CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	Combining mathematics and coaching to encourage student success in repeat exams
Authors	Casey, Deirdre;Murphy, Louise
Publication date	2019
Original Citation	Casey, D. and Murphy, L. (2019) 'Combining mathematics and coaching to encourage student success in repeat exams', Learning Connections 2019: Spaces, People, Practice, University College Cork, Cork, Ireland, 5-6 December, pp. 169-173. doi: 10.33178/LC.2019.34
Type of publication	Conference item
Link to publisher's version	10.33178/LC.2019.34
Rights	© 2019, the Author(s). This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. - https://creativecommons.org/licenses/by-nc-nd/4.0/
Download date	2026-11-01 13:10:01
Item downloaded from	https://hdl.handle.net/10468/10701

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Combining Mathematics and Coaching to encourage Student Success in Repeat Exams

Deirdre Casey
Student Engagement Office
Cork Institute of Technology

Louise Murphy
Student Engagement Office
Cork Institute of Technology

Introduction

As part of the 'Maths Positive' initiative in CIT, Maths modules were identified which were impacting negatively on student success and progression. A particular first year business Mathematics module in CIT was identified as causing difficulties to some of the students involved. When several years of exam results were analysed for this module, it was discovered that some of the students repeatedly fail and get caught in a 'Maths Loop'. In order to break this cycle, an intervention workshop was developed and piloted which sought to challenge the students to examine their own behavior and mindset around Mathematics study. The workshop combined Academic Success Coaching (ASC) with practical study techniques specific to the module. The feedback from participants was positive and we plan to apply this mixed method approach in addressing similar modules.

Context

Students faced with failure in Mathematics tend to respond in one of two ways: increased determination or helplessness and anxiety (Johnston-Wilder, Lee, Brindley, & Garton, 2015). Contrary to expectations, results in the repeated exams are often worse than the original results (Johnston-Wilder, Lee, Brindley, & Garton, 2015). Students can get caught in a cycle of failure. Non-cognitive factors (affective factors) can have a significant impact on students' performance in Mathematics. *Mathematics anxiety* was described by Spicer (2004) as "an emotion that blocks a person's reasoning ability when confronted with a mathematical situation" (p. 1). Being cognisant of the prevalent levels of Maths anxiety among mature students (Marshall, Staddon, Wilson, & Mann, 2017) and the fact that the level of Mathematics anxiety among fifteen year-old students in Ireland is significantly above the OECD average (Perkins & Shiel, 2016) it seems reasonable to assume that students at CIT who have failed exams may be experiencing levels of Maths anxiety. Lyon and Beilock (2012) recommend that interventions to improve the Mathematics performance of individuals with Mathematics Anxiety should focus on the way that the individual responds to their anxiety rather than attempting to teach them more Maths (Lyons & Beilock, 2012). Bearing this in mind it was decided to focus the intervention more on students' attitudes and behaviours rather than on Maths content.

CIT has an Academic Success Coaching service. ASC is generally focused on three main areas. Firstly, the student is facilitated in self-assessing current strengths, areas for development, study habits and levels of academic engagement. Secondly, they reflect upon this self-assessment and discuss these reflections with their Coach. Thirdly, the student is facilitated by the Coach to set goals and agree actions to achieve these goals. This process has been shown to be an effective method for increasing student success (Robinson & Gahagan, 2010).

Method

All students who were registered to repeat the exam in August were invited to attend. Out of 82 students, 12 signed up and 3 attended the workshop. In planning an intervention that combined elements of Coaching and Mathematics, it was decided to use team teaching as a method to facilitate the workshop. The workshop, firstly, incorporated the three stages of coaching, described above. Secondly, a study technique which was elicited from the students in the first part of the session was applied to specific module material. It was expected that students would feel empowered by tapping into their own expertise and by transferring their skills to this problematic area. It was also expected that they would set clear goals and have a process to achieve these goals after the workshop.

Findings

Feedback was gathered in several ways. On average the students rated the session at 4.75/5. All participants said they would recommend the session to others. They were asked to describe what they had learned and what changes they would make as a result of the workshop. Their feedback focused on the following themes.

Theme	Illustrative student quotes
Organisation	*"Very helpful to organise my study and to individualise my questions"*
Study Skills	*"How to allocate time to study"* *"Do little but often"*
Content specific planning	*"How to differentiate the different questions"* *"How to practice the questions properly"*
Attitude/ thought process	*"Gets you thinking"* *"Positivity"* *"Can do attitude"*

The exam results were mixed. Two of the students had significant improvements in their marks (S.L. 10% - 44%) (J.H. 17% - 26% - 57%). The third got a very similar mark to previous attempts. This

student felt strongly that the intervention would have been of more benefit at an earlier point. She described her attitude and knowledge before the workshop as

"I hadn't a clue the first two times, I really tried but I didn't do what I was supposed to do. I just panicked and looked at stuff without taking it in".

This contrasts with how she describes her approach after the workshop:

"*I was able to relax more and focus on what needed to be focused on..all I was thinking about was the amount I had to do not what I actually had to do…After sitting down with ye for the hour that day I actually knuckled down and said right I need to do this, this and this so that was that problem solved and then I actually went away and done it".*

Even though this student did not pass the exam there seems to have been progress towards more positive ways of working.

"I still did struggle with the exam itself but I went into it a lot calmer than I did the last two"

Conclusions

Although the attendance at the workshop was disappointing there is evidence to suggest that it had a positive impact on the students who attended. Even when the student did not pass the repeat exam their grade did improve, which is often not the case with repeat sittings. Although it is difficult to generalise from a small study it does seem like it is worth further exploration. Areas of future work would be to attempt to extend the provision of such an intervention where effects of non-cognitive factors are taken seriously when attempting to address underperforming students rather than just focusing on 'more Maths'.

Word Count: 1000

Works Cited

Johnston-Wilder, S., Lee, C., Brindley, J., & Garton, E. (2015). Developing Mathematical Resilience in School-Students who have experienced repeated failure. *8th International Conference of Education, Research and Innovation.*

Lyons, I. M., & Beilock, S. (2012). Mathematics Anxiety: Separating the Maths from the Anxiety. *Cerebral Cortex*, 2102 - 2110.

Marshall, E. E., Staddon, R. V., Wilson, D. A., & Mann, V. E. (2017). Addressing Maths anxiety and engaging students with Maths within the curriculum. *MSOR Connections, 15*(3), 28-35.

Perkins, R., & Shiel, G. (2016). *Implications for the teaching and learning of mathematics in Ireland* .

Robinson, C., & Gahagan, J. (2010). Coaching Students to Academic Success and Engagement on Campus. *About Campus, 15*(4), 26 - 29.

Robinson, C., & Gahagan, J. (2010). Coaching Students to Academic Success and Engagement on Campus. *About Campus*, 26-29.

Shibley, I. A. (2006). Interdisciplinary Team Teaching: Negotiating Pedagogical differences. *College Teaching*.

Spicer, J. (2004). Resources to combat math anxiety. *Eisenhower National*.

Three Learning Points

1. When academic staff and professional staff collaborate, greater understanding of an issue can be achieved.
2. While practical skills development in Maths is important for students, a fixed mindset can block their learning. Preliminary work in this area can allow for greater learning.
3. As well as mining the quantitative data in relation to 'problem modules', it is important to also research qualitatively so that the intervention can be appropriately targeted.

Question

Q. If modules had a built in element where students reflect on their mindset and learning style in relation to the subject, would it increase student success and progression?