

Increasing willingness and achievement levels in GCSE resit maths learners by using differentiated mastery principles and an effective praise system.

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Introduction

This research project was conducted by 4 teachers across 4 different colleges including Newcastle and Stafford College Group (NSCG), Stoke on Trent College, City of Wolverhampton College and Cheshire College – South & West. The colleges are all similar in terms of their vocational delivery and deliver GCSE Maths resit to 16 to 19 year olds. There were 219 learners included in the study, these were all GCSE resit learners, who had an entry grade of 1 to 3 and were sitting the foundation tier.

The Action Research (AR) topic was chosen as a result of the conclusions and recommendations from the project last year. The impact of the previous AR concluded that learners' motivation, engagement and resilience improved, therefore if we introduce further mastery techniques to deepen learners' knowledge and understanding we expect the impact to be greater.

We continued to use open ended questions, whilst incorporating a differentiated model using mastery techniques including concrete, pictorial and abstract methods to support deeper understanding for all learners. The topics were selected using the question level analysis from Pearsons on the most frequent topics with the poorest responses. The intervention also included a praise and support system to support with increasing motivation and engagement.

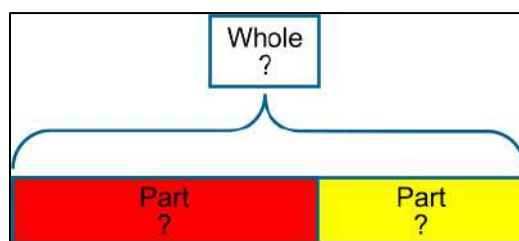
Intervention

We produced a 5 week intervention booklet with structured support through the use of bar models, with a view to remove the scaffolding as the learners worked through the intervention to become more independent and build resilience, motivation and engagement.

At the beginning of the intervention learners completed an initial assessment, and then repeated this assessment at the end of the intervention to measure the impact through the change in attainment.

Each week the learners were rewarded with a sticker based on their level of engagement. There were four levels of sticker – bronze, silver, gold and purple.

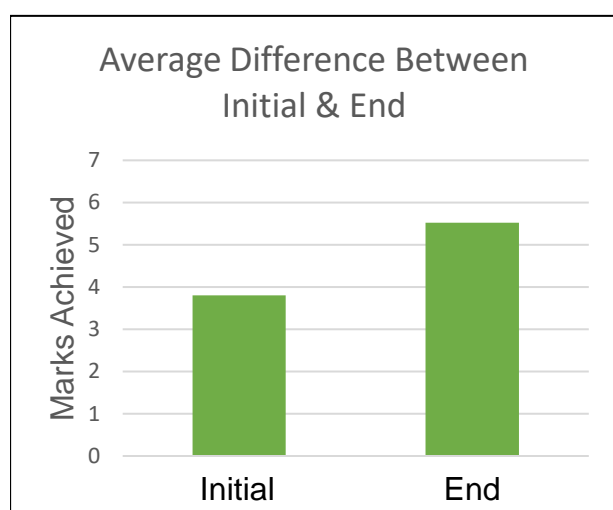
Learners were also asked to complete a survey before and after the intervention to measure their confidence levels and to assess whether the intervention had had an impact on this.



Results

The learners involved were given an introduction including what the action research was about, what their involvement would be, why the information was needed and how the results would be used. They were informed that all the project would be anonymised and that no personal data would be taken or stored and that they could withdraw at any time.

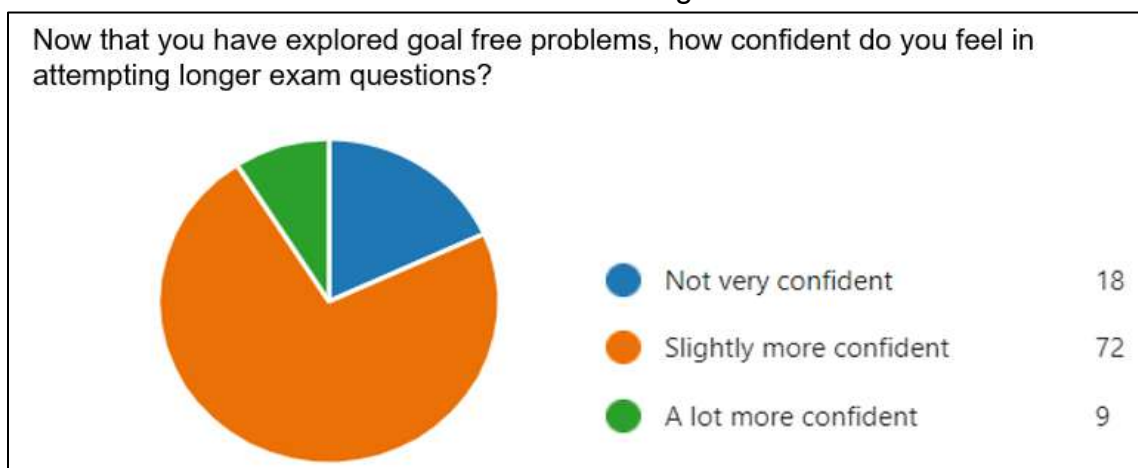
Overall, 78% of learners made progress between the initial and end baseline questions. This has shown that over the 5 week period, by practicing these exam problems and explaining to learners that writing down as much information as possible, marks can be gained and progress made. This is a real positive and from observation we felt that there was a great deal more confidence in their approach to answering from the beginning to the end of the project.



From the results of the learner survey it was shown that there was an increase in confidence of the learners when tackling longer exam questions, 81% reported that they felt slightly or a lot more confident.

The learners really engaged with, and were highly motivated by the sticker reward system that was implemented – 73% reported that they liked receiving the star stickers as a reward and would like to continue using goal-free problems in class.

These results were improved compared to those from the previous intervention, and the team felt that this was achieved by incorporating the mastery model of bar modelling.



We also had some fantastic feedback from the learner survey:

- “The bar models were beneficial and gave me a better understanding and more knowledge when I was solving the maths problems.”
- “The fact that the problems had no actual question, so it was fun trying sort out what could be a possible question and getting the answers to your suggested questions.”

Conclusions

- All colleges involved saw that the majority of learners made progress throughout the intervention.
- Through the intervention learners learnt skills that can be applied to longer exam questions, which was reflected in the increase in score on the baseline questions.
- Learners' confidence was noticeably improved by the intervention. Giving learners repeated exposure to low-pressure maths changes damaging preconceptions of the subject.
- Learners of all levels benefitted from this as the nature of goal-free problems is that they're differentiated by outcome.
- The time spent addressing single questions within the goal-free environment was well spent. The students, as evidenced by the survey, felt more confident after doing this activity in a less threatening environment with no marks or consequences - just being marked for effort.
- Some students really enjoyed using bar models for problems they hadn't though they would apply to.

Recommendations

- If the intervention were to be delivered again it would be beneficial to be run over a longer time period, and free from disruptions where possible such as the Christmas period.
- We found that more time was needed to teach the skill of using a bar model in different maths contexts. This is now being implemented in some of the colleges involved.
- Goal-free problems are being incorporated into the curriculum across the majority of colleges that took part in the action research for the run up to exams as they have been found to be so beneficial.
- Similar AO3 questions are being implemented in lessons to reinforce the progress made so far, including implementing paired work on these to encourage communication.
- Some of the questions being used in class, rather than being selected for their potential to be able to be solved using a bar model, are based on the topic being taught that lesson.

Get in touch

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