

Newport Girls' High School

– Stem Leaders Qualification

Sarah Little:
Assistant Headteacher

The SLQ is a qualification designed by the Centre for Science Education, Sheffield Hallam University, building on in-depth research into the development of youngsters' Personal Capabilities. www.personalcapabilities.co.uk/slq

STEM Leaders
Qualification

slq

The school

Newport Girls' High School is a high performing selective girls' grammar school. It became a Mathematics and Computing Specialist School in 2004 with a further specialism in Science in 2008. The school became an Academy in 2011. We regularly feature at the top of the league tables for GCSE and A Level results and we have a commitment to promote the specialist sciences and further increase uptake and performance at GCSE and A Level.

One of our targets is for students to work on a joint project across the specialist subjects of Science, Mathematics and ICT. One target was to deliver House STEM Quizzes. As a department we also look to engaging students through STEM quizzes, booster sessions for primary school pupils and other secondary partner schools as well as sessions for Gifted and Talented pupils.

We found that some of our own students lacked resilience; the ability to cope with challenge and the confidence to work independently without a great deal of teacher input and guidance. This was seen to be affecting their ability to learn and develop to their full potential so we resolved to focus as a school on developing our students as learners.



STEM activities at Newport Girls' High School

The majority of our Curriculum Enrichment Week has a STEM focus with many of the activities provided being joint projects between 2 or 3 of the STEM subjects. We have Mathematics, IT, DT and Art clubs running every day of the week for all key stages. At many of these clubs, Sixth Form students act as subject mentors and help girls in Years 7 – 11 develop or extend their skills and knowledge. STEM Leaders have become heavily involved in these clubs and have often run a series of activities over a number of weeks as part of the SLQ. As well as STEM Leaders we also do the Bronze Crest Award in Curriculum Enrichment week with the whole of Year 8.

Before starting the STEM Leaders scheme we used to struggle to find a team of four to take part in the Engineering in Education Scheme in the Sixth Form (EES) but this year we had 20 applications to choose from and the chosen EES team got engaged in the Gold CREST Award Scheme.

The project

We were aware of Sports Leadership courses and qualifications and knew that these were becoming available for other subjects. We contacted Edexcel regarding the STEM Leadership Qualification and decided to offer the Level 2 BTEC Qualification as an extra-curricular lunchtime club option for our best Y10 Science and Mathematics students. We ran this as a pilot for a group of 20 students who had completed GCSE mathematics in Year 9 and were working to achieve AS Level mathematics in Years 10 and 11.

We identified our Head of ICT as our Lead Internal Verifier as he had experience of BTEC and was used to moderating courses and students' written work. I worked with the Head of Science, Mr Tom Dawson, as the Assessor and Internal Verifier and also took on the additional role of Quality Nominee.

We studied Assignment Briefs provided by Sheffield Hallam University and used these to develop a program that suited the needs of our school and students. The program was based on two principal tasks in which students worked in groups of 4 or 5. For the first task, each group had to create a STEM quiz that would last one hour and deliver this quiz to a Year 7 or Year 8 class during their Mathematics or Science lessons. For the second task, each group prepared a Mathematics or Science two hour Masterclass lesson and delivered it to groups of approximately 18-20 Year 5 and 6 Gifted and Talented pupils.



The outcomes

Over the last three academic years 87 students have taken part in the scheme with almost all of them achieving a pass. Each cohort launches the scheme in a whole school assembly to promote the benefits to the lower year groups. In 2012/3 we had 80 % of Year 10 take part in the scheme. We have actually had to introduce an application process to ensure a more manageable number of students take part in the scheme. We have also extended the scheme to include groups that focus on DT and IT in addition to the initial subjects of Mathematics and science.

Students in lower years found it really exciting to have other students, rather than their usual classroom teacher, running a lesson. The STEM Leaders often adopt a different approach to the lesson or House Quiz and are prepared to devote a huge amount of time into making it varied, exciting, interesting and challenging. Many have adopted an investigative or themed approach that has involved students during lots of practical activities.

The feedback from the students and subject staff in our school and others has been overwhelmingly positive. The staff were amazed at the standard of lesson that the Year 10 students were able to deliver and the students have acted as great

ambassadors of STEM throughout the scheme. The students who have taken part have spoken at length about it being challenging but rewarding. Students also report that they feel it gives them something that is highly sought after by universities and that they have felt more confident during university applications and interviews. The testimonials supplied give you some of their perceptions.

EDEXCEL have adopted our Programme Booklet and Evidence Booklet as exemplar course materials and during visits and moderation/standardisation samples we have received a lot of positive feedback. However, completing feedback forms by hand was extremely time-consuming and became impractical once our numbers grew. We now have a spreadsheet system that means we can mail merge our responses and feedback to students. Having only two members of staff for 45 students was too many to manage and so we will either have to increase staffing or reduce the number of students taking part in future. Also, having the Exams Officer try and manage entries and certification did not work and we found that it was easier if the Quality Nominee did this using edexcelonline.

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The future

We now plan to extend the Leadership Qualification beyond the STEM subjects. Humanities are keen to run KS2 Masterclasses as part of a project on KS2 – KS3 transition and will probably run a group of Humanities Leaders this year with a view to extending this to MFL in the future.

To find out more about the STEM Leaders Qualification contact the
Centre for Science Education, Sheffield Hallam University on 0114 2254870.

www.shu.ac.uk/research/cse

SLQ Student Voice:

Freya Partridge, Rachel Bentham, Bethany Sherlock
and Rachel Bromley – Year 13 @ Newport Girls' High School

We were in charge of teaching a small group of year six pupils' new maths skills and developing their knowledge on several topics. Prior to the lesson we gathered the necessary resources including interactive warm up activities, question sheets and a task booklet. Overall, our group thoroughly enjoyed the experience and appreciated the opportunity we were given to share our mathematical knowledge with younger pupils. We learnt that planning ahead was a major part of ensuring that our lesson ran smoothly. We also believe that our pupils left having learnt a new skill. Overcoming difficulties taught us the importance of team work and pooling our knowledge before making decisions. A particular problem we faced was deciding whose idea to research further. This involved each team member being able to accept constructive criticism and required us all to listen to, and consider, other peoples' views.

Teaching maths to a younger audience required us to consolidate our previous knowledge on several topics and to ensure that we could explain them in a way that our pupils would understand.

We had to plan methods of teaching and go through each new concept step-by-step. At every stage, we checked that no pupil was left behind. We felt that our leadership skills were tested when we had to get the class' attention or when a pupil had a particular query. We had to take charge but also appear approachable and ensure that each child had no problem asking for help.

We also designed a quiz for students in years 7-10 that covered STEM subjects. We included individual rounds for each year group, team questions and practical rounds. Our main challenge was making the questions suitable for the ages of the students including skills/topics that they had previously learnt. To do this we had to research which Units each year group had already covered in their lessons and still make sure that the questions were challenging enough. We found that gathering the resources for this task was difficult as we needed a range of items from various departments of the school. Our team completed this task well as we worked together and split the work load evenly. Each team member stuck to their deadlines and made sure all work was completed to a high standard.

“ I strongly recommend getting involved with the STEM award, as it has taught me several valuable, new skills as well as developing the ones I already possessed. I had a lot of fun teaching others new skills, and got a deep sense of satisfaction from knowing that they had learnt something new by the end of the lesson. ”

Freya

Overall, our entire group found the STEM experience deeply satisfying, and feel that it has helped us to develop our leadership and team skills.

SLQ Student Voice:

Tanisha Hanna-Beards – Year 13 @ Newport Girls' High School

Earlier this year we took a STEM Leadership Qualification that involved teaching a primary school class for a whole afternoon and running a lunchtime club session.

The most difficult part for us was the initial planning of the primary school lesson. We had to decide on appropriate things to teach the children, liaise with the class teacher and delegate roles within the team. This was very difficult to begin with but when we broke it down into small manageable chunks we found it easy to organise. Each group member was made responsible for one section of the lesson. This part of the task certainly improved our negotiation, listening and communication skills!

Although the planning was difficult and we were very nervous about teaching the class, once we set all of our equipment up and introduced ourselves we soon settled into the teaching role. After a short while we began to get to know the class and also how to keep their attention. We found it really enjoyable and also beneficial to us as it improved our listening skills and helped us to learn more about the subject that we taught (space). We learnt more when we were teaching the class than when we had a normal lesson of science at school as we had to clearly understand what we were teaching the children before we explained it.

We also had to answer questions from the class which improved our knowledge and our methods of explanation. This part of the task was interesting and fun!

Overall we found the experience challenging at times and we definitely had our ups and downs as a team but we pulled together to produce some good work whilst having fun at the same time. We developed a number of skills including time management, listening, teamwork and communication skills. The course was beneficial for us as a team and also the children we taught both at the lunchtime club and at the primary school and we all agreed that we had a great time working together. We would recommend this course to anyone who enjoys leading, teaching or even just learning new things. It was definitely worth all the hard work and effort.

Overall, our entire group found the STEM experience deeply satisfying, and feel that it has helped us to develop our leadership and team skills.



“On my own I would have found it difficult but with a team to help me stay on track it all worked out well.”

Stevie (group member)

“I wish all of our science lessons were this fun!”

*Lauren
(pupil from the primary school)*

“The experiments were so fun and the group explained the science behind it all well.”

*Anonymous
(a pupil that went to the science club)*

“It was hard work but definitely very rewarding.”

Our Team

SLQ Student Voice:

Jenny Rowe – a Year 13 @ Newport Girls' High School

“ I was part of the first STEM leadership programme when I was in year 10. It was actually a considerable commitment but it was interesting and beneficial. I feel that the emphasis of the 'STEM leaders' experience was definitely upon the leadership aspect rather than STEM. From my point of view the STEM subjects weren't particularly stimulating. However, when I realised the SLQ was about 'teaching' I became more interested and, although I am now studying English, History and French at A-Level, I still value the experience the teaching and the leadership aspects of the SLQ. You don't have to be a great scientist to get something out of this qualification!

At the time, it is probably fair to say I was a less mature and less confident person. However, it would be unfair to say that this did not change over the period that I was involved in the STEM leadership award. My group was in charge of arranging the House Quiz for the first part of the award. Although it could be argued that we 'chickened out' of opening this quiz up to students that were older than us, the experience definitely helped us in leadership terms. We were completely in control of all organisation and had to ensure the attention of all students involved (this was daunting!) but we managed. Overall, I was proud of the event that we hosted.

Following this we had to teach a class of Year 6 students. This was perhaps even more challenging, in particular the generation of the 'primary-school-level' resources. It was hard to pitch the lessons right but I think that each student learnt at least one thing ... hopefully. I think learnt patience, clarity of speech and how to deal with excitable young children. It was nice to be out of my comfort zone working with children I didn't know at all and doing it with a team of people made it even more fun. ”



Right Students holding award at Newport Girls' High School