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# Mapping University Mathematics Assessment Practices

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*Edited by*

Paola Iannone  
University of East Anglia

Adrian Simpson  
Durham University



## Chapter 14

# Mini Projects and Library Tasks

**Abstract** This case study presents the assessment strategy of a third year module called *Information Skills in Mathematics*. The assessment consists of using three distinct tasks – including a mini project – aimed at enhancing students’ research, communication and presentation skills.

### 14.1 Background and rationale

*Information Skills in Mathematics* is a module assessed entirely by coursework, which has run for 6 years. It was developed in response to an external review which recommended that all students undertake at least one project in their undergraduate year. Aimed at enhancing students’ employability skills, the module is now assessed by three separate tasks. The tasks assess not only mathematical content, but also transferable skills such as mathematics word processing, independent research, and written and oral communication skills.

### 14.2 Implementation

The module is divided in three parts. First, students learn  $\LaTeX$  and have to submit a  $\LaTeX$  assignment. The second part covers library skills: for this, students select a topic from a given extensive list and are required to find 2 books, 3 journals articles and 4 web resources relevant to the chosen topic. They are then asked to evaluate the sources and write an essay no longer than 2000 words. This task teaches students how to do a literature search on a mathematics topic and how to use the library resources appropriately. The third task is the mini-project. This consists of reading and reporting their understanding of one research article in mathematics. Each student is assigned a different research article (there are 130 different articles on the list). Examples of such articles are:

*Multiplicative groups of singular matrices* B. Lang and H. Liebeck, *Mathematical Gazette*, (60), 1976, 38-47.

*Abstract:* In a group every element must have an inverse. So it would seem at first sight that in a group of square matrices, all the matrices must be invertible, i.e. they must be non-singular (with non-zero determinant). However, this isn't so.

*The two-state Markov process and additional events* L.Rade, *American Mathematical*

Monthly, (83), 1976, 354-356.

*Abstract:* This is the famous method of interpreting the Laplace transformation in Probability, on one of the simplest models of continuous time Markov chains.

For the mini project each student is assigned to a supervisor (the member of staff who suggested the paper in the given list) and they meet three times during the semester for between half an hour and an hour each time. The final report is expected to be 5 to 10 pages long and the students present the project in a 5 minute presentation. The student's supervisor assesses the mini projects. The projects are submitted through the Turnitin software which helps detect plagiarism.

The key advantages of this assessment schedule is that it allows students to engage with a piece of research in mathematics with the final mini project while at the same time it helps them develop employability skills such as written and oral communication, synthesising and evaluating sources and specialised word processing. The possibility has been discussed of replacing some parts of the  $\text{\LaTeX}$  section of the course with an aspect of industrial mathematics in future.

### 14.3 Assessment

Stage	No. of students	Assessment pattern
Year 3	100	15% $\text{\LaTeX}$ assignment 25% library assessment 60% mini project and presentation

### 14.4 Discussion, learning and impact

On the whole, students engage enthusiastically with this module and its assessment structure, although the lecturer interviewed believes that many students see it as an easy module. The lecturer also reports that the marks students gain on this module tend to be higher than for other mathematics modules. This may be because supervisors are too lenient when marking the mini projects and the presentations and do not take sufficient account of the fact that some mathematics topics suggested for the projects are more complex than others. The difficulty in assessing the written mini project has been partially overcome by the presentation which gives the assessors a better indication of the students' level of understanding. The drawback of this assessment schedule is the complexity of its administration. Coordinating many supervisors and a cohort of 100 students is very time consuming. Similarly, there is a heavy assessment load: the mark comes from averaging 2-3 different evaluations of each project.

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