ADAPTIVE ASSESSMENT FOR DIFFERING MATHS BACKGROUNDS?

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ABSTRACT

We report upon a work in progress: an attempt to use adaptive features of online mathematics homework system *MapleTA* to address educational challenges associated with diverse backgrounds of students in a large first year mathematics course. The course is both a service course taken by several hundred Engineering and Science students, as well as the first course for a significant proportion of Bachelor of Mathematics students. Our rationale for the *MapleTA* assignments is that students of different backgrounds learn mathematics at different speeds: this is difficult to cater for in a didactic lecture, but may be better addressed in online homework which is structured to give varying levels of scaffolding depending upon the live responses of each individual student.

Our medium-term hope is to use such assignments as the basis for a "Flipped Classroom" approach, in which students first encounter course material outside of class time, and then class-time is used to discuss and digest those aspects students are finding difficult. Our approach is supported by the literature, which shows that active learning contexts and Computer Assisted Instruction (CAI) can both be helpful in promoting learning and improving retention, but that they need to be implemented carefully. Our current implementation is of partially adaptive assignments that are run in addition to largely didactic lectures. We will also briefly discuss our use of multiple-choice "card questions" as adapted from the "Peer Instruction" work of Harvard Physicist Professor Eric Mazur, to promote more discursive mathematics lectures. The focus of the presentation will be upon the *MapleTA* assignments themselves and the degree of adaptivity that we have been able to implement thus far, together with a description of some of the practical pitfalls along the way, for those interested in trialling a similar approach.