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Progress testing in resource-poor countries: A case from Mozambique

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Abstract

A wealth of evidence for the effectiveness of progress testing in problem-based learning curricula has been collected in the Western academic world, but whether the progress testing can be equally effective in problem-based medical schools in resource-poor countries is a question that remains to be answered. In order to provide an initial answer to this question, we describe our experiences with progress testing in a medical school in Mozambique since its establishment in 2001, specifically focusing on test acceptability, formative educational impact, test validity and test reliability. After 7 years of experience, we think that the conclusion is justified that the progress testing can be a feasible and effective assessment instrument even in a resource poor setting. Institutional collaboration is important to guarantee test quality and sustainability.

Introduction

Although the concept of progress testing has been widely researched and discussed within the Western academic world, the literature offers little information about progress testing in resource-poor countries, such as many countries in Africa, Asia and South America. Medical schools in these countries have to contend with numerous barriers to the introduction of innovations, such as political instability, shortage of teachers and low educational levels of students entering university (Gukas 2007).

The central question we discuss in this article is: in how far is progress testing a feasible and effective method to assess students' knowledge in a medical school in a resource-poor country? We examine this question by looking at various aspects of our experiences with progress testing in a medical school in Mozambique, i.e. Universidade Católica de Moçambique (UCM) medical school.

We will describe how we implemented progress testing in our medical school and the strategies we used to profit from the benefits of progress testing despite our limited resources.

Practice points

- Progress testing has been shown to be a feasible and effective assessment method in a problem-based medical curriculum within the setting of a medical school with limited resources.
- Despite initial opposition to its introduction, the test has come to be widely accepted by students and staff.
- It is possible to implement progress testing using an externally developed progress test format that is adjusted to the local context.
- In order to deal with the organisational and financial challenges posed by progress testing collaboration with other institutions is recommended.

Progress testing at UCM medical school in Beira, Mozambique

Context

In 1975, soon after independence from Portugal, civil war broke out in Mozambique, almost completely destroying the education and health care system. When the peace accord was signed in 1992, Mozambique was among the poorest countries in the world. The private Catholic University of Mozambique (UCM) was founded in 1996, during the aftermath of the war. In 2001, UCM medical school was launched, and in 2007 it produced its first graduates. Today (2010), UCM has approximately 300 medical students from a variety of social-ethnic backgrounds.

From the very start, problem-based learning (PBL) has been the faculty's leading educational approach. The UCM curriculum is based on that of the Maastricht medical school, the Netherlands. Over the years, a wealth of experience in implementing a Western PBL curriculum and adapting it to the local situation has accumulated at UCM. The school's main problems are low educational levels of entering medical students, low budgets and low numbers of faculty staff. With its yearly budget for running costs equivalent to about $500,000, UCM medical school has only a fraction of the budget of the average Western medical school. Also, the academic staff–student ratio of about 1 : 15 is hardly comparable with European or American standards. The introduction

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of PBL in the newly founded Faculty of Medicine created a surge of momentum to tackle the problem posed by students' prevailing learning strategy. As a result of the common approach in the Mozambican educational system, students were conditioned to concentrate mostly on memorisation of facts. Additionally, faculty staff were looking for a method to monitor long-term growth of medical knowledge, for the benefit of both staff and students. So, simultaneously with the introduction of PBL, progress testing was adopted as one of the medical school's main assessment tools. As the curriculum and its end objectives are largely based on those of Maastricht Medical School, it was feasible for UCM to use the progress tests in the same format as the Maastricht progress test. In 2001, we started with the help of Maastricht faculty, a progress test based on the test blueprint of Maastricht (Van der Vleuten et al. 1996; 2000).

The progress test

Test preparation. Over the years, we adjusted the test blueprint. Categories that were not relevant to the UCM curriculum or represented cultural bias were removed (8–10%) and replaced by categories about infectious diseases and about PBL methods. Because of the high prevalence of infectious diseases in Mozambique, this aspect of medicine requires more emphasis in the curriculum and progress tests. When we started in 2001, we could make use of old progress tests from Maastricht. Bi-lingual faculty staff translated the questions from Dutch to Portuguese. After the initial translation, the items were reviewed by the progress test committee, composed of faculty from the main areas of medicine. Nowadays, the test is constructed by re-using test items from the several thousands that are available in our item bank and by writing new questions. New questions are written by faculty of the relevant departments. All questions are checked for content and wording and have to be approved by the progress test committee.

Test administration. Students have to pass two of the four annual tests that are administered to all students in years 1 through 6 of the curriculum. Initially, test time was 3 hours for 200 items, but this has been extended to 4 hours due to the fact that a section of the students were not able to finish the test in the given time. Afterwards, students can take the test items home with them and the correct answers are published on a bulletin board immediately after the test in order to provide feedback.

Test scoring and quality control. After the test, item characteristics (*p*-values and item-rest correlations) and test reliability are calculated. Students have three working days to hand in documented evidence of flaws in test items, and many students do so. Test items can be removed when this is warranted based on students' well-founded comments and item characteristics. The final results are usually published in 2 to 4 weeks after the test, together with written answers to students' objections. After a few years of experience with progress testing, the faculty set up annual training in item writing and reviewing for staff involved in assessment in order to improve the test quality and guarantee future sustainability.

Nine years of experience with progress testing at UCM Medical School

Our experiences have taught us that the locally adapted progress test fits quite well in our curriculum. The system of allowing students to keep the test and challenge items, together with the statistical analysis of item characteristics affords an excellent insight into the relevance of the questions for our students. Generally, only a small percentage of test items (mostly 3–5 per test) have to be removed. The overall reliability of the tests is quite acceptable: the first three progress tests of 2009 had reliability coefficients between 0.78 and 0.87 with a mean of 0.83, which meets the 0.8 required for high stakes assessment (Magnusson 1967).

Our experience has taught us that the progress test is a feasible test for our school. Because we can make use of an item bank and only have to develop a relative small number of new test items, test construction is not a burden to our staff. Also, we do not have to invest in special test software, because regular text processing software (Word) is used for test production and item banking, and for item analysis regular software (Excel) is also quite effective.

Acceptance. At the time of its introduction, resistance to progress testing was strong largely due to both teachers' and students' lack of previous experience with this type of testing. Information and discussion sessions with student representatives were organised to explain the concept and format of the test. The test was made summative after the first few tests had been given. By then, it had become clear that the faculty was able to deliver tests of sufficient quality to overcome the initial scepticism. Overall acceptance by the students grew over time as they got used to the concept of progress testing. This happened especially when senior students, having gained awareness of their growth in knowledge after several years of progress testing, informally introduced the concept of progress testing to their junior fellow students. Students entering the faculty are offered training to introduce progress testing. Senior students whose test results are unsatisfactory are offered additional progress test training.

We know from interviews with student representatives and from our own experience that currently the majority of the students are pleased with the test and use their results to monitor how their knowledge growth is progressing.

Feedback for students and the curriculum. The progress test appears to be a rich source of feedback for both students and faculty. Because of their low educational level on entering medical school, many students are insecure about their knowledge. Most students calculate their personal results per category to identify areas requiring improvement and then perform a literature search to study these topics. Especially the higher scoring students compare their results with those of their peers, which we make available to them. Since the competitive students know that their curriculum and progress

tests are based on Western standards, they often show curiosity to compare their results.

In areas where all students were found to perform poorly, the curriculum has been revised. In 2007, for example, a new block on anatomy, physiology and pharmacology was constructed for the second-year students after it had been noted that progress test results in these fields were lagging behind the results in other fields. Test items about high-technology genetics and molecular biology have frequently been removed either before or after a test. This reflects the lack of availability of such techniques in Mozambique medicine.

Discussion

This article is a reflection of 9 years of experience with progress testing in a faculty with poor resources. Not only has the progress test we use proven to be a reliable and feasible assessment instrument for knowledge testing in PBL, it is also generally appreciated by students and staff. During the last 9 years, we have been able to reap the benefits of progress testing, such as prevention of test-directed studying and a rich source of feedback for our students and staff.

Our progress test is originally based on the Maastricht progress test, which we adapted to the local context. The presence of bilingual (Dutch–Portuguese) staff at UCM medical school was crucial for this process. Given our staff shortage, producing four progress tests per year, completely consisting of new questions would be well beyond our reach. We therefore use both newly written questions, and re-used test questions from our existing item bank. A possible future solution for test construction would be to seek institutional collaboration for test construction with other Portuguese speaking medical schools. Institutional collaboration in developing test formats like the progress test can provide economic benefits for the participating institutions and allow a focus on high quality assessment (Van der Vleuten et al. 2004; Verhoeven et al. 2005). Such collaborations have already been successfully set up and are being expanded in Germany, The Netherlands and the United Kingdom, (Van der Vleuten et al. 2004; Muijtjens et al. 2007).

Although progress testing in a resource-poor setting poses additional demands in terms of organisation, staff and finances, the progress test is widely accepted within UMC and has definitely proven a feasible and effective assessment instrument that is congruent with our PBL curriculum. The key strategies that we have used to achieve successful implementation are: overcoming initial resistance in close collaboration with students, collaboration with motivated staff and continuously adapting the test to the evolving curriculum and local circumstances. It is our opinion that, provided efforts are made to implement such strategies, a resource-poor setting poses no insurmountable barriers to educational innovation in general and to progress testing in particular. As for future challenges to successful continuation of progress testing at UCM faculty of medicine, we think that institutional cooperation with other Portuguese speaking medical faculties in similar settings could promote future quality and sustainability.

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References

Gukas ID. 2007. Global paradigm shift in medical education: Issues in concern for Africa. Med Teach 29(9):887–892.

Magnusson D. 1967. Test theory. Stockholm: Addison-Wesley.

Muijtjens AMM, Schuwirth LWT, Schotanus JC, Van Der Vleuten CPM. 2007. Origin bias of test items compromises the validity and fairness of curriculum comparisons. Med Educ 41:1217–1223.

Van der Vleuten CPM, Driessen EW. 2000. Toetsing in probleemgestuurd onderwijs (assessment in problem based learning). Groningen: Wolters-Noordhoff.

Van der Vleuten CPM, Schuwirth LWT, Muijtjens AMM, Thoben AJNM, Cohen-Schotanus J, Van Boven CPA. 2004. Cross institutional collaboration in assessment: A case on progress testing. Med Teach 26(8):719–725.

Van der Vleuten CPM, Verwijnen GM, Wijnen WHFW. 1996. Fifteen years of experience with progress testing in a problem based learning curriculum. Med Teach 18:103–109.

Verhoeven BH, Snellen-Balendong HAM, Hay IT, Boon JM, Van Der Linde MJ, Blitz-Lindeque JJ, Hoogenboom RJI, Verwijnen GM, Wijnen WHFW, Scherpbier AJJA, et al. 2005. The versatilty of progress testing assessed in an international context: A start for benchmarking global standardization? Med Teach 27(6):514–520.