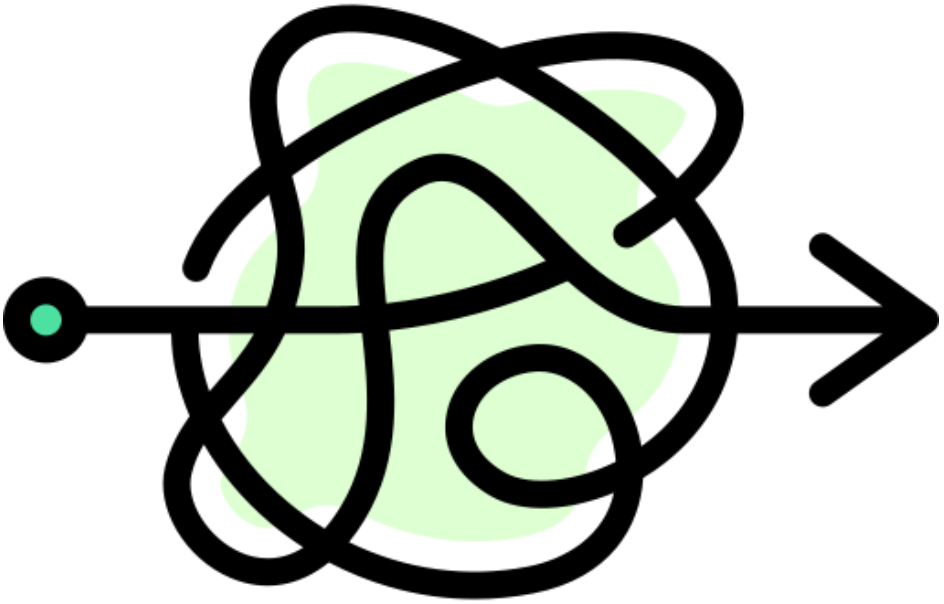
EDUCATION & TRAINING FOUNDATION

CENTRES FOR EXCELLENCE IN MATHS

C4ME CENTRE FOR MATHS EXCELLENCE

"YEAR 11 MATHS DIETARY REQUIREMENTS"



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Contents

Background

The Centres for Excellence in Maths is a DfE funded project charged with the research and development of teaching and learning in maths in Further Education. There are 21 Centres across England which are hubs for action research, training, innovation, and the sharing of successful practice over the whole FE Sector.

In 2019, over 180,000 students in Further Education were entered for GCSE Maths because they had not reached a “Standard Pass” – grade four – at secondary school (Joint Council for Qualifications, 2019). Of those entered, only one in five achieved a maths grade four (JCQ, 2019). After entering Further Education wearing a label of failure, students often find themselves in a cycle of resits. Most are only released from this by turning 19, rather than achieving a pass (Bellamy, 2017). This policy has drawn a large amount of negative attention.

C4ME (Centre for Maths Excellence) is the name of Grimsby Institute’s Centre - we emphasise the FOR part of the programme, highlighting that our raison d'être is to look FOR that excellence.

Grimsby Institute is part of the recently formed TEC Partnership. The Partnership presently comprises the Grimsby Institute, University Centre Grimsby, Scarborough TEC, Skegness TEC, The Academy Grimsby, Career 6 and Modal Training (TEC Partnership, 2020).

C4ME is based at the Institute’s Nuns Corner campus in Grimsby. The Institute serves areas which rank very highly for economic, social or education deprivation, recruiting a large proportion of its learners from three wards which rank in the top

four of these measures. The catchment of the Institute includes many areas where unemployment is higher than regional and national figures (Ofsted, 2020).

In the 2021/21 academic year, the Institute had around 13,000 enrolments – including full time learners, part time learners, distance learning, community learning, apprenticeships and 14-16 provision.

Over fifty percent of 16 to 19-year-old learners who enrol at the Institute have not achieved the benchmarked GCSE grade 4 (or C) in English or maths (Ofsted, 2020).

In 2021/22, the maths cohort consisted of around 1,300 learners, with the vast majority of these enrolled onto GCSE maths.

This report covers a small proportion of the work undertaken by C4ME in its efforts to improve learner outcomes in GCSE Resit Maths. This report is written by practitioners for practitioners.

Introduction

By speaking negatively about a subject, does this effect a student? Should we be spending time with secondary teachers and training their vocabulary to positively reflect opinions on maths, this can help the student better digest facing another cycle of GCSE maths upon attaining a ‘failing’ grade.

This small scale action research project aimed to increase attainment/progress in GCSE resit maths by collecting a greater and more specific level of data than previously about each learner’s prior experiences and journey in maths so that maths tutors in Further Education can plan their lessons in more informed ways.

The planned outcomes of the project were to produce materials to support this process, analyse available data on learner’s prior experiences and explain the ways in which the learning journeys of Key Stage 4 pupils can be used to inform planning and delivery.

Literature Review

Transition from year 11 to college

Since the further education reform (Wolf, 2011), year 11 students have had to continue mandatory education into either a college or 6th form until 19 years of age. This means that if a student has failed the GCSE maths and/or English, that learner has to continue with the course until a pass grade has been achieved.

The Smith Report of 2004 called for there to be more pathways from school to FE to aid the students in their transition, but this is still yet to be properly explored. (Smith, 2004)

In 2011, Michael Gove called for all learners to continue with maths education until 18-years of age by 2020 so that "Within a decade the vast majority of pupils are studying maths right through to the age of 18". This never came about, and the FE re-sit learner was made to continue in their mandatory resit lessons with the reform going ahead instead (Gove, 2011).

The MiFec Report (MiFec, 2020) has outlined many issues that FE teachers face every day in maths resit, and there has been a call for The Smith Report to be re-examined and for the transition pathway to be renewed

Students being disheartened by being “threatened” with having to resit maths in college

All too often students are put under pressure to pass exams, and regularly being informed by teachers to focus and study hard in maths and English or they will be “forced” to resit in college, or be released from the cycle of their 19th birthday (Bellamy, 2017). Our own team have even called this process a “threat” from the secondary teacher. This is counterproductive as the student already has a barrier to the courses, and the teacher is just creating a negative, hostile environment and instilling anxiety and fear into the student (MiFec, 2020, p17).

The pressure of passing a qualification when the students’ knowledge isn’t where it should be [according to national policy] then creates high-pressure where anxiety can begin to fester and grow (Boaler, 2009; Johnston-Wilder and Lee, 2010).

Resit seen as a punishment

From our discussions with secondary education teachers, and those apart of our own team that come from a secondary background, most students are not encouraged to believe that they are on a learning journey, and that all progress is a positive. Usually all that they receive negative connotations that if they don’t achieve the pass that they will be stuck in a cycle of resitting in the future. The lack of support from the teacher causes ‘systematic inequities [that] could negatively impact student learning by undermining motivation’ (Anderson and Peart, 2016)At school, positive enforcement of learning continuing beyond school is not widely used and it is then up to the college practitioner to build students’ confidence in maths and learning.

“Students were generally more positive about their experiences of learning mathematics in college than school, but few described these as enjoyable or liked the subject” (MiFec, 2020, p18)

Cycle of failure begins before the first exam is failed

Although they prefer the college environment, the student will always carry their anxieties with them into further life. Teachers observed that the question “How can a policy be both ‘undeniably positive’ and ‘soul-destroying’ all at once?” (Exley, 2019) rings all too true with students at Grimsby Institute as the need to pass GCSE maths is vigorously enforced, yet the students repeating cycle of learning the objectives in the same way year after year can be very demotivating (Bellamy, 2017).

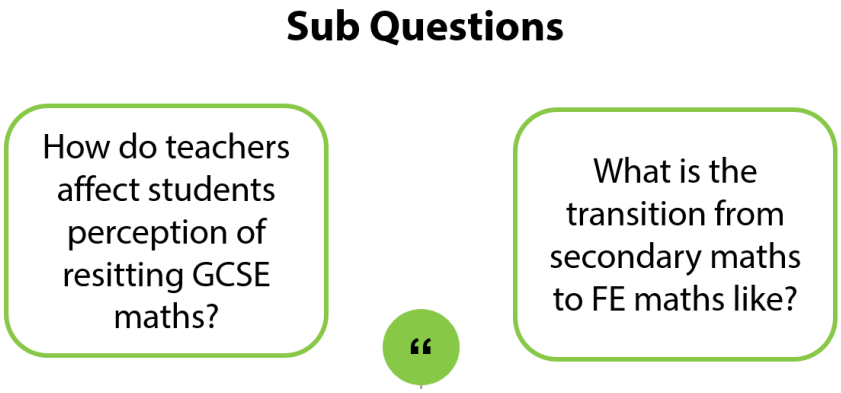
Anxiety is transferred from teacher to student

The Cockcroft Report outlines issues with students who faced anxiety in 1982, addressing students who felt “helpless” and full of “anxiety” when it comes to learning and relearning maths (Cockcroft, 1982, para 20). This shows that the anxiety experienced isn’t a new concept and has been known and addressed in the past.

Experts in the field have also identified how the negative feelings, connotations and anxieties that teachers (especially those who have not specialised in mathematics pedagogy) can be easily passed on to students (Johnston-Wilder and Lee, 2010). This is to not say that a teacher should change their personality to adapt to the

maths classroom, but they should be more vigilant of their own biases affecting the cohort (Wallace, 2013).

The review of the literature led to the formulation of two sub questions which heled refine and focus our research:



Methodology

Identifying the process

Our starting point was anecdotal evidence that students were disheartened when they came to college because they'd been threatened with having to resit at college if they didn't pass at school. We couldn't find anything to back this up in the literature.

We all know that literature in FE maths is quite thin on the ground and it's wonderful that the whole centres project is adding to the library of materials that are available to FE maths teachers and academics. Quite often, the literature that we looked at didn't primarily focus on maths or primarily focus on FE, but we were able to draw from it. For instance, we were able to find studies which looked at the transition from year 11, to college for SEND students.

GDPR, Ethics and Consent

Throughout, we have GDPR, we have ethics and we have the informed consent of our learners on our radar when we're collecting any data. Students were encouraged to be honest yet professional in their responses. Data was held securely and anonymised.

COVID Restrictions

Demands on FE teachers' time are always high and during the Covid-19 pandemic teachers had less time for research because their focus was on well-being, participation. We weren't able to visit and view lessons in secondary to identify the

language used in lessons around maths, or even have meetings with observers to help identify the key points we are looking for. Our research mainly lied within the cohort and our staff's experiences. The volume of research was greatly impacted by COVID because of the lack of ability to see the interaction between staff and the student. The observations and conversation that would have followed were unable to happen aswell, so we weren't able to work with staff to set language guidelines to identify impact.

Data Collection

Primarily our data was collected through a student survey for this project. But we were able to do lots of analysis on the data as the questions took different forms, for instance, short answers and long answers that we were able to code and look for themes.

We refined our aims and objectives as we went, tired making sure that the data was rich, and really focused on what we were looking for in the first place.

We were able to use Microsoft forms to send a questionnaire to learners who had recently started with us, in FE maths.

Refining of Aims and Objectives

We wanted to be able to come up with some recommendations for secondary teachers to help those low attaining year 11 students who they know will be passing on to GCSE resit at college. And we also wanted to come up with some resources to

help teachers with those year 11s progressing to resit maths in FE, whether it's secondary teachers, or further education teachers.

To further refine our research, we asked ourselves two sub questions which were kept on our radar throughout the project. How do teachers themselves affect students' perceptions of resitting GCSE maths and what is the transition from secondary to FE maths like for the learners themselves?

We were very aware of any biases that we might feel, with resit being seen as a punishment as we were going through our literature and through the process. But again, we've we found no evidence of this.

It was clear after the literature review that we needed to talk to the learners themselves.

Action Research follow cycles and we should make sure that every cycle feeds into every other cycle, and refined as we go around with this was to have one cycle of research. But did more cycles of discussion and thinking as we went on, especially as we prepare for next year's Year Elevens coming in.

Of course, COVID restrictions had an impact on how we collected our data. But we've made the best of the situation and use technology to our advantage.

Results and Discussion

A total of 98 students were surveyed [Appendix B] about their attitudes to and experiences of maths at school and college.

Approximately one third were happy about doing maths at college, a little under half had mixed feelings and a notable minority of approximately a fifth were not happy. The survey data confirmed that the vast majority of students only find out they have to do maths at college, starting only a few weeks after collecting their results in August or, for a little over a quarter, on starting college. They therefore have very little notice of studying maths, which is likely to accentuate a lack of commitment to this course.

1. Are you happy that you're doing maths at college?

More Details

Yes	31
No	17
Bit of both	41

2. When did you first find out that you'd be taking maths at college?

More Details

When I was still in lessons at s...	7
When I collected my results	47
When I enrolled at college	25
When I started lessons at colle...	8
Other	2

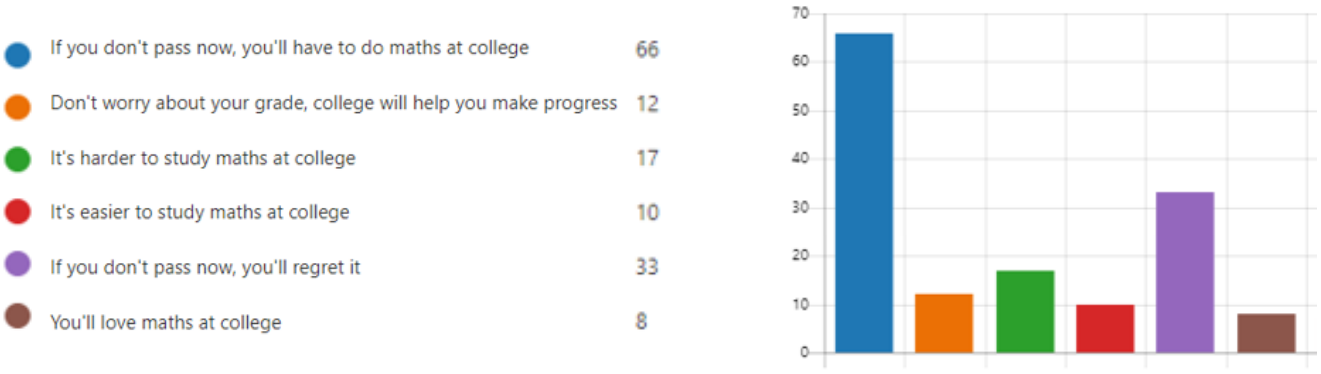
Students were also asked how they felt when told they had to take maths at college alongside their main studies.

3. How did you feel when you found out you'd have to take maths at college alongside your main studies? (Be honest, but be professional please) *

Enter your answer

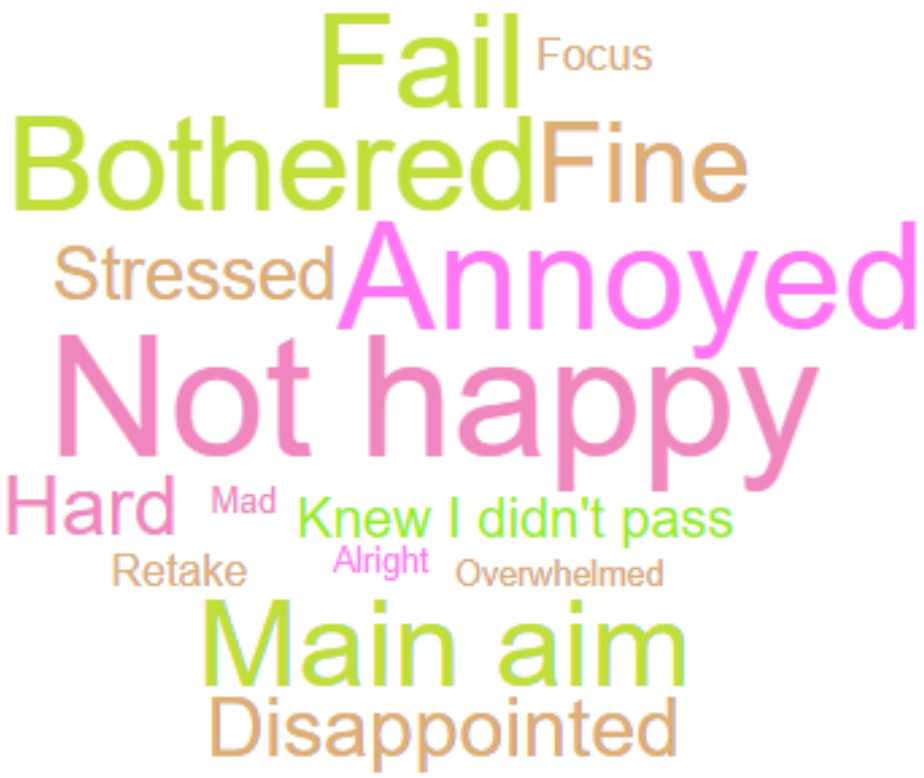
Students were then asked whether they'd heard teachers or others use particular language in relation to maths when they were at school. As shown in the chart below, 66 out of a total of 153 responses who heard 'if you don't pass now you'll have to do maths at college', which is a very notable proportion - over one third. Also particularly notable was the 33 instances of students hearing 'If you don't pass now you'll regret it', which similarly implies threat, possibly onerous and to be avoided, so maths at college is a negative. Only 20 responses were positive about maths at college. Note that each student could give more than one response.

4. Did you hear any of these phrases (or ones like them) when you were at school - either from relatives, friends or teachers? You can tick more than one.



The word cloud below was taken from the students answers and then coded so we could get a visual understanding of the majority feeling. The bigger words are the

ones that occurred most often, and each word had to have been mentioned by atleast 5 student entries.



Conclusions and Recommendations

Conclusions

We asked about feelings. Are they happy that they're doing maths at college? We're actually a bit surprised by the answers here. Only 17 of all the respondents said no, they weren't happy. Everyone else was kind of a bit of both, or they were quite happy to be doing it. That really surprised us. We wanted to get a picture of information and guidance, so when did these learners first find out they'd be they'd be taking maths at college, alongside their main aim. Was that while they were at school, when they collected their results, when they enrolled, or even once they started lessons? The vast majority said that they found out they'd be taking maths at college when they collected their results, which isn't surprising because once you've taken an exam, you kind of hope you passed, So it's not until you open that envelope that you realise that is when you're going to have to resit maths.

We asked the students to be honest, how did they feel when they found out they'd have to take maths at college alongside their main studies? Of course, we asked him to be professional, but we wanted an honest answer. Overwhelmingly, that first impression, when they found out that they had to do maths at college was negative. They were annoyed, they weren't happy, they're disappointed.

We wanted to find out if the learners heard phrases like: "if you don't pass now, you'll have to do bass at college", "if you don't pass now, you'll regret it". We also wanted to know if they heard that actually like maths at college.

Again, overwhelmingly, we seem to have some negative responses here. If you don't pass now, you'll regret it. If you don't pass now, you'll have to do it at college. There was nothing in this about it being a part of a journey. "Yes, you might not pass now, but you're not ready yet. Let's see what you can get soon."

We wanted to make sure that we had a broad spread of different schools in our data, so we asked the learners what school they went to. There were over 30 different feeder schools that the learners came from within the survey. We also had some homeschooled learners as well.

Then a bit of a risky question. Was there anything else they'd like to tell us about their experiences with maths at school? And again, we asked them to keep their language professional, but we did want an honest answer so we left quite a large free textbox. Those that chose to leave an answer in this box, again, were overwhelmingly negative towards school. There were negative towards teachers the amount of support, the class sizes. A response that was repeated quite a few times was that the learners found exams a problem. It was the exam at the end of the course that was an issue. But we also found that they were quite positive towards college, appreciating the need to work and the college was better than school.

This small snapshot of how the students feel when they come to college after being at school, has enabled us to make a few recommendations that we're hoping to act upon ourselves in this transition period.

So even though we weren't able to find any evidence, which backed up the thought that a reset was a punishment, we did find evidence about the cycle of failure and how learners feel when they're resitting the same exam over and over again, especially through Sue Johnstone-Wilder and Anna Bellamy.

That focus and our literature review also led us to the fact that anxiety is quite often passed from a teacher student in a maths anxiety way. So could it be true that the anxiety that a teacher feels about their learners passing could also be transferred to their learners.

Recommendations

Firstly, we'd recommend that the language used around resit is a lot more positive. Language can really help motivate, and by using the right information and guidance for learners, we can make sure that they hit the ground running when they come to us in September from schools.

If the learners know that the resit is just part of their journey, that is not a punishment, that it's okay to be in the maths class to be working towards that grade that's going to help them in the future, and that's going to make a massive difference to our learners. We're already moving forward with these recommendations at Grimsby, I'm thinking about how we can implement them.

If the learners are in the right mindset when they come to us, that can have a massive impact on their learning, and on their engagement and on their progress. We're putting things into action already for these year 11s coming through this year, looking at that information and guidance with our transition team, but also tying into English because quite often, as we know, the learners that do maths are also doing resit English.

So to sum up, the dietary requirements of year year 11 maths students must include the fact that they're on part of a journey. The school system in England and Wales is quite unusual, and that there is that break between 11 to 16, and then 16 to 19. We need to make sure that that break in between the two has as little impact on the learners as possible.

With the right language, the right motivation, and the right message that this is a journey, we could really help our learners.

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Appendix A – Resources

https://padlet.com/c4me/f15 - Posters ‘Maths for Professionals’

https://padlet.com/c4me/portal - C4ME Padlet page