

# Initial Teacher Education STEM Project

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In this project nearly 60 students from the second year of the 3 year BSc in Secondary education are developing an activity day for Science Week (early march) involving school pupils from across the city.

The students come from Maths Education, Science Education and Design and Technology Education subject areas



They work in mixed groups of 6 students (two from each area of the curriculum) to produce an activity from the list SHOWN. They are then to deliver the activity to a group of Year 8/9 students from a local school they visited in the first semester. As subject specialists they have to take responsibility for the learning objectives for their specialism—but within the context of the whole activity.

## STEM—Science Technology Engineering Maths in Secondary education:

This initiative is perhaps finding difficulties in its delivery in some schools due to the perceived barriers between subjects and the hierarchy of value that some place on specific types of knowledge or learning. We hope by engaging trainee teachers in developing their own STEM projects we can begin to break down these issues in the future. It also appears from our initial research that the trainees appear to view the subjects in particular hierarchical perspectives depending on their subject specialism. We hope to establish if the project challenges or changes any of these issues.

### Question 1—What's going well

- 3 Schools (90 pupils) have agreed to take part
- Students have submitted their group planning
- Hallam Hall is booked for the activity
- The funding should provide adequate materials for the activities and transport and lunch for the school pupils
- Students have completed short placements at the schools to develop an understanding of STEM related issues
- Group planning reports have been submitted
- The groups are really discussing cross curricular issues and working together as autonomous units.
- Anecdotal evidence shows the perceived hierarchy of subjects is really being challenged



### STEM Themes for Task—as given to the ITE students

The following list gives a series of starting points for the possible projects you may select for the Science Week activity.

Bridges/Structures – e.g. looking at building/destructive testing models and structures of bridges or other similar structures in buildings like the winter gardens etc....

Sustainable Energy – e.g. looking at carbon footprints and how we design with renewable energy sources in vehicles like solar power cars etc.....

Healthy Snack drink – e.g. looking at how healthy alternatives to energy drinks like fruit smoothies are developed and packaged etc.....

Access all areas – e.g. looking at redesigning areas like classrooms, museums, galleries for disabled access.....

Bag with a new life – e.g. forget 'Bag for Life' this is about using recycled/reused materials to develop a shopping or fashion bag, or ipod case or phone case etc.....

Light up your life – e.g. looking at light and reflection and how simple low energy sources, components and smart materials can be used to provide either functional or decorative light....

Making a connection – e.g. 'Miss, but I don't need a fuse tester!' – looking at basic continuity in simple electronic circuits and possible products that might be a little more Generation 'y' than a fuse tester!

Blowing Hot and Cold – e.g. finding interesting uses for Thermo chromic inks/products or other weird and wonderful new materials to gauge mood/attraction and who knows what else.....

Move and Groove – e.g. looking at mechanisms and how they transfer energy and motion making things 'dance'.....

## Promoting learner autonomy in Initial Teacher Education



### STEM in the future



Is there light at the end of the tunnel?

### Question 2—What's not going well

- The placements were time consuming to arrange and not all groups were able to stay together
- The range of projects chosen was quite limited
- The ordering of materials is an issue –who has time etc—how do we distribute small orders?
- The ethical issues of CRB checks, photo permissions etc have to be negotiated
- It's January ALREADY!
- Travel issues still have to be arranged/resolved
- Some group dynamics have been a challenge
- Some activities may need closer risk assessment which could lead to revision.

### Assignment tasks—using the activity to focus assessment and engage the learners

Students are to produce a group planning report and then a final individual evaluation of the day to include

Records of their meetings including attendance.  
Reflections on the decisions made.

A Plan for the STEM day project for your group that shows what they intend to deliver on the day and how they intend to deliver it.  
The Plan must also detail any resources they require and have a clear time line.

Each person in the group must have a clearly defined role.

A clear definition of the objectives for the learning activity for Science, Maths and Design and Technology must be provided

Detail of the outcomes they intend the pupils involved to produce.

Details of how they will evaluate the success of the overall experience for the pupils and their team