



Supporting Longer Written Answers in Biology

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'Students studying A-level biology have to complete a 25 mark essay question and therefore need to be taught how to construct a clear and coherent essay that contains good breath of scientific knowledge which is relevant to the question. Additionally GCSE Science reforms have meant that students have to answer more open response style questions, plus there is still an emphasis at GCSE to analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures, hence students need to be trained in being able to think clearly and organise their thoughts as to write better.'



What we did

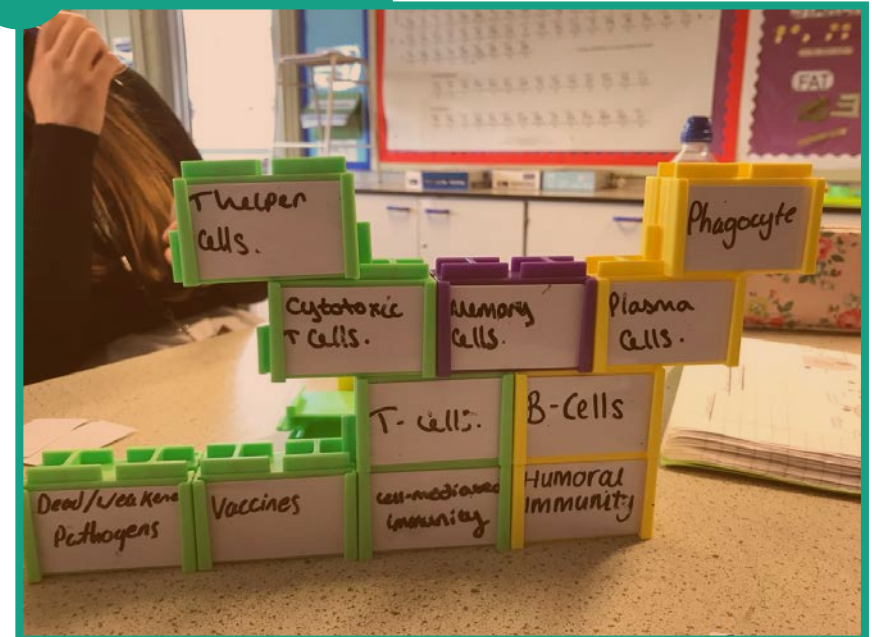
There were two focus groups: a higher ability year 9 group studying for GCSE Combined Science and a year 12 group that are studying A-Level Biology. Learners from all groups were given longer written response questions, but in addition, the year 12 students will be given essay questions to complete. They were given the appropriate graphic organisers to complete to help organise their thoughts prior to the questions. Marks for these questions were recorded to baseline students' performance. I also recorded the level of engagement of three students chosen at random using the engagement sheet in Paul Main's research booklet.

Then during the research learners were given bricks with pre-printed information on cards to organise in different ways as a collaborative exercise in small groups depending on the question / task, prior to completing a graphic organiser and then they attempted the essay / longer response examination question. As the research time frame moved on I then did not provide pre-printed cards instead asking students to generate and write their own terms to use on the bricks.

As this was a collaborative task, the dialogue that ensued afforded all students the opportunity to develop and answer to the longer response questions. They then worked independently on a visual organiser and then finally completed the longer written response question.



What it looks like



"By giving our students practice in talking with others, we give them frames for thinking on their own."
Lev Vygotsky



What we found

The impact of the structural bricks was highly positive on two accounts. Firstly, the oracy skills and confidence of students that were intrinsically reluctant to share their ideas improved. When questioned after the tasks students agreed that sharing their ideas and reorganising their thoughts helped them plan their written responses, plus it helped make the concept memorable. One student referred to picturing the group structure made from the structural bricks in her mind, whilst answering the question.

Results for both engagement levels and marks in the longer written responses improved. Indeed, I analysed the results of the class before using the structural bricks and after using the bricks using a paired t test and the difference in the data was significant ($P \leq 0.05$).



Impact on Pedagogy

The blocks made for engaging lessons which flowed with natural steps with clearly defined transitions and opportunities for peer and teacher led interventions. Firstly students sorted or generated the key terms. I was able to check that students had categorised the terms logically and query any I didn't think were correct. Then students worked collaboratively to make links between the terms as to build their structures. Again I could intervene if the connections between the terms was incorrect or poorly justified by the student.

The final activity involved students sharing their structures with other groups. They then completed a visual organiser task e.g. Double bubble diagram if they were comparing concepts e.g. Cell mediated immunity and humoral immunity. Finally they attempted the relevant examination question. I measured a significant improvement in pupil performance.



Next Steps

I plan to use the blocks with key stage 4 more frequently to help them organise their thoughts for concepts including information on the 7 required practicals they have to complete for Biology. I can use them to organise variables and methods. I also look forward to using the structural blocks with Key stage 3 students prior to their assessment tests as a way to consolidate knowledge and intervene if any misconceptions are highlighted through their use. The activities will also help extend student's oracy skills.



What it looks like

