Ed Carew-Robinson
Ed McLaughlin
Stephen Phillips

Implementing an inquiry based approach into our school

Wilson's School is a selective boys school for 11-18 year olds.

We approached the use of inquiry in our school from two different perspectives:

1) How should we go about teaching inquiry at Wilson's School?

What topics shall we pilot teaching at Wilson's teaching? What are the challenges faced by the teacher and by students?

2) What happens when we raise students' self-awareness of their communication skills, using inquiry tasks?

How will the staff and students feel towards inquiry-based lessons? Will they enjoy them? Will they trust them? Will they see the value in them and their relevance to the real world?

Next steps?

Use data from our questionnaires to assess whether a series of inquiry-based tasks have changed our boys' perceptions of inquiry-based learning

Topic inquiry at the beginning of year 9 (e.g. density)

SAILS group work strategies shared with school as part of new CPD sessions for next year

Develop the level descriptions for practicals

Attempt to assess inquiry-based team work skills and track the development of these skills over time

Incorporate our observations of students' inquiry-based work into written, termly reports

KS3 Science (11-13yrs):

Open ended investigations were introduced to students, one per term, with a focus on variables, data presentation, drawing conclusions and evaluating experiments

Progress seen following inquiry-based tasks?

- Improved ability to design testable question
- Identifying and control variables
- Some improvement in abilities to draw conclusions
- Improved student engagement with practical tasks

Challenges

- Recognition of set skills, no recognition of teamwork, developed practical techniques, complexity of work undertaken (risk takers tend to score worse than those that go for safe option)
- Open ended task can be daunting for some
- Initial ideas can be too ambitious and not testable
- Obsession with getting the right answer and all the marks on the mark scheme
- Very open ended tasks requiring careful practical skills were too challenging
- Evaluation of methodology remained a difficulty
- Organisation of practical task can be difficult due to different investigations. Where a common method was used, this was easier but made the task less open ended.
- Teachers need to be willing to hand over control to students
- Difficult for teachers to step back and not give hints

KS4 Physics (13-16yrs):

"Inquiry as discovery" – one lesson practicals to aid course content

Focus on making accurate and careful measurements, presentation of data, controlling variables in order to produce valid data and evaluating methodology

Progress seen following inquiry-based tasks?

- Student understanding that science is more than just a body of knowledge
- Student retention of understanding is better when it has been experienced
- Some of the less academic have had a chance to shine and shown real creativity and understanding of the process of an investigation
- Simple one lesson tasks can be built into a scheme of work to develop certain skills

Challenges for pupils:

- Anxiety about not getting the 'right answer'
- Knowing where to start
- Applying techniques for measuring accurately

Challenges for teachers:

- Ensuring that all in a group contribute
- Getting pupils to engage with each other's ideas and offering critiques
- Allow the pupils to make mistakes (but make sure they learn from them!)
- Finding time and space in the scheme of work to fit these practicals

KS4 Biology (13-16yrs)

Prior to any inquiry students were asked a questionnaire to look at their emotional perceptions related to inquiry tasks and their role in group tasks.

Open ended investigations were used as a platform to investigate the students' communication skills Students were asked to evaluate their, and others', contributions to the different stages of discussion and compare this with those of an 'observer' who did not take part in discussions, only observed. The intention was to raise boys' awareness of their roles within collaborative work.

During these tasks students reflected on their perceptions of the conversation dynamics, when compared to the observer's, and to suggest a role that they may have played in the discussion. Finally, students were asked how they felt about this role and what they could do to change it, if indeed they wished to.

Post inquiry tasks the same questionnaire was taken and any change was investigated. (Some examples of change can be seen below)

Progress seen following inquiry-based tasks?

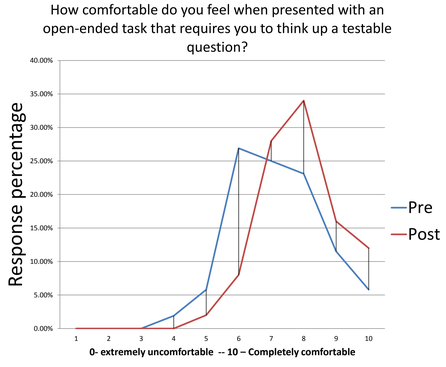
- Improved ownership of, and engagement with, practical tasks
- Greater appreciation of the relevance of practical work to the real world
- Greater student confidence in constructively criticising others' work ('peer review')
- Heightened self-awareness of the roles that students were playing within group discussions

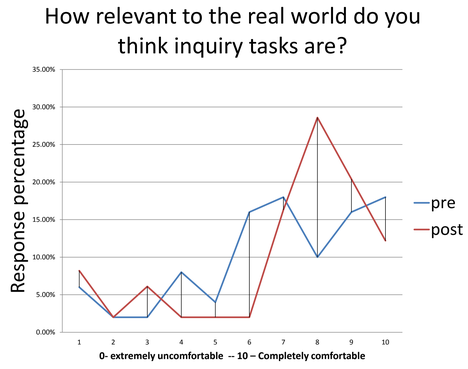
Challenges for pupils:

- Accepting the judgements of the 'observer' as objective judgements was difficult for some to accept
- Appreciating the progress that can be made when their avenue of inquiry did not proceed as they expected

Challenges for teachers:

- Pitching the correct amount of input information to tee up a directional, but open-ended, task
- Monitoring the balance of animated, constructive, discussion and antagonistic arguing possible in discussions





Tasks used:

KS3 Science (11-13yrs):

How does spaghetti change when cooked?
What affects the radius of an ink splash?
What affects the strength of electromagnets?
Investigating Paper Helicopters
How can you keep a cup of coffee warm?
How effective are microbe inhibitors?

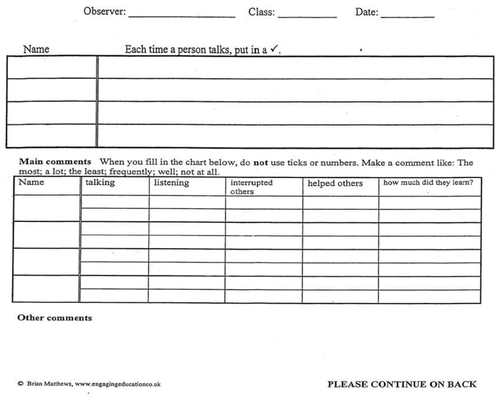
KS4 Physics (13-16yrs):

Electrochemical battery
Hooke's law
Efficiency of a bounce
Factors that affect heat loss

KS4 Biology (13-16yrs)

Cookie mining
What factors influence the rate of photosynthesis in *Cabomba* sp.?
How does exercise influence the cardiovascular system?
Data exercise: What are the effects of exercise on the body?

The worksheet used to scaffold student thinking regarding communication



Observer: _____ Class: _____ Date: _____

Name	Each time a person talks, put in a ✓.

Main comments When you fill in the chart below, do **not** use ticks or numbers. Make a comment like: The most; a lot; the least; frequently; well; not at all.

Name	talking	listening	interrupted others	helped others	how much did they learn?

Other comments

© Brian Matthews, www.engagingeducationco.uk

PLEASE CONTINUE ON BACK