The Implementation of Graphics Calculators in a Large First Year University Unit

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Abstract

In this paper we describe the implementation of graphics calculators as teaching and learning aids in a large first year university mathematics unit. This unit is a core unit in the Computer Science and Engineering programmes. The content of the unit includes vectors, matrix and complex number arithmetic, analytical geometry and systems of linear equations. Graphics calculators provide the best means of a student performing the required calculations quickly and efficiently, permitting the consideration of more realistic problems without a large computational burden. In 1999 for the first time students in this unit are expected to use a graphics calculator for all their calculations. However students have a wide range of calculator skills, from school leavers with a minimum of two year's experience with a graphics calculator to mature age entrants with little or no calculator experience. With such a diverse student background and permitting student use of a range of makes and models of graphics calculators, there are problems of equity of student access to the technology, practical problems of instruction in a large tutorial class and problems of ensuring examination fairness. A pilot programme in 1998 with a small number of students using Hewlett Packard HP 38G graphics calculators enabled resources to be developed and tested. This paper describes the development of a calculator policy and a set of non-model specific graphics calculator notes and exercises used to address these problems. The usefulness of these resources and the effectiveness of the implementation at each stage were assessed with student evaluation questionnaires.