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Goal Setting and Implementation Intentions to Improve Educational Outcomes

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Abstract

The success of any student's engagement with an educational programme is inherently determined by the student's own learning behaviour. This paper presents an overview of a project that seeks to break new ground in creating a nexus between the research areas of behavioural economics, the economics of education and pedagogy. Across institutions and subjects, educational outcomes can be improved by nudging student behaviour towards deeper and structured learning approaches to improve educational attainment. This project consists of a field experiment conducted in an introductory undergraduate module at a UK university to test whether goal setting and implementation intentions can improve student engagement with learning material, student wellbeing through earlier preparation for assessment, and student academic attainment. In the context of an increasing financial burden faced by students in higher education, increasingly resource-aware universities and a much more diverse student population, behavioural nudges offer a unique and powerful opportunity to support students to be better learners and, as a result, the opportunity to improve student attainment.

Introduction

The success of any student's engagement with an educational programme is inherently determined by the student's own learning behaviour. This project will break new ground in creating a nexus between the research areas of behavioural economics, the economics of

education and pedagogy. For any budget, educational outcomes can be improved by nudging student behaviour towards deeper and structured learning approaches to improve educational attainment. This project will consist of a field experiment conducted in an introductory undergraduate module at a UK university to test whether goal setting and implementation intentions can improve student engagement with learning material, student wellbeing through earlier preparation for assessment, and student academic attainment. The results of this project have enormous potential for dissemination across a wide audience across the research areas of experimental, behavioural and educational economics, with significant pedagogical contributions relevant to course designers. The behavioural intervention is designed to be implemented with minimal resources with large scalability, and has the potential to significantly affect student engagement, which is of practical relevance to educational providers throughout the world. Moreover, the marginal effect can be expected to be higher in deprived areas or with students who may lack the soft skills required to plan their self-directed learning activities accordingly. Ultimately, this synthesis of behavioural economics and pedagogy has the potential to be of significant benefit to learning providers, students engaged in learning, and the wider academic community.

Literature Review

This project seeks to break new ground in combining behavioural interventions with pedagogical literature in the context of higher education. A student's observed engagement in a learning activity is significantly determined by the student's motivation and preferences. Moreover, even if a student intends to take part in a learning activity, they may lack the self-control skills necessary to carry out their intentions. This creates the potential for significant losses in the investment in higher education, particularly for socioeconomically disadvantaged students who may lack these soft skills or who may require to be engaged in paid employment to fund their studies, creating a strain on time resources.

Whilst there is a significant body of pedagogical literature that seeks to encourage student engagement in learning activities by considering their design (e.g. Gilboy et al., 2015), behavioural nudges provide a low-cost, high-return and more importantly – widely missing – opportunity to address the problems of student engagement. This project seeks to test the impact of goal setting ('how many or which activities I task myself with completing) and implementation intentions ('when I will complete these activities by, and in what order') nudges in the context of a field experiment in the UK higher education sector, where the problems of student engagement and lack of resources are widely acknowledged.

This project builds on the work by Clark et al. (2016) in using goal-setting as a motivational tool by incorporating implementation intentions that have been particularly successful in the field of health interventions (Gollwitzer & Oettingen, 2015; Milkman et al., 2011; Stadler et al., 2010). This combination of goal setting and implementation intentions may provide a more effective behavioural intervention in motivating students to complete learning activities in terms of completion rate, but also with respect to the scheduling of learning activities. Given that student wellbeing is of utmost importance, students who can be nudged towards earlier and sustained self-directed study should be less likely to engage in the more stressful and less effective learning strategy of cramming.

In the context of an increasing financial burden faced by students in higher education, increasingly resource-aware universities and a much more diverse student population, behavioural nudges offer a unique and powerful opportunity to support students to be better learners and, as a result, the opportunity to improve student attainment. There are also implications for how educational providers can harness the power of learning analytics from learning management systems to monitor student engagement and consequently design learning activities accordingly.

Research Questions

The project will take the form of a field experiment in a first-year undergraduate module in introductory economics. The overarching research aim is to test whether behavioural interventions can improve educational outcomes. Specifically, this project will combine implementation intentions with goal setting to test whether there is an additionally significant effect to asking students to plan when they will complete their learning activities. The educational outcomes will be measured by the completion rate of practice exams, the final module grade, and a self-reported measure of wellbeing. In summary, the research aims can be listed as follows:

1. Does goal-setting have a significant and positive impact on student:
    a. completion of practice exams;
    b. final exam performance, and;
    c. wellbeing in the form of self-reported anxiety about the final exam.

2. Do implementation intentions have an additionally significant and positive impact on student:
    a. completion of practice exams;
    b. final exam performance, and;
    c. wellbeing in the form of self-reported anxiety about the final exam.

If goal setting and/or implementation intentions are found to positively and significantly affect educational outcomes as outlined above, there are profound implications for a wide audience. Firstly, it would provide evidence of the effect of goal-setting (and potentially the additional impact of implementation intentions) in the context of UK higher education for the first time for the academic community. The design of the project allows the synthesis of pedagogy, behavioural economics and educational economics, thus there are three potential areas of importance where this project has relevance for practice and knowledge. Secondly, if the

interventions are found to be significant, it would evidence that low-cost and scalable nudges can be used to help motivate and structure self-directed learning activities, which is of particular relevance to all stakeholders in the provision of higher education and beyond (further education, school homework, adult online learning). Finally, if these interventions are found to positively impact student wellbeing, this would provide the first evidence of such nudges on this outcome in the literature. This has universal relevance, from the individual student to the wider community.

Methodology

The approach of this project is that of a field experiment, where individuals will be randomly assigned to treatment and control groups to identify treatment effects and causality. Students will be randomly assigned to one of three groups, a control group, a partial treatment group (goal-setting), and a full treatment group (goal-setting and implementation intentions).

The experiment will be carried out on a first-year course in introductory economics at the University of Stirling during the period September-December 2020. The usual course enrolment is approximately 150 students, predominantly consisting of new entrants to higher education. The design of the experiment will create three groups of 50 students, which although will be randomly assigned, student heterogeneity can be controlled for as student characteristics are known. In particular, these are: gender, age, programme of study, and mode of study (full-time/part-time). Students who are repeating the course from the previous year can be easily identified and will be removed from the analysis to focus the estimation on students who have not interacted with the course previously. Ethical approval will be sought from the university in advance and is not envisaged to be problematic in securing.

The design of the experiment is to provide students with the opportunity to complete practice exams in preparation for the final exam. All students will have access to the same practice exams via the online learning management system used by the University, but similar to Clark

et al. (2016), students in the treatment groups will be provided with a goal-setting exercise. Students in the full treatment group will be asked in the goal-setting exercise not only how many of the practice exams they are intending to complete, but additionally when they are going to complete them.

The research aims will be measured and evaluated using the following outcome variables:

- 1a, 2a – completion of practice exams
    - student's individual completion record of practice exams, available on the university learning management system, including practice score, time taken to complete

- 2a, 2b – final exam performance
    - student's exam performance in the final exam, but also of interest could be the overall module performance (which includes an essay)

- 3a, 3b – wellbeing in the form of self-reported anxiety about the final exam
    - student's self-reported anxiety on a Likert scale

All data will be anonymised, both in estimation and reporting. The experimental design will be fully outlined to allow replicability and further evaluation in a variety of educational settings. It is also expected that this project will lead to the development of a new and emerging academic research field – applying behavioural interventions in higher education with evidence-based implications for pedagogy.

References

Clark, D., Gill, D., Prowse, V. L., & Rush, M. (2016). Using goals to motivate college students: Theory and evidence from field experiments. IZA Discussion Paper No. 10283.

Gilboy, M. B., Heinerichs, S., & Pazzaglia, G. (2015) Enhancing student engagement using the flipped classroom. Journal of Nutrition Education and Behavior, 47(1), 109-114.

Gollwitzer, P. M. & Oettingen, G. (2015). From studying the determinants of action to analysing its regulation. Health Psychology Review, 9, 146-150.

Milkman, K. L., Beshears, J., Choi, J. J., Laibson, D., & Madrian, B. C. (2011). Using implementation intentions prompts to enhance vaccination rates. Proceedings of the National Academy of Sciences of the United States of America, 108(26): 10415-10420.

Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2010). Intervention effects of information and self-regulation on eating fruits and vegetables over two years. Health Psychology, 29, 274-283.