experience. The second level is an indicator of learning which includes changes in attitude, knowledge, and skills,* the third level considers *behaviour, which includes changes in practice,* and the fourth level indicates the *results, which refers to changes in practice, policies or infrastructure of the overall organisation.*

The course consisted of seven one-hour sessions with the following outcomes:

Outcome session 1: Reflect critically on the University and School's Policy documents relating to assessment.

Outcome session 2: Critically debate the implication of the following educational constructs namely deep and surface learning, validity, reliability and the educational impact relating to assessment.

Outcome session 3: Evaluate a previous written examination paper of the module.

Outcome session 4: Align the specific outcomes and assessment criteria for the specific module with the exit level outcomes of the BChD programme.

Outcome session 5: Develop an examination blueprint and write questions for an examination paper for the specific module.

Outcome session 6: Develop a marking memorandum or rubric.

Outcome session 7: Moderate the newly prepared examination paper.

It is important that staff understand and apply the institutional policies that regulate assessment practice. As a point of departure, participants were introduced during Session 1 to the University of Pretoria's overarching assessment policy which consists of 12 principles for assessment practice. Participants also worked through the School of Dentistry's assessment policy document. A jig-saw group method (9), an efficient way to learn the course material in a cooperative learning style, was used to reflect critically on these policy documents regulating the assessment in the School. For the jig-saw method the policy document was divided into sections. Different participants were responsible for reading different sections of the policy and then had to report back to the whole group on their section of the policy document and comment on the implications of the policy on assessment practice.

During Session 2 the concepts of deep and surface learning (10), as well as validity and reliability, as applied to assessment, were introduced and participants participated in a group exercise that triggered debate on the importance and application of these concepts. Assessors need to understand these concepts and plan assessment with them in mind.

During Session 3 the most recent BChD final-year written examination paper for the module was evaluated using Bloom's taxonomy (11). Participants determined the percentage of the total marks allocated to recall (first level of Miller's pyramid) and the percentage allocated to higher order cognitive processes (second level of Miller's pyramid).

Constructive alignment of outcomes, assessment and teaching activities is an important educational principle (12). During Session 4 the module team worked through a list of the Exit Level Outcomes (competencies) (ELOs) and associated assessment criteria of the dentistry programme developed and approved by the School. The group identified the ELOs relevant for their module. They then compared the ELOs they had marked with the specific outcomes in the study guide for their module. Discrepancies between the ELOs and study guide specific outcomes necessitated a revision of a study guide. A couple of small changes to the ELO document were recommended as a result of this exercise.

During Session 5 the module team was challenged to discuss the whole assessment plan for their module, bringing to bear what they had discovered during the previous sessions. The question 'What is the purpose of a written examination paper in the final year?' was discussed. If a written paper was still to be part of the assessment plan, then an assessment blueprint to identify outcomes to be assessed through this assessment modality was developed. Participants had to compile a new examination paper challenging the students' higher order thinking and diagnostic reasoning skills utilising authentic case studies.

During Session 6 issues around the reliability or consistency of marking practice were discussed. The concept of a marking memorandum or an assessment rubric (13) allowing assessment to be more objective and consistent was introduced if participants were not familiar with it.

During Session 7 the new examination paper compiled during or after Session 5 was moderated by the module team. The assessment policy of the School requires that test and examination questions for the written assessment are moderated by the various module teams. This exercise was to facilitate and improve the effectiveness of this process.

Implementation

The intervention was tabled at and endorsed by the BChD Curriculum Committee and attendance of the course was regarded as highly desirable. The training course was presented seven times so that it could be scheduled for each of the seven module teams responsible for the final year modules. Each module runs over the third, fourth and fifth years of the BChD curriculum. The module teams consisted of between five and nine participants and each team attended the same sessions as a group. The sessions were offered over a period spanning February to July 2009 depending on the availability of each module team. The sessions were facilitated by the authors and, as described previously, focused on practical activities that stimulated interaction and debate. Attendance by the teams ranged from 68% to 100% with a mean of 86%.

At the end of the course participants were asked to provide feedback on the course by responding in writing to three questions to measure the participants reaction (level 1) to the educational experience according to Kirkpatrick's four levels of educational outcomes (4, 7, 8).

What did you enjoy/find beneficial?

Suggestions for improvement?

Any other comments?

Description of the training sessions and participants' feedback

Staff, due to clinical and teaching demands, find it difficult to take time off to attend training sessions. The short course of seven one-hour sessions presented *in situ* in their departments made it feasible for them to attend. As indicated, overall attendance was high (86%).

Participants gave written feedback in response to the three questions above. In response to what they enjoyed/found beneficial, participants mentioned a range of aspects pertaining to the training. Examples of these responses are woven into the text below. Only a few gave suggestions for improvement and these reflected two themes: to provide reading material before the session and to provide more time for discussion and more sessions. The only responses to "Any other comments?" were "None" or "Thank you". The feedback reflected a positive response to the training.

The facilitators were mindful of the limited time available and from some of the feedback comments appear to have set a brisk pace. However this did not seem to have a negative effect on participants' experience.

'*Like the fast pace. Good that it isn't drawn out.*'

'*Time usually not enough for these discussions.*'

'*Having to do a practical exercise of real life value under time pressure really teaches you a lot. Things that you will not forget.*'

The practical nature of the course engaged the participants in reflecting on and discussing their assessment practice. One participant reported that they had found the '*Active participation and learning new concepts. Introspection*.' beneficial.

An important advantage of each module team undergoing the *in situ* training (5) together was the opportunity for the members of the team to be exposed at the same time to the inputs on assessment and for them to discuss and reflect on their practice. This was reflected in the following comments:

'*The fact that we are beginning to understand one another's thought processes within the Department.*'

'*We should have more of these departmental discussions.*'

The discussions helped the facilitators gain insight into the participants' understanding of current assessment practice. A few misconceptions could be rectified as indicated in the following response: '*Got new ideas of clarification on some misunderstandings previously obtained* '. A few participants mistakenly thought that a written examination at the end of the final year was obligatory.

During Session 1 it was found that few staff were conversant with either the institutional or the School assessment policies. One participant found '*First hand reading and experience of policies. Discussing them with colleagues.*' beneficial. Another remarked '*I didn't know about the policy and guidelines.*'

The exercise in Session 2 was useful to get everyone 'on the same page' with respect to concepts such as deep and surface learning, validity and reliability.

'Difficult' concepts have been explained very clearly. It now makes it easy to internalise the 'language of education' which I feel is rather important for the 21st century educationalist!'

The evaluation of a written paper during Session 3 highlighted the cognitive level at which questions were asked. The groups found that the use of mainly recall questions was the norm regarding previous written examination papers. This relates to deep and surface learning. Too much emphasis on recall promotes surface learning (10). This exercise is often an eye-opener for lecturers as reported in the following responses indicating what participants found beneficial regarding this exercise:

'*Learn to evaluate a paper properly and to set questions on a higher cognitive level. How to formulate questions properly. Also to set a memorandum correctly by using rubrics.*'

'*Evaluation of the exam papers. Interesting ideas were created by this exercise, which I think will lead to a new way of teaching / assessing.*'

The Exit Level Outcomes (ELOs) of the BChD programme were unfamiliar to a number of lecturers and initially largely regarded to be of little value. The exercise in Session 4 confirmed that the ELOs were valid as only small changes to the ELOs were recommended. The exercise resulted in the alignment of the module's specific outcomes (as expressed in the study guides) with the ELOs (12). The importance of aligning the module learning outcomes with the ELOs became evident to the module teams.

During Session 5 most module teams discussed the whole assessment plan for the module and as the session was only an hour long they often did not get to writing new questions for an examination paper. The facilitators were flexible in this regard as it was felt that the discussions were important. After the session participants were provided with a reference to an article on an assessment toolbox providing information on a number of assessment methods relevant for dental education (14).

Although the primary focus of the course was on written examinations, participants found Session 6 which focused on rubrics and other marking schemes, especially useful for the clinical context. In a number of sessions the assessment of clinical work was discussed and marking schemes either developed or revised.

Only three of the seven module teams managed to compile a new examination paper which could be moderated during Session 7. However, as indicated in the next section, all the module teams did submit higher cognitive level examination papers to the Programme Manager. Although the practice of using external examiners is well established, there is often little or no internal group moderation of test and examination

papers. One participant who found this session beneficial responded in the feedback: '*The importance of peer reviewing and standardizing our way of asking questions. The moderation of the exam paper was quite eye-opening.*'

Outcome of the course

As previously indicated, the feedback from the participants was positive (Kirkpatrick's level 1) (4, 7, 8). At the end of the training (July 2009) a number of instances of change in behaviour was observed (Kirkpatrick's levels 2 and 3) (4, 7, 8). In two of the module teams, discrepancies between the ELOs and study guide outcomes resulted in a comprehensive revision of the study guide, while only minor changes were necessary for the remaining five study guides. Two module teams changed their whole assessment plans. Three other teams anticipated revisiting and changing their entire assessment plan, as well as the type of questions to be set in written exams, as well as adapting teaching activities aligned with the assessment. This reflects their new understanding of the necessity to align curriculum planning, assessment and teaching activities. Three of the module teams compiled and set a new examination paper with improved valid and reliable examination questions of which the cognitive level of the questions was raised to focus on critical thinking and diagnostic reasoning. At the time of the final examinations in October 2009 all written papers submitted to the Programme Manager assessed at higher cognitive levels.

Table 1: Summary of observed behaviour change according to Kirkpatrick's levels for evaluating training programmes.

Module teams	Observed change	Kirkpatrick level 2 Change in attitude, knowledge and skill	Kirkpatrick level 3 Change in behaviour and practice
1	Comprehensive revision of study guide for alignment with ELOs.		X
	New assessment plan compiled.		X
	New examination paper set: questions aligned with outcomes and at a higher cognitive level.		X
2	Minor changes to study guide needed for alignment with ELOs.		X
	Intention to change assessment plan.	X	
	New examination paper not set by end of training.	-	-
3	Minor changes to study guide needed for alignment with ELOs.		X
	Intention to change assessment plan.	X	
	New examination paper not set by end of training.	-	-
4	Comprehensive revision of study guide for alignment with ELOs.		X
	New assessment plan compiled.		X
	New examination paper set: questions aligned with outcomes and at a higher cognitive level.		X
5	Minor changes to study guide needed for alignment with ELOs.		X
	Intention to change assessment plan.	X	
	New examination paper not set by end of training.	-	-
6	No changes necessary – study guide already aligned with ELOs.	-	-
	Assessment plan in place prior to training.	-	-
	New examination paper set: questions aligned with outcomes and at a higher cognitive level.		X
7	Minor changes to study guide needed for alignment with ELOs.		X
	Intention to change assessment plan.	X	
	New examination paper not set by end of training.	-	-

ELOs = Exit Level Outcomes

Discussion

The implementation of the training was highly flexible. The sessions could be scheduled to suit each module team which accounted for a high attendance. This made the intervention time intensive for the facilitators. The interactive nature of the sessions engaged the participants and allowed the facilitators to attend to the participants' needs both during the sessions and regarding the scheduling of the order of the sessions. The uniformity of the group with similar interest and goals also contributed to the openness and degree of participation/interaction by the module members. In one of the seven groups the module coordinator and leader of the module team did not attend the

training. With hindsight we can recommend that the module coordinator be part of the process to lead and facilitate change. The module coordinator could be engaged in discussion prior to the course to sell the concept to them and to get his/her buy in. In two of the groups where the module coordinators enthusiastically embraced change and led from the front, the changes in assessment practice surpassed the course facilitators' expectations.

The evaluation of the examination paper (Session 3) and asking what purpose a final-year written paper (Session 5) served, demonstrated in a concrete way that the assessment practice of setting recall questions in a final-year paper was not in line with Miller's pyramid where professional authenticity is achieved by 'climbing' the pyramid. It is commonly stated that assessment drives learning (15, 16) and assessment focusing on the recall level can drive surface, rather then deep learning. The concept of constructive alignment is abstract and the exercise in Session 4 helped participants to understand and see the importance of aligning outcomes with assessment and teaching practice. Insight gained by participants from these sessions motivated the change in assessment practice that the facilitators observed.

The training was complemented with support and consultation on an individual basis. The Programme Manager, for example, assisted the module teams who undertook a revision of their study guide with their task.

Conclusion

The staff development initiative in the form of *in situ* assessment training had a positive effect on assessment practice in the School in a relatively short period of time. This is attributed to the needs driven, custom made and active involvement nature of the training.

References:

1. Harden R. Outcome-based education – the ostrich, the peacock and the beaver. Med Teacher 2007: 29: 666-671.
2. Yip H-K, Smales RJ. Review of competency-based education in dentistry. Br Dent J 2000: **189(6)**: 324-326.
3. Gugushe T. Perceptions of curriculum innovation among educators in South African Dental Schools – An explorative study [Dissertation]. Stellenbosch: University of Stellenbosch, 2009.
4. Hendricson W, Anderson E, Andrieu SC *et al*. Does faculty development enhance teaching effectiveness? J Dent Educ 2007: **71**: 1513-1533.
5. Prebble T *et al. Edited by J* Rivers. Academic staff development: A summary of a synthesis of research on the impact of academic staff development programmes on student outcomes in undergraduate tertiary study. New Zealand: Ministry of Education, 2005:6. ISBN 0478132433 Available at: http://trove.nla.gov.au/work/31526511

6. Miller GE. The assessment of clinical skills/competence/performance. Acad Med 1990: 65: suppl(9): S63-S67.
7. Steinert Y, Mann K, Centeno A *et al.* A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education. BEME Guide No 8. Med Teacher 2006: **28**: 497-526.
8. McLean M, Cilliers F, van Wyk J. Faculty development: Yesterday, today and tomorrow. Med Teacher 2008: **30**: 555-584.
9. Aronson E. Jigsaw Classroom. In: http://www.jigsaw.org/index.html, 2000.
10. Gibbs G, (Ed). Improving the quality of student learning. Bristol: Technical & Educational Services Ltd., 1992.
11. Pickard M. The new Bloom's taxonomy: An overview for family and consumer sciences. J Family and Consumer Sciences Educ 2007; **25(1)**: 45-55.
12. Biggs J. Aligning teaching and assessment to curriculum objectives. Learning and support Network Generic Centre, 2003.
13. The advantages of rubrics: Part One in a five-part series. In: http://www.teachervision.com/lesson-plans/lesson-4522.html, 2001.
14. Kramer GA, Albino JEN, Andrieu SC *et al*. Dental student assessment toolbox. J Dent Educ 2009: 73: **12**-35.
15. Wass V, van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. Lancet: 2001: **357**: 945-49.
16. Shumway JM, Harden RM. The assessment of learning outcomes for the competent and reflective physician. AMEE Guide No 25. Med Teacher 2003: **25**: 569-584.