

Technology and Data Practice Study

Using a flipped learning approach

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Gateshead College are one of the 21 Centres for Excellence in Maths (CfEM) and have been using a flipped learning approach in their maths teaching. We've spoken to Mark Stewart, GCSE Mathematics Curriculum Lead on the CfEM programme at Gateshead College, to learn more about the approach and how the teachers and students at Gateshead College have benefitted from it.

What practice has your centre been doing relating to the key principles for technology and data?

We have applied a flipped learning approach within GCSE maths for the majority of 16–18-year-old students for the last three years. Students are directed towards online learning material one week in advance of the weekly topic. They complete learning tasks at home: watching short videos, making notes and taking online assessments. Students then attend class with a basic level of knowledge, ready to self-assess and self-differentiate their own learning and extend it through stretch and challenge activities. This all forms part of the first of two 90-minute lessons a week.

The second lesson in the week is an assessment opportunity using a tool called Prove It. This introduces a more robust assessment to help measure distance travelled in class and progress over the programme. Students complete questions generated from Edexcel's ExamWizard, often edited to make them more challenging or to promote deeper thought, justification or discussion afterwards. These are open-book assessments where students apply their learning to Grade 3/4/5 exam material. The assessments are self-assessed, with reference to a mark scheme, and results put onto an assessment-for-learning (AfL) tracker. This shows students' scores for each topic, rated red, amber or green against their target grade, their progress over time, a predicted grade, and areas for development.

This AfL tracker has proven especially successful in motivating students. It also informs teachers of topics that would require further intervention and identifies potential issues with curriculum areas or individual teachers.

In the second year, we promoted student autonomy further. We achieved this by asking students to self-assess their competencies against set outcomes for each topic. This was completed at the beginning of the first lesson, after they had completed ConquerMaths, an online video tuition and assessment tool. This allowed students to quickly establish their own learning outcomes for the session, focusing on areas for development and bypassing pre-existing skills. Work was made available for each outcome at different levels – Grades 1–5 for Foundation – and students could freely choose which outcome they would work on and at which level. Answers were available to promote peer/self-assessment.

We were concerned that some students would always opt to work on Grade 1 or 2 material, or access mark schemes before completing work. This proved to be unfounded, we think due to the positive behaviours and responsibility fostered over time. In fact, the opposite of our concerns was true – students often chose tasks at a higher level than they were operating at themselves due to their increased confidence levels.

This was repeated over the 24-week curriculum and the results shared with students throughout. Students were actively encouraged to enter their own scores onto the AfL tracker to raise awareness.

This left a six-week window before exams in which students could reflect on their Prove It outcomes and the tracker to inform an individualised revision plan.

Which key principles is your work exploring?

We are exploring Key principle 2: Independent learning.

Why did you decide to introduce this approach?

We first considered a flipped learning strategy when the new 9–1 specification became mandatory in Further Education. This increased the required teaching time beyond that which students could access in a traditional academic year: 30 weeks of 3 hours, meaning 90 hours contact in total.

We felt that we needed longer to cover all the topics but were unable to increase contact time in the classroom. We decided to increase learning out of the classroom using a flipped learning approach.

How did you approach introducing this way of working?

For the academic year 2016/17, we purchased a licence for ConquerMaths. We then revised our scheme of work and modelled it with weekly tasks created within ConquerMaths. These tasks included short videos linked to the topic being taught each week.

Typically, two or three videos (and their assessments) were set per week, approximately one hour of work in total. Students were expected to watch the videos, make notes of the key points and useful strategies in a notebook designed especially for that purpose, and bring this into class for the first of their two 90-minute lessons. The platform automatically released and then closed the tasks one week either side of the Monday of the week in which that topic was studied. We believed that this would promote timely completion and positive student behaviours. The information gathered from this process was intended to be simple yet essential underpinning knowledge, typically delivered by the teacher to the group in the first 30 minutes of a lesson. The videos also included a summative assessment, completed online, the results of which were automatically fed back to class tutors via a running feed on the web page. These assessment results were often used to inform lesson planning at class or individual level.

We believed that having this basic level of knowledge acquisition on entry to the lesson would allow learning to be accelerated, allowing students to make progress with each topic in a shorter period of time, thereby allowing more topics to be studied across the year.

What do you think the outcomes have been? Why do you think it has been effective?

Students have found the methodology to be a rewarding and positive experience. They make more progress, feel more confident and perform better in assessments. Students arrive in class with less fear and anxiety. They have a new-found confidence as they're able to work through the simpler elements of the topic at home in a safe environment where they can watch the videos and attempt the assessment multiple times without fear of judgement. They engage more with tasks, work more independently and demonstrate improved self-efficacy by becoming practised at making decisions regarding their own learning and self-assessment.

Students fully realise their autonomy; textbooks are on all tables, student-made posters are on walls, and mobile phones are embraced as a way to access content.

The traditional transfer of information by teachers has been reduced as collaborative group work, rich tasks and discussion become the predominant method of learning. We can facilitate learning at individual or group level, while retaining the flexibility to react to students' needs, bringing focus back to the whiteboard when required.