

## **CETL-MSOR Conference 2015**

### **Caitriona Ní Shé, Sinéad Breen, Connor Brennan, Frank Doheny, Fiona Lawless, Ciarán Mac an Bhaird, Seamus McLoone, Eabhnat Ní Fhloinn, Brien Nolan and Ann O'Shea: Identifying topics and concepts that First Year students struggle with in Mathematics**

It has been recognised that the transition from secondary to tertiary Mathematics is problematic for many students. Evidence has shown that many students grapple with first year mathematics, in particular the transition from rote learning to independent thinking.

As a result we are undertaking a large-scale project, funded by the National Forum for the Enhancement of Teaching and Learning in Higher Education in Ireland, concerning the development of formative assessment techniques in order to improve the teaching and learning experience of first year undergraduate mathematics modules.

As part of this project, we aim to identify mathematical topics and concepts that are problematic for first year undergraduate students in Higher Education Institutions (HEIs) in Ireland, develop online activities and tasks to promote understanding of these concepts, and evaluate the effectiveness of these resources.

In order to identify these concepts, two surveys were developed: one aimed at students and another at lecturers. A total of 460 students, attending mathematics modules in Athlone Institute of Technology (AIT), Dublin City University (DCU), Dundalk Institute of Technology (DKIT) and Maynooth University (MU) completed the student survey in the spring of 2015. Most of the students were just finishing their first year in higher education. A small number (circa 20) were at the end of their second year.

Students were asked to rate their ability to both understand and do 23 different question types. These questions were selected by members of the project group who are all teaching first year undergraduate mathematics. The survey also contained a number of open-ended questions to ascertain which topics caused the students most difficulty, what types of resources they currently use and what other types of resources they would like to be made available to them.

The second survey was carried out to ascertain the main topics and concepts that mathematics lecturers identify as being problematic for students in first year courses, the types of resources that are already in use in relation to these topics and how they are disseminated. 32 responses were received from mathematics lecturers across all HEI's.

The results of these surveys will be presented, with particular focus on the differences and similarities between the responses of students and those of their lecturers. A comparison of responses from students with different mathematical backgrounds will also be made.