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Blended learning in mathematics support

Key Words

student learning, mathematics, blended learning, mathematics support

Abstract

There is a push in universities for teachers to produce online or blended learning resources for their students to either complement or replace the traditional ways of teaching. The types of online and blended learning resources in mathematics range from MOOCs to short videos – screencasts or mathcasts as they are called in the literature – on mathematical topics. The Mathematics Learning Centre (MLC) has produced screencasts to complement the maths bridging courses and for two units of study. There are currently 89 videos in total. The literature suggests that screencasts are valued by students for their clear explanations of mathematical concepts, the fact that they 'allow students to learn at their own pace' and, in a unit of study context, that they go over the mathematical ideas presented in class, hence reinforcing those ideas, (Loch, Jordon, Lowe and Mestrel, 2012 page 257). However, video is essentially a passive medium, and may not encourage meaningful mathematics learning. Mathematical capacity is acquired and mathematical thinking is developed through doing mathematics. By itself, passively listening or watching others do mathematics 'is in actuality no learning' (MacGillivray, 2008 page 470). This idea is self-evident to mathematicians and was elegantly expressed by the famous mathematician Paul Halmos: 'For a student of mathematics to hear someone talk about mathematics does hardly any more good than for a student of swimming to hear someone talk about swimming.' Halmos, Moise and Piranian (1975) page 466 Furthermore, communicating mathematics effectively to a student who is under-prepared mathematically for their studies -– the MLC student – is a complex and difficult task involving a continual assessment of the student's understanding. This is best accomplished in the student's presence. Goodyear (2007 page 95) argues that co-presence (face-to-face) interaction 'is "thick" with information, for example body language, gesture and silence'. He goes on to argue that face-to-face allows for 'fluent timing of turn taking' and the 'efficiency and flexibility of "loose talk" allows rapid topic identification and shifting between topics' — 'good for arriving at outcomes for which there is no script' (page 95). In this presentation, we argue that for MLC students, and perhaps for most mathematics students, face-to-face interactions are essential to discern a student's understanding of mathematical concepts and to move students from being spectators to active participants in their mathematics learning. Students must get a chance to contextualise new mathematical ideas in terms of their own thought processes and these may be very different than the standard techniques and methods used in the template methods presented online. We argue that blended learning resources should, therefore, complement rather than replace face-to-face programs and by relying too heavily on online materials even to demonstrate quite specific skills, we may be denying students a deeper and broader understanding of the core concepts and ideas of mathematics. We will provide examples of how we have used screencasts to support our students' learning and will discuss a new research project to determine their effectiveness.

References

Goodyear, P. (2007). Technology and the articulation of vocational and academic interests: reflections on time, space and e-learning, Studies in Computer Education, 28(2), pp 83-98.

Halmos, P., Moise, E. & Piranian, G. (1975). The problem of learning to teach, The American Mathematical Monthly, 82(5), 466-476.

MacGillivray, H. (2008). Learning support and students studying mathematics and statistics, International Journal of Mathematical Education in Science and Technology, 40(4), 455-472.