International Review of Economics Education 16 (2014) 156–169

Contents lists available at ScienceDirect

International Review of Economics Education

journal homepage: www.elsevier.com/locate/iree

Evaluating the impact of a web-based resource on student learning☆

Matthew Olczak *

Economics and Strategy Group, Aston Business School, Aston University, Birmingham B4 7ET, UK

ARTICLE INFO

Article history:
Received 20 February 2013
Accepted 21 October 2013
Available online 19 November 2013

JEL classification:
A20
A22

Keywords:
Web-based resource
Computer assisted assessment
Self-selection bias

ABSTRACT

This paper reports on an experiment of using a publisher provided web-based resource to make available a series of optional practice quizzes and other supplementary material to all students taking a first year introductory microeconomics module. The empirical analysis evaluates the impact these supplementary resources had on student learning. First, we investigate which students decided to make use of the resources. Then, we analyse the impact this decision has on their subsequent performance in the examination at the end of the module. The results show that, even after taking into account the possibility of self-selection bias, using the web-based resource had a significant positive effect on student learning.

1. Introduction

In the mid 1990s undergraduate economics teaching in the US was, according to the survey results of Becker and Watts (1996), dominated by 'chalk and talk' teaching methods with little innovation and very limited use of technology. A follow-up survey in 2000 (Becker and Watts, 2001) suggested that little had changed, despite more attention being dedicated to teaching. However, recent evidence suggests that the use of technology is now becoming a more common means of enhancing the student learning experience. When Becker and Watts (2008) repeated their survey in 2005 they found more evidence of innovation and use of technology. Likewise, survey evidence from economics lecturers in the UK shows a significant recent increase in the adoption of technology.[1] However, despite this

☆ I would like to thank Catherine Foster and Chris Jones for help collecting the data and Nigel Driffield, Helen Higson, David Saal, Anne Wheeler, an anonymous referee and participants at the 2011 DEE Conference and the 2012 ABS/HEA L&T Conference for their helpful comments on an earlier draft.

* Tel.: +44 1212043107.
E-mail address: m.olczak@aston.ac.uk.

[1] See http://www.economicsnetwork.ac.uk/projects/lec_survey2005.pdf, pp. 8–10 (accessed 11/01/13).

1477-3880/$ – see front matter
http://dx.doi.org/10.1016/j.iree.2013.10.008

increased adoption of technology, there remains limited and inconsistent evidence on whether this has a positive impact on student learning (see Section 2). This paper contributes to the available evidence by analysing which students decide to make use of a technological innovation and how this then impacted on their learning.

The paper evaluates the impact of increased use of technology in a first year introductory microeconomics module taken by over 400 business school students. Motivating and engaging students on this module is particularly difficult because class sizes are large and whilst some students are experiencing economics for the first time, others have considerably more experience of the subject. However, engaging these students is arguably of particular importance since a number of threshold concepts are introduced and, according to Shanahan et al. (2006, p. 30), act as 'a portal which, when crossed by the learner, grants access to a previously inaccessible way of thinking.' Furthermore, Rhodd et al. (2009) provide evidence that performance on principles of economics courses has an important effect on overall degree achievement and result, due to common methods of understanding, in spillovers on related non-economics courses.

In an attempt to increase student engagement we experimented with introducing a web-based resource (WBR) into our teaching of this course. Such online resources are a rapidly developing part of the economics textbook market (Lopus and Paringer, 2012). The MyEconLab resource[2] we introduced was provided by the publisher alongside the course textbook (Sloman and Wride, 2009). Throughout the course we used the WBR to make available to all students a series of optional practice and revision quizzes. Whilst these quizzes did not count towards the module assessment, we tried to provide clear incentives to use the resource. This was done by guaranteeing that a number of the multiple choice practice questions would be replicated in the exam at the end of the module which, for administrative reasons, was the only form of assessment.

The WBR was the only way in which students could access this practice material. Whilst this is clearly not the only means to provide students with such practice material, there are a number of benefits from providing them in this way.[3] First, the WBR provides a wide range of practice questions (in Section 6 we discuss how this is especially useful if the WBR is also used for assessment) and also includes many other supporting materials to complement the textbook material. Whilst there are a large number of multiple-choice type questions, other question formats are also provided, including questions which provide practice in drawing and interpreting graphs. Second, the WBR enables students to receive rapid and detailed feedback and in addition an individual study plan is generated for each student based on the areas which they have found difficult. Finally, instructors are able to easily identify and respond to areas students are finding difficult to understand. Overall, consistent with learning theory (see Simkins, 1999, pp. 278–280), we hoped that introducing the WBR would enable the students to become more active in the learning process with increased opportunities to check their understanding of the lecture material and lead to improved performance in the module. On the other hand since students have a variety of learning styles (see for example Biggs and Tang, 2007, pp. 8–30) the WBR may, therefore, not appeal to all students and our analysis will also identify such students.

There were two ways in which students could obtain access to the WBR. First, an access code was provided with a purchase of the course textbook. However, we could not require all students to purchase the textbook (which was nevertheless also available from the library). Therefore, second, in order to provide access to the resource to students who were not willing or able to purchase the textbook, the business school purchased additional access codes. These were made available to all of the students at the start of the module and for a limited period towards the end of the module.[4] In total

[2] http://myeconlab.mathxl.com/login_econ.htm (accessed 11/01/13). For an overview of how MyEconLab can be used to support teaching and the range of resources provided see: http://www.youtube.com/watch?v=3ATftP0YDRY&context=C347e269ADOEgsToPDskIn37_-KI1m5f8oUpt164DY (accessed 11/01/13).

[3] See also for example Chalmers and McAusland (2002) and Pollock et al. (2000) for a discussion of these and other potential benefits of computer assisted learning and assessment, including: making sure that students cover all of the course topics, allowing students to work at their own pace, improved retention rates and time savings on setting and marking assignments. They also suggest that students are generally in favour of this form of assessment.

[4] These codes provided access to an identical resource except for no access to the e-book version of the textbook.