Case study of effective practice 2010/11

The LSIS STEM Programme

Teaching and learning

City of Stoke on Trent College: Bridging the gap between KS4 and KS5

City of Stoke on Trent Sixth Form College

Project title: Progression through STEM - Bridging the gap between KS4 (GCSE) and KS5 (A level)

Theme: Progression through STEM

"The progression from KS4 (GCSE) to KS5 (A level) can be very challenging in terms of the new subject knowledge and skills the students need to develop.

"...It was felt that many students were intimidated by the KS5 'lab'; therefore, a bridging activity which involves use of laboratory protocols... would be useful... Some students found it difficult to read technical text and protocols; therefore, it was suggested that these skills should be developed in the 'bridging' activity."

Summary

City of Stoke on Trent Sixth Form College has approximately 1,800 students with about 800 studying in the science faculty. In addition, in September 2012 a new Science and Technology Centre will open next to the college as part of the UniQ project. The aim of this case study was to identify key skill weaknesses at GCSE level to enable strategies to be implemented which better aid the progression from Key Stage 4 to Key Stage 5. The preliminary outcomes of this project have identified that the bridging activity would have to develop a number of skills including the students' laboratory skills and their ability to read technical text and laboratory protocols.

Contents

About the college

City of Stoke on Trent Sixth Form College has approximately 1,800 students with about 800 studying in the science faculty. There is a range of courses taught within the science department including AS/A2 biology, chemistry, physics, environmental sciences, applied science BTEC Level 3 extended diploma, GCSE science core and GCSE science additional. In addition, in September 2012 a new Science and Technology Centre will open adjacent to the college as part of the UniQ project. This centre will have shared provision with Staffordshire University and Stoke on Trent College.

Science at KS4 in the city of stoke has undergone major changes over the last few years and this has created a need for the college to reviews its science offer at KS5 to better meet the needs of its students. In particular there has been, in the last three years, a significant increase in students wishing to progress to A level study with a BTEC in science as opposed to a more traditional GCSE portfolio of science qualifications. The impact of this has been most felt in AS courses especially chemistry and maths due to the lack of underpinning algebraic skills.

The challenge

Students from local schools progress to City of Stoke on Trent Sixth Form College to study A level sciences upon attaining appropriate grades in GCSE sciences. The progression from KS4 (GCSE) to KS5 (A level) can be very challenging in terms of the new subject knowledge and skills the students need to develop.

The aim of this case study therefore was to:

- Aid the progression from GCSE science to A level science by identifying the key skill weakness at GCSE level and mapping this against the current A level requirements.
- Identify the key weakness and then to put in place teaching and learning strategies which enables the bridging of the gap between GCSE and A level. Through this strategy it is hoped that the needs of the learners will be better met thereby leading to greater retention and achievement in A level chemistry and mathematics.

The activity

The initial activity has involved Local Authority (LA) advisors in maths and sciences working with KS4 partners to identify the skills required to consolidate high GCSE grade achievement students (A * and A grades) and mapping theses against specification requirements.

The science department at City of Stoke on Trent College has undertaken a range of student focus group meetings with chemistry, psychology and maths AS level students. These meetings, facilitated by the college quality manager, have focused on the students' perception of the difference in terms of teaching and learning strategies, amount of work and depth of understanding between GCSE/Level 2 courses in Year

10 and 11 and these same subjects at sixth form level.

The city's local advisor for science was asked to observe several KS5 science lessons in college as well as KS4 lessons; the college senior lesson observation team also carried out a week of lesson observation in AS and A2 chemistry. The science advisor was also asked to make a presentation to the whole college science team on good practice in the teaching and learning of science at KS3 and 4.

Upon completion of these activities we will develop an action plan across the sciences to determine teaching and learning strategies to best bridge the gap between GCSE and AS level.

Outcomes of this feedback are in the summary sheet attached (Summary: Bridging Activity).

The outcomes

The project is at an interim stage but has achieved the following outcomes:

1. The activity has further motivated staff to develop strategies to improve the quality of teaching and learning.

2. A number of areas have been identified from both the local advisors and college staff feedback which may bridge the gap between KS4 and KS5.

These areas include:

- It was felt that many students were intimidated by the KS5 'lab'; therefore, a bridging activity which involves use of laboratory protocols and an opportunity for students to gain experience of lab work would be useful.

- It was identified that some students found it difficult to read technical text and protocols; therefore, it was suggested that these skills should be developed in the bridging activity.

- It was found that flip cameras were used routinely at KS4 which staff felt they could also use at KS5.

- It was found that at KS4 there was showcasing of exemplar GCSE work before starting a new assignment. It was suggested that a similar approach could be adopted at KS5 by showing examples of good and bad student lab reports etc.

3. Having identified a number of strategies to 'bridge the gap' some of these will now be trialled as a pilot study with a group of college science students.

The impact

This case study has a number of potential impacts:

- To bridge the gap between GCSE and A level science and mathematics, thereby leading to greater retention and achievement in these subjects.

- For staff to develop new teaching and learning strategies to overcome the challenge. Which will involve working as a team to reflect on their teaching and learning strategies.

- To make students better equipped to progress to, and achieve higher grades at, A level sciences and mathematics.

Additional resources

We have included a summary of our activity alongside this case study:

- Summary: Bridging Activity (Word doc)

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The LSIS STEM Programme

These resources are examples of effective practice in STEM teaching and learning; they have been produced by regional STEM Champions working with managers and practitioners. The contents should not be compared with commercially produced resources, although in many cases they may have comparable or better learning outcomes.

The LSIS STEM Programme offers unique support for the learning and skills sector, working with managers and teachers in all settings – colleges, work-based learning, prison units and adult education.
www.excellencegateway.org.uk/STEM

A consortium of leading organisations involved in STEM education are delivering the programme:

Science Learning Centres

The Royal Academy of Engineering

National Centre for Excellence in the Teaching of Mathematics