



Hill, Marianne C.M. (2012) A Study into the Participation and Engagement of Young People with Physics in Post-Compulsary Education. Doctoral thesis, University of Sunderland.

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INTRODUCTION TO SECTION 11

Supporting information

- Contents:** Introduction to Section 11
- Evaluations from former students at the FEC
- WISE Science Advisor Award 2011
- Newspaper articles of science related events

Discussion: The first part of this final section contains reviews from seven of my former students at the FEC, who willingly wanted to contribute towards this study. One of my former students, who achieved his A levels over ten years ago and progressed to study physics at York University, now comes back to the college to talk to current students about the opportunities available with physics degrees.

In September 2011, I was nominated for the WISE Science Advisor Award and by the end of the month, I was told that I had been short-listed and invited to London for the awards ceremony. On October 19th, I went to London, accompanied by Professor Peter Smith from Sunderland University, where I was delighted to receive the runner up award for this category. I was presented with a certificate from the Princess Royal and after the ceremony, all prize winners were taken to meet the Princess in a less formal environment. Following this award, there was a feature about this achievement in the local newspaper and the university magazine. At the end of the section are some additional items, such as newspaper features and photographs of physics events that I have held at the FEC.

Evaluation Form Former Students

Name: C

A levels studied at the City of Sunderland College:

AS Photography

A level Mathematics

AS Further Mathematics

A level Physics

AS Philosophy

A level Computing

Please comment upon the A level Physics course:

What topics did you like/dislike?

Topics relating to particle physics, generic “kinetic” topics such as force and momentum and anything relating to space was of a strong interest to me. In contrast, I found I had little interest with topics in relation to electricity. In general though, there was a good range of topics with sufficient depth on the course.

Did your A level studies prepare you for Higher Education?

As I am studying for a Masters in Civil Engineering, certain topics within Physics and Mathematics lead straight into that being taught for the field of civil engineering and engineering in general; generic engineering mathematics being of particular note. More specifically, these include force topics such as ‘moments and couples’, ‘force diagrams’, ‘momentum and impulse’ and ‘vectors, scalars and motion’. Further theoretical mathematic topics have also been carried through. Other skills such as time management for learning all the different subjects and topics, the ability to asses a problem and try to apply a mathematical / physical solution to it and team skills where all developed through, amongst others, the A level Physics course and are being applied in Higher Education.

Did your A levels prepare you for employment?

Though currently in full time education (university), basics skills such as communication, team building and that of being able to work independently and time keeping skills to name a few have all further developed due to the A level programme and are being implemented in my current part time job.

Signature:

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Evaluation Form Former Students

Name: H

A levels studied at the City of Sunderland College:

- Physics
- Chemistry
- Biology

Please comment upon the A level Physics course:

What topics did you like/dislike?

The Physics course was very engaging as it incorporated academic as well as practical elements. The topics were not easy, however they were taught in such a way as to attain a sound understanding, with plenty of support when needed.

As a student who did not study mathematics, additional support was provided as a supplement to the course. This additional help proved beneficial to my understanding of the subject.

The topic that I found to be most challenging was vectors, however the additional support sessions helped my understanding of this topic. The topic that I enjoyed the most was health physics, as this was of particular interest to my future career intentions. (I am now studying Biomedical Science at a local university.)

Did your A level studies prepare you for Higher Education?

All three of my A levels made a significant contribution towards helping me to progress to university. As I am studying Biomedical Sciences, the health physics provided knowledge and understanding of the detectors used in medical physics. Chemistry and Biology both provided a very strong foundation for the course.

Did your A levels prepare you for employment?

Currently, I am in full time education and do not have a part time job. I feel that my A level studies (all three sciences) provided a strong foundation for future employment.

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Evaluation Form Former Students

Name: J

A levels studied at the FEC: (2007 to 2009)

Physics, Mathematics and Chemistry

**Please comment upon the A level Physics course:
What topics did you like/dislike?**

The foundation topics such as forces, energy and the basic principles of waves, electrons and particles were very enjoyable and interesting. This is because they were crucial to any later understanding of more advanced physics and provided a foundation from which to expand and explore.

I disliked topics regarding electrical circuits, containing such things as capacitance, resistance and current. This was only due to a lack of interest in the topic once the groundings had been established. I didn't feel the need to study more advanced level physics in this area because it didn't interest me as much as other areas such as quantum physics or waves.

As well as the academic and study work the practical sessions and experiment required for the coursework part of the course were very enjoyable. It is always satisfying for me to produce my own results from experiments that display the theories and calculations gathered from study in a practical manor.

Did your A level studies prepare you for Higher Education?

Most certainly. This is down to the encouragement and support of staff I had available to me and the high level of work required throughout the course. My experience was different from those I have met in HE and it has given me the advantage over them.

Did your A levels prepare you for employment?

I am still at university!

Signature:

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Evaluation Form Former Students

Name: L

A levels studied at the FEC: (1997 to 1999)

Physics, Maths, Computing and AS Level Further Maths.

Please comment upon the A level Physics course:

I studied the above subjects from 1997 to 1999 at the City of Sunderland College with the enthusiastic support of Marianne Hill who was one of my Physics lecturers. Having an open door policy, she was always approachable, patient and encouraged all her students to do their best.

After completing my A Levels, I studied for a four year BSc in Physics (with a year in Europe) at the University of York. The course involved spending the third year at the Universite de Sciences et Technologies de Lille, Lille, France.

After completing my BSc in 2003, I studied for an MSc in Exploration Geophysics at the University of Leeds. This was an intensive course involving both taught theory and practical work in the field.

A three month dissertation was required as part of the course. This involved processing geophysical data collected by aircraft in Finland, these data provided by the Finish Geological Society (GTK) and I had assistance from staff at Getech Pic (a spin-off company of the University of Leeds).

After completing the MSc course, I briefly worked for Getech before leaving to do work in the field for several other companies. The work involved conducting geophysical surveys relating to archaeology, engineering and environmental projects. I returned to Getech in 2010 and my job now entails processing gravity and magnetic data; using geographical information systems (GIS) to assist in production of databases, printed maps, etc. is also a vital part of my work.

I have kept in touch with Marianne since leaving college. Several years ago, I was invited back to give a talk on geophysics and its uses to both first and second year A Level students.

I feel it is crucial that students are able to see at first hand some of the practical uses for the Physics and Maths they are currently studying; in other words, using gravity, magnetism, sound and electric currents to map what is beneath their feet.

Signature:

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Evaluation Form Former Students

Name: M

A levels studied at the FEC: (2008 to 2010)

- Physics
- Maths
- Computing

Please comment upon the A level Physics course:

What topics did you like/dislike?

I really enjoyed topics that covered aspects such as electricity, motion and space. Personally I didn't enjoy particle physics quite as much as other modules as it was a lot more theory based.

Did your A level studies prepare you for Higher Education?

My A levels will definitely help a lot when it comes to higher education. During my A Levels I developed my note taking skills to be able to take precise notes quickly to be able to write them up properly in the future and revise from, which is what helped me achieve a grade B at Physics A level.

My project in computing will no doubt help me in future years in university when I have to manage much larger projects than normal and focus on strict deadlines for work.

Did your A levels prepare you for employment?

A levels hugely helped me with my current employment, as I currently work in an electronics shop. Even little things like how to work out Power, for example, are extremely useful when helping customers find items that will suit their needs. Because of this I am a step ahead of some of my colleagues, who are excellent at customer service, but lack niche knowledge that will save time and ultimately can impact on sales.

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Evaluation Form Former Students

Name: R

A levels studied at the College:

Computing, Physics, Mathematics, Further Mathematics

**Please comment upon the A level Physics course:
What topics did you like/dislike?**

I found all of the topics covered in the physics course to be interesting, particularly any material covering EM energy, wave/particle duality and radio activity.

I found the teacher (Marianne Hill) to be incredibly enthusiastic about the subject, constantly showing how much she enjoyed the material, in turn helping to capture the interest of the class and ensuring that everybody thoroughly enjoyed the course. This level of interest and enjoyment was further helped by various activities showing the use of physics and engineering in the real world, for example the “airport challenge”, a visit to the St. Peters campus to discuss practical applications of physics and engineering in building the campus and a trip to the physics department in the University of York (which I currently attend as a computer science student).

Did your A level studies prepare you for Higher Education?

The planning and work load given in the A level course definitely helped to prepare me for university life, and the content covered in the physics course ensured that reading around subjects became part of everyday course life which I now class as more of a leisure activity than as extra work.

Did your A levels prepare you for employment?

The course ensured that time management and independence skills were increased in all of the students on the course, whilst ensuring that if you were unsure about anything then there was always support from a friendly and helpful member of staff. The combination of skills gained completing the various individual courses provided experience in a number of vital fields in a place of work (report writing, independent thinking etc), with extra support being given in various areas in extra modules such as critical thinking.

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Evaluation Form Former Students

Name: V

A levels studied at the FEC: (2008 to 2010)

Sociology

Maths

Physics

Please comment upon the A level Physics course:

What topics did you like/dislike?

While I was studying physics, my favourite topic (and the topic that I achieved the highest mark) was mechanics. I understood the concepts taught in this unit and really enjoyed learning about them. The idea that physical occurrences I saw every day could condensed into mathematical formulae was fascinating to me.

My least favourite topics were nuclear and thermal physics and also the astrophysics unit. I found these incredibly difficult to get my head around and as they were not areas of physics I found particularly interesting I did not engage with them as well as I should, have. Overall I am very glad I took physics as an A level, it was a very difficult course but I found it a rewarding subject and achieving well in any aspect of it gave me a really high level of self worth and pride.

Did your A level studies prepare you for Higher Education?

I feel that in reference to subject based knowledge that my A levels did not strongly aid me in my transition to University as the course I am studying is not directly related to my previous studies.

However in a broader academic light I feel that the work I did at College was very beneficial to me and helped enormously with the transition to Higher Education. My A level studies prepared me for the work load I would face as well as giving me greater confidence when it came to independent work outside of the classroom.

During college I learnt a lot about myself as a learner and this has helped me to reach my full potential at University.

Did your A levels prepare you for employment?

I am currently studying to be a primary school teacher, so hope that one day, I will be able to use the knowledge that I learned at A level.

Signature: Supplied



On behalf of WISE and the UKRC, Annette Williams and Jane Butcher would like to formally invite you to

The 2011 WISE Annual Awards, in association with EADS
Wednesday 19 October 2011, 1pm to 5pm
The Institution of Engineering and Technology
2 Savoy Place, London WC2R 0BL

The UKRC, the UK's lead organisation building gender equality and diversity in science, engineering and technology, in conjunction with the WISE Campaign, invites you to the 2011 WISE Awards ceremony.

The WISE Awards are a unique annual event, a special opportunity to recognise inspiring organisations and individuals actively addressing the core concerns of WISE: promoting science, engineering and construction to girls and young women.

We are delighted to confirm that WISE Patron, Her Royal Highness, The Princess Royal will present awards for: The WISE Excellence Award, The WISE Champion Award, The WISE Advisor Award, Primary, Secondary and Advanced Leaders Award.

After the awards there will be an opportunity to network while canapés and refreshments are being served. Her Royal Highness will leave at 3:00pm.

To confirm your attendance, email s.crowther@theukrc.org. Places are limited: please respond by 19 September 2011 to secure your place.

Please bring this invitation with you, together with a form of photographic ID. Please arrive by 1:00pm at the latest to allow time to register and security to check your documents.

We hope you can join us and look forward to receiving your confirmation.



THALES

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WISE
women into science, engineering
and construction

2011 WISE Awards
in association with EADS

WISE Advisor Award
Runner Up

Marianne Hill

Presented by

Her Royal Highness
The Princess Royal

19th October 2011

Annette Williams
Chair of the WISE Board

Jane Butcher
Interim Director, The UKRC



Winning teacher is an inspiration



Marianne Hill in the classroom

Published on **Saturday 3 December 2011 08:17**

AN inspirational physics teacher has been given top marks for her work with young people.

Marianne Hill, who teaches her subject at Sunderland College won the runner-up prize in the Wise (Women Into Science, Engineering and Construction) Advisor Awards. Marianne was presented with her certificate by the Princess Royal during an awards ceremony at London's Institute of Engineering and Technology.

Wise celebrates those who inspire young women into the field of science, technology, engineering and maths and Marianne was nominated for the award by academics at the University of Sunderland, where she has been studying for a doctorate qualification.

Marianne, a curriculum leader for science, mathematics and psychology at Sunderland College's sixth form campuses, was commended for her motivational work addressing the gender imbalance. Professor Peter Smith,

who nominated Marianne, said: “I don’t believe that I have met anyone as passionate about physics and why girls should study physics as Marianne Hill.

“She has truly devoted her life to her students and to expanding the horizons of the girls who study with her.”

Marianne says she saw a huge jump in the number of students who applied to study physics this term, especially the number of girls, who went from none to eight in the class.

She said: “I have always tried to do the best for my students so I am thrilled that my work has been recognised by Wise.” Asked what influenced her own decision to study physics, Marianne said: “I was interested in physics and astronomy at school, but became more determined to study physics after my careers teacher said that it was a difficult subject and not for girls. That convinced me that I had to do it.

“I love physics simply because it applies maths to solving real-life problems and explains everything from the smallest particle to the largest galaxy and everything in between.”

Angela O’Donoghue, principal of Sunderland College, said: “Marianne’s passion for her subject area has instilled a real sense of enthusiasm and ambition in her students. She is an invaluable member of Sunderland College’s teaching team and we are incredibly proud that her commitment has been recognised by Wise.”

Physics teacher engineers national accolade

Sunderland University

Released: Wednesday 23rd November 2011

A SUNDERLAND physics teacher has landed a runner-up prize in a prestigious national award for her work inspiring young people to consider a career in physics.

Marianne Hill, who teaches at Sunderland College, was presented with a framed certificate by her Royal Highness the Princess Royal during an awards ceremony at London’s Institute of Engineering and Technology.

She was runner up for the WISE (Women Into Science, Engineering and Construction) Advisor Award, which celebrates those who inspire young women into the field of science, technology, engineering and maths.

She was nominated for the award by academics in the Faculty of Applied Sciences at the University of Sunderland, where she has been studying part-time for a Professional Doctorate qualification; investigating the reason why young people, in particular girls, do or don’t choose to study physics.

A curriculum leader for science, mathematics and psychology at Sunderland College's sixth form campuses - Usworth and St Peter's - Marianne was commended for her motivational work addressing the gender imbalance.

The university's Professor Peter Smith who nominated Marianne, said: "I don't believe that I have met anyone as passionate about physics, and why girls should study physics, as Marianne Hill.

"She has truly devoted her life to her students and to expanding the horizons of the girls who study with her. If you met Marianne, you would study physics – believe me! She is relentlessly motivational, knowledgeable, and positive."



Marianne, from Sunderland, graduated with a degree in physics at Durham University in the 1980s, before completing Masters in Astrophysics in 1992.

She said: "Although I teach physics, I am also interested in the pastoral side of education and enjoy helping our students progress to university.

Marianne says she's now seen a huge jump in the number of students who applied to study physics this term, especially the number of girls.

"We've gone from having no girls in the class to eight this term," she said. "I also think that there is a much more positive influence in the media which is having an impact.

Marianne's Professional Doctorate - Engaging Young People with Physics in Post Compulsory Education, looks at areas such as teaching practice, external support on offer for students and teachers, parental influence on career decisions and improving communication skills, and will be completed next year.

The university's Professional Doctorate enables candidates to develop a work-based project leading to a significant contribution to professional practice.

Marianne also thanked her tutors and the lecturers at the University of Sunderland for their support, she said: “They have been really inspirational, they provide so much encouragement and motivate us to be the best we can be!”

Angela O’Donoghue, Principal of Sunderland College said: “It is our aim as a college to inspire our students, encourage them to achieve their full potential and build rewarding careers.

“Marianne’s passion for her subject area has instilled a real sense of enthusiasm and ambition in her students. She is an invaluable member of Sunderland College’s teaching team and we are incredibly proud that her commitment been recognised by WISE.”

A spokesperson from Intel UK, who sponsored the WISE Advisor Award, said: “Intel is very happy to be supporting this year’s WISE awards. Intel is committed to investment in gender diversity in STEM (Science Teaching Engineering and Mathematics) and believes the awards are an invaluable opportunity to recognise successful young women and those who are advocating the STEM industries. A cultural change to make these subjects and careers more open to women is exactly what is needed and these individuals are playing a vital role which will positively influence others in the future.”

Sunderland Echo

August 17th 2011

Teenager scoops £1,500 to help with stargazing at university

Grant has eyes on skies with award

AN inspirational teenager who has battled his own personal problems is hoping for top grades when he collects his A-level results tomorrow.

Grant Hardy, who has Asperger's syndrome, studies at Sunderland City College's Usworth Sixth Form site and is hoping to scoop A grades in mathematics, physics and chemistry when the exam results come out in the morning.

The 18-year-old, from Washington, has already celebrated being granted an education bursary after being nominated for the Helena Kennedy Foundation award by the college for his dedication and determination.

His tutors decided he was an ideal candidate for the bursary, having first arrived at the sixth form without the confidence and communication skills he has today.

Marianne Hill, curriculum leader for science and mathematics at the college, said: "Grant is an exceptional learner and a role model for other students. He was diagnosed with Asperger's syndrome and this affected his confidence and self-esteem.

"Grant is dedicated to his studies and has worked hard. Thanks to his efforts he is now a straight-A student. Grant has thrived personally as well as academically to such a point that he now prepares resources for other students."

Each year the Helena Kennedy Foundation

By **SUE KIRBY**

Education reporter
sue.kirby@northeast-press.co.uk

invites colleges across the UK to nominate up to five students who are overcoming financial and personal obstacles for an award to help towards higher education costs.

Grant received £1,500, which will help towards the cost of university and mentoring fees as he is set to embark on a three-year degree in Natural Sciences at Newcastle University.

The teenager's love for the sciences has extended into his personal life. He is a keen astronomer and with the assistance of his family, has transformed a garden shed at home into an observatory, which will come in handy when he studies astronomy as part of his degree course.

Grant said: "I found out about the award through Marianne. I was delighted to hear that I had won.

"I would like to thank the college for providing me with my mentor, Gordon. He has helped me enormously and I would also like to thank my lecturers and my tutor who have encouraged and supported me."

Twitter: @sunechoschools

● Teenagers across Wearside and Durham are awaiting their A-level results. To find out how they did, see tomorrow's Echo.



DELIGHTED: Grant Hardy.

Sunderland Echo February 23rd 2011

Astronomical extravaganza sends students looking skywards

Seeing stars in a 3D guide to galaxy

LESSONS were written in the stars for students taking part in a 3D spectacular.

The Sunderland Astronomical Society's (SAS) Dave Newton paid a visit to St Peter's Sixth Form to lead a guided tour of the galaxy.

Mr Newton's aim was to provide and insight into how the universe works, linking his talk to the college's maths and physics departments.

The second-year students wore special 3D glasses as they were taken on their trip around the galaxy. The session also taught them how to operate professional star-gazing telescopes.

Dave said: "Science is the mathematical explanation of everything around us. The subjects of science and maths compliment each other and can really take students into a wide variety of careers, be it astronomy, pharmacy, engineering or even teaching.

"One of the benefits of astronomy is that people taking it up as a hobby don't need special equipment other than a clear sky, so it is

By **BEN STORES**

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a delight to be able to pass on my knowledge to benefit others."

St Peter's Sixth Form currently has 162 full-time students doing either an AS or A-level course in science or maths. In 2010, A-level biology, chemistry and physics achieved a 100 per cent pass rate.

Marianne Hill, curriculum leader for maths and science said: "The students really enjoyed the session, many of whom showed great enthusiasm for the subject which I'm sure they will build on in the future.

"Here at City of Sunderland College, we endeavour to offer all of our students interesting activities to take part in to expand their learning, in addition to their traditional studies."

Last academic year, City of Sunderland College achieved an overall 99 per cent pass rate for A-level subjects, the highest in the city.



UNIVERSAL APPROVAL: Students don special 3D glasses for the star-gazing lesson by Dave Newton, pictured above with Colin Chaplin.

Evening Chronicle

March 3rd 2011



3D VISION – The class enjoy the 3D presentation

Students set their sights on the sky

STUDENTS from City of Sunderland College have been given an insight into the inner workings of the universe after being given a 3D tour from the Sunderland Astronomical Society (SAS).

The workshop was delivered to A-level maths and science students by Dave Newton, a founding member of SAS, who provided an insight into how astronomy is closely related to the work the students do in their lessons at the college's St Peter's Sixth Form.

The group of second years donned

special 3D glasses to take part in the session, exploring the galaxy from inside the classroom, and were also shown how to operate professional star-gazing telescopes.

Mr Newton said: "Science is the mathematical explanation of everything around us. The subjects of science and maths can take students into a wide variety of careers be it astronomy, pharmacy, engineering or even teaching.

"One of the benefits of astronomy is that people taking it up as a hobby don't need special equipment other than a clear sky, so it's a delight to

be able to pass on my knowledge to benefit others.

"It was a pleasure to visit the students at St Peter's Sixth Form to deliver the workshop, which follows on from a similar visit I made to Usworth Sixth Form last year.

"The students were very keen to chat about physics, chemistry and maths after the session, and their motivation and knowledge of the subjects they study was really impressive."

Marianne Hill, curriculum leader for maths and science at St Peter's, said: "The students really enjoyed

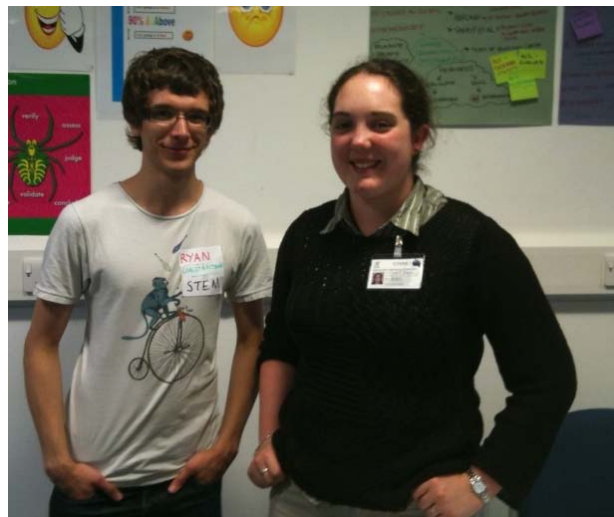
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St Peter's currently has 162 full-time students doing either an AS or A-level course in science or maths. In 2010, A Level biology, chemistry and physics at St Peter's Sixth Form achieved a 100% pass rate.

Institute of Physics Activity With STEM Ambassadors (July 2011)

A one day event for pupils from our partner schools which highlighted the need for engineers to work on the production of Music Festivals. These are the STEM ambassadors who helped with the event. They are current undergraduate students, and it was nice to see a female engineer!



STEM Activity Practical Laser Workshop

A team of PhD students from Durham University came in to the FEC to run practical workshops with our AS physics students. The university students brought in their own equipment and used lasers to measure the refractive index of ice.

