
Mapping University Mathematics Assessment Practices

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Chapter 9

Continuous Assessment in a History of Mathematics Module

Abstract This case study presents the assessment structure for a third year history of mathematics module. Assessment includes a variety of methods such as essay writing, peer-assessed posters for mini-projects and the solution of a mathematical question with the appropriate historical tools. The course aims to improve students' understanding of mathematics as a product of history and culture as well as to improve their essay-writing and communication skills.

9.1 Background and rationale

This module is team-taught by three lecturers. They designed the assessment schedule for this module both because of their interest in the history of mathematics and essay-writing and because they felt that students would welcome the opportunity to experience a variety of assessment methods in their third year. The lecturers felt that in this way the students would engage with some mathematical content, but also would practise essay writing, team working and presenting ideas through posters. These skills, they feel, are important in the workplace and are not practised enough in mathematics degrees.

9.2 Implementation

The module in its current form is divided in three parts - ancient Greek mathematics, the development of calculus and the history of statistics - each taught and assessed by different lecturers. For each part of the module students work on the historical development of a branch of mathematics. For example, the students will study Cauchy's development of a rigorous basis for calculus and Galois' work in algebra. There is a wide variety of assessments in the module. Students undertake two essays which focus on a historical topic, but are also expected to include some mathematics. They also work in small groups (of around 5 students) to prepare a poster on a topic and to peer-assess other groups' posters on visual impact, clarity, scope and use of references. One of the lecturers assesses his component by setting traditional-looking mathematics questions which require the use of the mathematics of the day: for example, requiring students to solve a calculus-type problem using the methods Huygens developed before Newton and Leibniz.

The key advantages of these forms of assessment appear to be that students practise transferable skills such as essay writing and communication, as well as engage critically with the historical development of mathematics. The main lecturer believes that essay writing is a very important skill for students to have, independent of what job they will take after graduation. He also feels that the nature of these forms of assessment means that all students can engage: sometimes in an examination, it was felt that some students simply could not do anything and failed very badly.

However, with this assessment scheme the students sometimes raise concerns about the group work being awarded a single mark for everyone in the team when they perceive that not everyone contributed equally. Some also feel that there is too much assessment in one module.

9.3 Assessment

Stage	No. of students	Assessment pattern
Year 3	55	40% essay 60% coursework (20% essay, 20% peer-assessed group poster, 20% mathematical problem)

9.4 Discussion, learning and impact

Staff noticed substantial improvement between the first and the second essay, in terms of how students conceptualised the written work, on the reference style employed and on their ability to focus on the topic. The main lecturer reports that there was a significant increase in marks and a mark distribution that is not typical of mathematics modules. Marks last year were gathered at the top and the bottom of the spectrum; many students achieved high marks and there were no fails. The lecturer believes that for mathematics this pattern of marks is unusual. However as this is not a typical module in mathematics, this unusual pattern was not perceived to be a significant problem. The lecturer also describes how students engaged with this module and believes that many did not do enough to read independently around the topic for the essays, which he would have expected them to do. He believes that this is because in mathematics independent study has a rather different shape than in history and students were not used to this. On the whole the lecturer is satisfied about how the module ran and plans to offer it in the coming years in the same form.

Mapping University Mathematics Assessment Practices
Published 2012.
University of East Anglia
ISBN 978-1-870284-01-1

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