

Appraising student performance after assessment modification

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Abstract

The Bachelor of Pharmacy (BPharm) qualification offered at the Tshwane University of Technology (TUT) follows a Problem-based learning (PBL) teaching and learning (T&L) strategy, a popular approach in health sciences education. One of the assessment instruments to measure the success of understanding the knowledge and grasp of the curriculum content is alternative response questions (ARQs), or so called true-false questions. In all the assessment opportunities where ARQs were utilised either as a sole assessment instrument, or as a section in an integrated assessment opportunity, results thus far indicated poor student performance in those particular sections. The objectives of this study were to 1) implement an alternative assessment instrument such as short answered questions (SAQs) in assessment opportunities where ARQs are currently the sole assessment instrument; 2) provide student training in the critical thought process involved to deliver improved performance when answering ARQs; 3) to quantitatively analyse and compare the past and current assessment results to determine student performance outcome relevant to ARQs. The utilisation of ARQs as the primary assessment method for scenario tests may perpetuate inequities. Through consideration of a social justice perspective, the lecturer recognises the inherent biases within such assessment methods and aimed to create a more inclusive and empowering learning environment. The change strategy in this project therefore involved implementing an alternative assessment technique. This strategy aligns with social justice principles by providing equal opportunities for diverse students to exhibit the knowledge they acquired in preparation for and during learning activities and have a fair chance to succeed. A more inclusive and equitable assessment approach that supports students' overall academic growth and enhances student performance is created by integrating social justice principles and implementing a change strategy.

Background and strategy

The BPharm programme follows a modular approach with each module typically concluded within a 6–10 week period. PBL is a student-centred way of teaching and learning where scenario-based collaborative learning is key to this approach. In addition to Tutorials, Practical Skills sessions, Workshops and other learning activities, scenario sessions form a major part of the programme. Students are introduced to ill-structured real life scenarios since year one of their undergraduate studies. Small groups of 8–14 students congregate with a facilitator to support and steer the learning by following a 7-step process. The PBL students then use triggers from the given scenario(s) to define their own learning objectives and report back. After this process is concluded students write an online, on-campus, direct feedback, 20-mark True /False alternative response question (ARQ) test. The scenario sessions are the first time that students are introduced to new concepts in a module and ARQs generally requires in-depth knowledge of the subject matter. ARQs are also included as a component in all formal short written tests that take place during the modules and exams that takes place at the end of the module.

Answering ARQs require a range of cognitive abilities such as knowledge, comprehension, critical thinking and decision-making. The most important aspect of ARQs relates to critical thinking, deemed to be one of the most important qualities a pharmacist must apply on a daily basis. Negative marking is applied to ARQs. Students report that this causes increased stress and anxiety, decreased confidence, risk aversion, time pressure and a negative emotional impact. Some students perceive negative marking as unfair, particularly if they believe the penalty for incorrect answers is excessive. This perception can lead to feelings of resentment and dissatisfaction with the evaluation method. Feedback from students have reflected these negative feelings which is partly the reason why the assessment method was adapted.

The theory of change is a framework that outlines the underlying assumptions and interventions required to bring about a desired learning outcomes or social impact. In the context of shifting assessment practices to enhance student success, the theory of change

helps clarify the rationale behind the need for change. Assessment practices play a crucial role in shaping students' learning experiences and outcomes. By accepting the need for and adopting a theory of change, lecturers can design interventions that align with the desired learning outcomes. These changes were discussed and changed in consultation with a curriculum development practitioner.

Methods and data

A retrospective analysis was done on ARQs included in all tests and exams completed during 2021 and 2022 in the RSE246P (Respiratory System, Ear and Eye) Module. This is a level 2 (2nd year students) 8/9-week module. The module includes 20-mark tests referred to as scenario tests, a section forming part of two short written tests (SWT) (formative assessments) and a section of the end of module exam (summative assessment). For 2023, the first two scenario tests contained ARQs only as was done in prior years to serve as control for this group of students. Before the first short written test was written, ARQ revision /training was done to encourage students to develop their critical thinking skills and attempt to assist them on the thought process to follow when answering these types of questions. The last four scenario tests were modified to an alternative assessment instrument containing only short answer questions (SAQs), indicated in green in Table 1. Table 1 shows the number of marks per assessment that was analysed and included in this study.

Table 1. Weighting of ARQs in short written tests and exams and SAQ introduction

	2021		2022		2023	
	n = 52 students		n = 68 students		n = 70 students	
Scenario test 1	ARQs	20 marks	ARQs	20 marks	ARQs	20 marks
Scenario test 2	ARQs	20 marks	ARQs	20 marks	ARQs	20 marks
Scenario test 3	ARQs	20 marks	ARQs	20 marks	SAQs	20 marks
Scenario test 4	ARQs	20 marks	ARQs	20 marks	SAQs	20 marks
Scenario test 5	ARQs	20 marks	ARQs	20 marks	SAQs	20 marks
Scenario test 6	ARQs	20 marks	ARQs	20 marks	SAQs	20 marks
SWT 1	ARQs	35 marks	ARQs	20 marks	ARQs	25 marks
SWT 2	ARQs	35 marks	ARQs	30 marks	ARQs	25 marks
EOM exam	ARQs	30 marks	ARQs	30 marks	ARQs	25 marks

ARQs = Alternative response questions /True /False questions; SAQs = Short answer questions; SWT = Short written test; EOM = End of Module.

Results and discussion

The summary of results for student percentage achieved in scenario tests is shown in Figure 1. For Scenario test 1 and 2, the performance of all year groups was similar and consistently far below 50%. There are significant differences in the performance of the 2022 year-group and 2021 and 2023 year-groups for Scenario tests 3–6. SAQ papers were implemented for Scenario tests 3–6 in 2023 (indicated in green). The performance for the 2023 year-group was higher for the SAQ scenario tests as compared to the ARQ tests: 38% for the two ARQ scenario tests and 57% for the four SAQ tests.

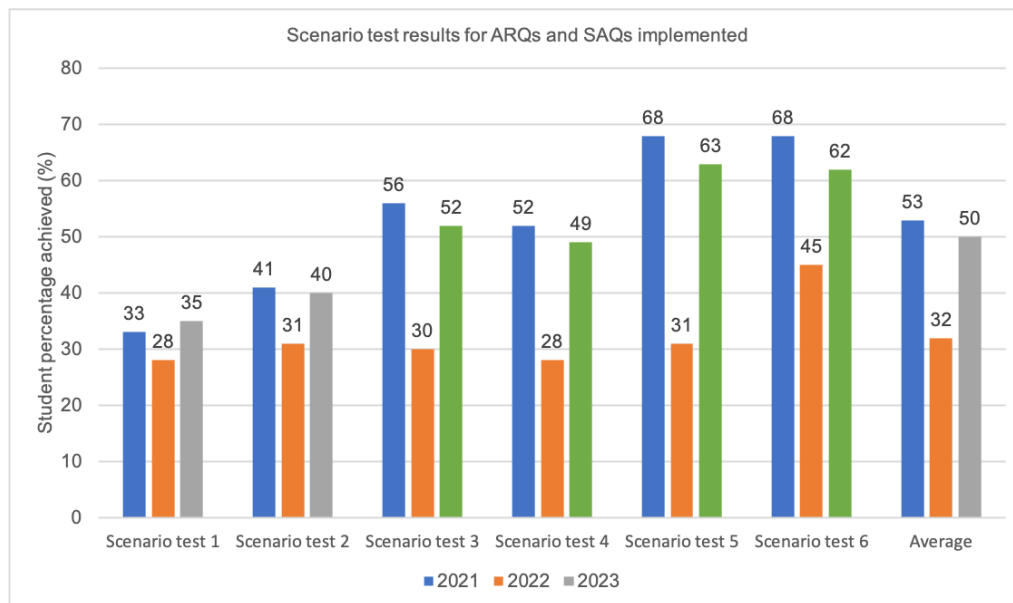


Figure 1. The summary of results for student percentage achieved in scenario tests

Trends in data can lead to identifying and understanding patterns or relationships that may exist in the dataset. To simplify the data and to establish the trend, the student performance in all scenario tests for all datasets were averaged and plotted on a graph (Figure 2) together with the student performance in ARQ scenario tests in 2023 and SAQ scenario tests in 2023. The trend analysis suggests a positive correlation between the variables. In this case the implementation of the SAQ scenario tests and student performance in scenario tests is positively correlated.

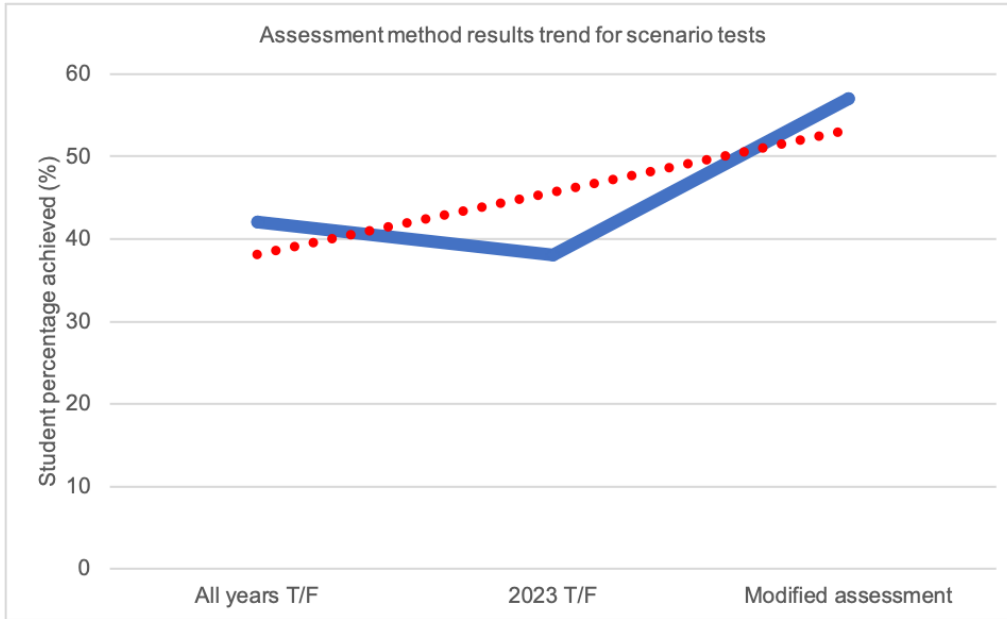


Figure 2. The trend for results of the different assessment methods for all year groups and the 2023 group

The ARQ data analysis summary for short written tests and exams is shown in Figure 3. It is clear that students are not performing well in the ARQ section of short written tests and exams, consistently failing this section for the last three years in 9 assessments, despite training implemented in 2023.

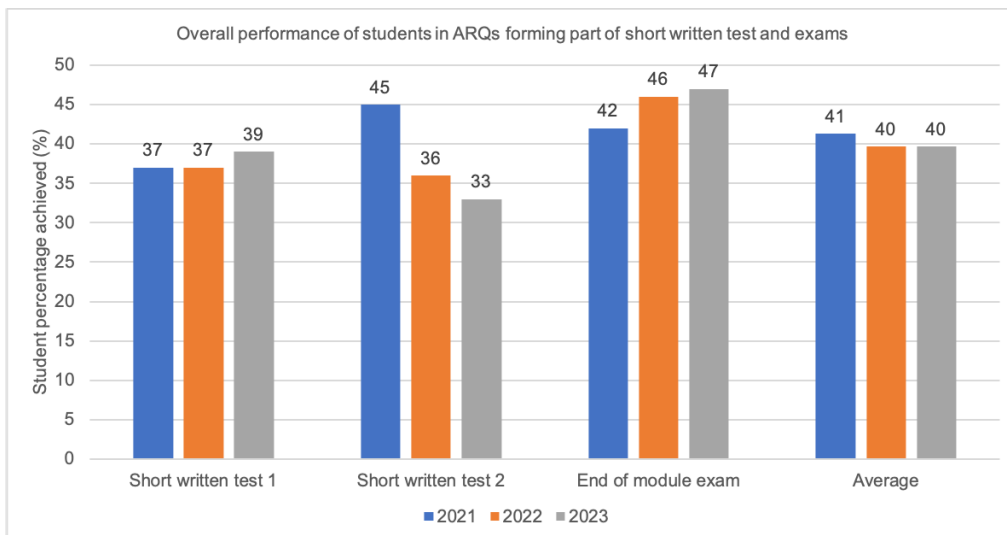


Figure 3. Student performance in the ARQ sections forming part of short written tests and end of module exams

Analysis of process, achievements and challenges

Engaging stakeholders, including a curriculum development practitioner and the students themselves, was crucial for gathering diverse perspectives and generating ideas as part of an educational change strategy. The expertise of a curriculum developed practitioner helps to ensure that the change strategy is grounded in best practices and takes into account curriculum coherence and alignment. By involving students, the change strategy becomes student-centered. Students have a unique perspective on their learning experiences and provide valuable feedback on the existing assessment practices. They share their insights on what assessment methods have been effective for them, and offer suggestions for improvement.

The study embarked on an exploration of the impact of implementation of a different assessment method and assessment training on student performance during the module which is separated into formative assessments which includes scenario tests and short written tests and summative assessments, i. e. the exam. Its primary objective was to assess whether the implementation of these interventions would result in improved academic outcomes. The findings of the study revealed a positive trend in marks following the introduction of the new assessment method (SAQ), indicating that the new approach positively influenced their performance. They also provided positive feedback on this assessment method during module reflection. However, the study also encountered challenges in terms of the training component. Despite the efforts made to enhance critical thinking skills through training, the results did not exhibit substantial improvements in this particular area. This outcome presents a valuable opportunity for future research to investigate alternative approaches that may effectively enhance students' critical thinking abilities in conjunction with the new assessment method.

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