

Students' approaches to learning and perceptions of assessment in a non-summative context

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Abstract

Background: As a deep approach to learning is related to high-quality learning outcomes, assessments need to encourage students to adopt the same. **Aim:** This preliminary study was undertaken to determine the first-year dental students' perceptions about a Medal examination in Physiology that invoked use of a deep approach to learning and to infer their approaches to learning. **Materials and Methods:** Based on their performance in a first-phase multiple-choice question-based test, 10 students were selected from a batch of 84 students. 7 of the 10 selected students attended the final phase of the examination in which, case-based, structured essay type questions were employed. Open-ended, written feedback on their experience of the final phase was submitted by 5 students. **Results:** The perceptions of 5 of the 7 students who attended the final phase were appreciative of an assessment which invoked a deep approach to learning. **Conclusion:** The students' appreciation of an assessment that invokes a deep approach to learning in a non-summative context is significant in the context of learning behaviours.

Keywords: educational assessment, learning, perceptions

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Introduction

Assessment is a 'many-splendoured' pedagogical tool. While conventional methods primarily serve to measure outcomes of learning, there is another aspect to assessment that educators cannot afford to lose sight of – its use as a tool to motivate, support and guide learning.¹ Research in approaches to learning is relevant as there appears to be a relationship between the *process* of learning and the *products* of learning.²

Ground-breaking experiments by Marton and Säljö have shown that students employ two qualitatively distinct approaches to learning: deep and surface.³ The surface approach to learning is exemplified by rote learning, i.e., unreflective memorization, with restricted conceptual understanding.⁴ Conversely, a deep approach involves critical exploration of the learning material in order to grasp the concepts. A third category – the strategic or achieving approach to learning – was later added to describe the approach of students who organize learning specifically to obtain high grades in

assessments.⁴ Strategic learners choose between a deep or surface approach depending on what suits their circumstances.

A deep, strategic approach is related to high-quality learning outcomes.⁵ Moreover, good teaching has been defined as the encouragement of a deep approach to learning.⁶ Therefore, it is implicit that approaches to learning can be modified by the teaching and learning environment and are not to be viewed as fixed characteristics of individual learners.

Assessment is an integral part of the learning environment and research suggests that it can influence the type of learning that takes place. A deep, strategic approach to studying appears to be associated with high levels of academic achievement only when the assessment focuses on and rewards personal understanding; in instances where this is not the case, surface approaches will likely be more effective.⁷

However, research findings also suggest that it is the students' perceptions of the learning environment that influence how a student learns, not necessarily the context in itself.⁸ Lizzio et al found that students' perceptions of their learning environment were a stronger predictor of learning outcomes at university than prior achievement at school.⁹ It follows, therefore, that how students perceive assessment would impact their approach to learning, regardless of what purpose the assessment is actually intended to serve. This is the context in which the 'hidden' curriculum takes shape. Thus, studies that look at assessments from the students' perspective are necessary to understand the implications of assessment in learning.

While the regular assessment formats may or may not reward a deep approach, with Medal examinations that are intended to recognize exceptional merit, it is absolutely essential to differentiate between students who practice a deep, analytical approach and those who practice rote-learning. The Department of

Physiology in Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research, Melmaruvathur conducted a Medal Examination for first-year dental students in a prescribed two-phase format and the authors of this article took up the task of designing the question papers. A Medal examination is an examination in which the topper is awarded a medal or a prize, the intention being to identify proficiency in the subject, not to decide whether a student passes or fails the course. In this context, the questions that the authors attempted to answer with this paper were:

- 1) Did the first phase of the Medal Examination distinguish students with a deep approach to learning?
- 2) What would the students' perceptions of the assessment format in the second phase be?

The authors hypothesized that if the students who got selected to the second phase of the Medal examination did not habitually use a deep approach, they would be critical of an assessment that required the use of higher cognitive skills and describe it as a difficult exercise. Analysis of the students' reflections on their experience of the assessment would yield observations that could have implications in learning. The aim of this study therefore, was to determine the first-year dental students' perceptions about a Medal examination in Physiology that invoked use of a deep approach to learning from which it was intended to infer their approaches to learning.

Materials and Methods

This study was an inspired offshoot of the institutional initiative to conduct a Medal examination in Physiology for the first-year dental students in a prescribed format. Approvals of the Institutional Ethical Committee and the Scientific Research Committee were duly undertaken.

Announcements regarding the decision to conduct the two-phase Medal Examination in Physiology (which was a first for the BDS course in this institution), the date of the first-phase examination and the adoption of a Multiple-Choice Question (MCQ) format for the same were made one week before the scheduled date. 30 MCQs were prepared by the principal author and individually reviewed by the two co-authors to determine the cognitive level, as outlined in the Bloom's Taxonomy.¹⁰ Pre-testing the MCQs was not considered in this instance owing to issues of confidentiality. Each MCQ carried 1 mark and there were no negative marks for wrong answers. The Item Difficulty Index (IDI)¹¹ for the MCQs at each cognitive level (in %) is presented in the table below (Table 1). In case of a tie, correct responses to three questions with a low IDI were to be given preference.

Table 1: The Item Difficulty Index (IDI) of the Multiple-choice questions (MCQ) used in the first phase of the examination

S. no.	Know-ledge	Compre-hension	Appli-cation	Analysis
1	14	35	19	25
2	27	43	46	29
3	32	27	29	27
4	81	36	19	
5	55	51	46	
6	23	18	36	
7	15	36	10	
8	45	21	21	
9	13	69	32	

IDI = Item difficulty index; MCQ = Multiple-Choice-Question; 9 MCQs each tested knowledge, comprehension and application; 3 MCQs tested analysis; IDI values for each MCQ being expressed as a percentage, the optimal IDI value being 63%¹¹

A batch of 84 students was to attempt the first-phase MCQ paper within 40 minutes. Ten students who scored the highest in this phase were selected to take the final phase of the examination. The date of the final-phase essay examination was announced four days before the scheduled date. Two essays carrying 25 marks each were to be attempted within 1 hour.

The authors had initially announced that the essays were to be written with a clear introduction, body and conclusion, as was the practice in their regular assessments. However, recognizing that the purpose of the examination would be better served by case-based, structured essay type questions, we announced the change in format a few minutes before the examination was due.

Seven of the ten students attended the final-phase examination. Once they had moved on from the examination venue to another department for their regular class, the class representative conveyed the request from the department for open-ended feedback stating that the students write up to 5 lines on their experience of the essay examination and submit their written feedback to the class representative. The authors limited the feedback to open-ended reflections, instead of administering a questionnaire addressing specific aspects of the assessment, to avoid incurring response bias.

The open-ended nature of the feedback and its submission in the absence of any concerned members of faculty were expected to elicit the students' unrestrained, genuine responses. The written responses were perceived as a meaningful representation of their perceptions¹² about a novel, case-based assessment in a non-summative context, with greater significance in the light of the fact that the department had not collected such student feedback earlier.

Results and Discussion

Analysis of the marks scored in the first-phase Multiple-Choice Question (MCQ) paper revealed that 7 out of 84 students (8% of the total attendees) scored 50% or above in the first phase of the Medal examination. The mean score of those who scored 50% or above (there were no outliers – the median score was 53%) was 15.8/30, i.e., 52.6%. Since around 30% of the MCQs tested knowledge at the recall level, the relatively low pass percentage and mean score of the students who passed in the first phase of the examination may be considered a reflection of the predominant number of surface learners in this batch of students.¹³ However, it is important to recognize that students can readily adopt a surface or a deep approach depending on how they perceive the learning context, and most crucially how they perceive the assessment task.¹⁴

Figure 1: Highlights from the students' comments about the final phase of the examination

- *"...very good experience.....I was able to know my reasoning capacity. Thanks for conducting such exams."*
- *"It is better to have questions related to clinical aspects than writing long essays...."*
- *"....made us think a lot....it was valuable"*
- *"I expected essay questions but the exam turned out to be very interesting...made me think differently and made me search for the answers later."*
- *"....amazing....really inspired by the essay questions.... very relevant....awesome experience...."*

It was surprising that all the five students' reactions to the final phase of the examination were appreciative of the exercise (Figure 1). One student's observation even mentioned a behavioural change in that he or she felt motivated to find out the answers after the examination. There was no suggestion of any disappointment over not being sensitized to the format earlier. The lack of any expression of anxiety over how their performance would not

have been helped by the surprise elements is rather interesting. The authors reason here that had the students habitually preferred a superficial or strategic approach, some expression of disappointment would have been likely. Therefore, it is plausible that the students who were differentiated by the first phase examination and appreciated the type of assessment carried out in the final phase were those who practiced a deep approach, considering the research observation that differences in individual assessment preferences were to a relatively large extent related to learning strategies and orientations.¹⁵

This was the first instance where the dental students had attempted an MCQ format in their first-year course. The MCQs had been designed from scratch by the principal author and only 30% of the questions tested knowledge at the recall level; Moreover, 28 of the 30 MCQs had an Item Difficulty Index (IDI) that was lesser than the optimal level, which reflects the difficulty students had in selecting the right answers. In view of the above, it is unlikely that the students would have been helped by a good working memory alone in their performance. However, if it is assumed that the first-phase examination had preferentially selected students with a superficial approach to learning, their appreciation of a novel case-based, structured essay format that they were not familiar with, seems misplaced, considering the principles of deep learning that it invoked.

The students seemed to have enjoyed taking the examination despite being on unfamiliar territory. It is arguable that the absence of a summative context in which a Medal examination is conducted could have contributed to the students' laid-back stance. However, there was nothing to suggest that the students adopted an attitude of comfortable disengagement, if indeed they had felt no pressure to perform in the examination. On the contrary, their reflections speak of an active engagement with the subject, which they found valuable.

The regular summative assessments in the first-year dental course do not feature structured, case-based essay formats. Hence, from the strategic learners' perspective, the usefulness of such an experience in a summative context is debatable. However, the students had not reported any concerns on that account. Another probable explanation for the lack of any doubts about the relevance of the exercise could be that they had grasped the value it has in practice. Three students had noted that they liked the exercise of correlating the given symptoms to arrive at a clinical diagnosis. It is also likely that the question of its relevance was simply overshadowed by their gratifying experience in the just-concluded session and that they might have naturally chosen to write about what had transpired, without concerning themselves with its future significance.

It is to be noted that the two-phase format of the Examination, the number of MCQs/essays, the total marks and time duration for each phase and the number of students to be selected for the final phase were preset by the Academic Cell of the Dental College. The authors' participation was limited to question-paper setting and assessment of the answer sheets, which restricted the choice of methodology to the prefixed framework of the study.

As the study had certain limitations owing to its development in retrospect, the discussion was limited to the plausibility that a deep approach to learning was differentiated by the first-phase examination, on the basis of students' perceptions about the final-phase assessment. Documentation of students' perceptions about the first-phase assessment had not been planned. The authors' inference, though disadvantaged by the small sample size, was supported by the results of the final-phase examination: the median score was 48%, the first quartile was 38% and the third quartile was 64%, i.e., 75% of the students (5 out of 7 students) had scored in the range of 38% to 72%. In view of the high standards set for such

an assessment, the value of the first quartile at 38% is noteworthy, but for the sample size. Therefore, more detailed analyses of further assessments in a larger sample would be necessary to conclusively prove that the first-phase MCQ examination led to the selection of students who regularly practice a deep approach to learning.

In this study, the authors first inferred the students' deep approach from their positive perceptions of the assessment, which their performance was found to support later. Here, the authors concede a creative use of the open-ended student feedback that documented their perceptions of assessment. As it was the students' first exposure to case-based essay questions on the subject, the significance of the students' positive perceptions of the assessment is remarkable.

The authors acknowledge the potential benefits of such an assessment exercise in encouraging a deep approach to learning. A prospective study on the role of assessments in modifying students' approaches to learning would have significant implications in educational research.

Conclusion

This preliminary study has shed light on the students' positive perceptions of assessment in a non-summative context. Their appreciation of the learning involved suggests satisfaction with an assessment experience that invokes application of a deep approach. Positive perceptions of a deep approach-oriented assessment in a non-summative context would be significant in the context of learning behaviours. Learners' satisfaction with assessment methods that encourage a deep approach to learning augurs well for a curriculum which for effective implementation depends both on constructive alignment of objectives, teaching-learning methods and assessments and students' perceptions of the learning environment.

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