The FACETS project: an experiment in family and community education in technology and science

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Abstract
Children's attitudes are shaped by their experiences both in and out of school. The FACETS Project aims to use the expertise of a teacher-training institution to influence factors such as the attitudes of parents and family towards technology and science.

A series of workshops, run by staff and students of the Centre for Technology in Education, has been offered to children aged 5 to 13 and their parents. These provide a variety of structured design technology, information technology and science related activities, designed and led by students undergoing initial teacher-training in primary education.The project uses links with business and industry to support its work.

This paper details the philosophy and organisation behind the project, and evaluates the impact of the project, at the end of its first year, on the attitudes of parents, children and student-teachers towards technology and science.

Something for everyone?

The staff of the Centre for Technology in Education at Chester College of Higher Education had been discussing the germ of an idea for several months prior to negotiations with industrial partners which enabled the FACETS project to be launched. FACETS stands for Family and Community Education in Technology and Science. FACETS is a 'brand' name for a range of varied activities involving student teachers, tutors, children aged between five and thirteen and their families. Its activities would be publicised in schools and the community.

Several factors were influential in the evolution of the project. Our first consideration was our role as tutors for students undertaking initial teacher training for primary education. Over the past three years we have developed technology modules which require the students to plan and teach a focused design and technology task to small groups of children in schools under tutor supervision. This has proved to be very effective, not only in the development of the students' own technology skills but also in engendering initiative and motivation. We wished to develop other opportunities for students to take responsibility for children's learning as early as possible in their studies. We were also conscious that the practical nature of technology and the general lack of clarity about it within the National Curriculum subject made it hard to guarantee our current student teachers adequate training to cope with the expected changes heralded by the Dearing report. Although all student teachers at Chester College follow a compulsory modular technology course, combining Information Technology and Design and Technology, this aspect of their BEd is taught in their first two years of training. Current third and fourth year students needed the opportunity to update their skills and become familiar with the curricular changes taking place.

Our second consideration was to contribute to the national programme for raising public awareness about, and enjoyment of, science and technology The stimulus and support children receive at home and from their friends is vital to their development. For many parents science and technology was not a major part of their own education. Some feel uncomfortable and uneasy when asked questions by inquisitive children. Through the FACETS project we hoped to demonstrate to parents some practical strategies they could

use at home to support and nurture children's natural curiosity so that they could develop an awareness and attitude towards technology that would enable them to benefit from the school curriculum to a greater degree.[1]

Our third consideration was for the professional development of the Centre for Technology in Education team. As tutors, a shared experience of practical activity with students and children would give us a direct "hands on" feel for the issues of technology education, raise the level of debate, improve our teaching skills and engender research.[2]

Launching the project

Over 200 hundred children and their families came to the launch of FACETS at a Technology and Science activity day organised in partnership with and supported by MANWEB and LEGO DACTA. With a modest budget and much goodwill, the day's programme was designed and redesigned as demand overwhelmed us. The pattern of 'taster' workshops and visiting speakers was reorganised so that the day became an intense half day allowing us to repeat it for a second group of families in the afternoon.

The speakers, an officer from School Curriculum and Assessment Authority and a local designer, spoke to parents while the children were engaged with the Activity Leaders (volunteer student teachers) in the workshops.

The Activity Leaders were organised in teams so that they could adapt the contents of the workshop to the range of ages. There was a ratio of approximately five children to each student and no workshop took more than twenty children. The planning and training Activity Leaders received, prior to the day, helped them to consider how to accommodate the age ranges in their workshop area and bred the confidence to deal with the different levels of ability within the groups. On the day they proved themselves capable of dealing with parent's questions about the purpose of the activities, although each workshop had a tutor whose main task was communication with adults. Dual level workshops also brought logistical flexibility as we were able to respond to different age profiles by swapping workshops from one level to the other at short notice as a result of late enrolments.

After school workshops

As a result of the activity day, we gained our first cohort of families and a valuable database of interested people. Registration for the first after school workshop series was available on the day. Students who had been Activity Leaders were invited to make a longer term commitment to either the Technotot (5-8 year olds) or Young Designer (9-13 year olds) series of workshops. The workshops were based around themes and each group followed similar patterns of organisation based around agreed responsibilities and entitlements.

The weekly pattern for the tutors and students was:

- team meets with a tutor for a planning session
- students prepare and organise resources for workshop
- tutor prepares 'hand out" of information for parents

WORKSHOP - one and a half hours

- student tutor feedback session immediately after workshop
- students write up journals

Personal journals are kept by each of the Activity Leaders. They detail the students' thoughts and concerns as well as document individual children's response to the planned activities. Keeping journals is proving to be a useful tool for the professional development of the students.[3]

During the workshops, parents are encouraged to participate alongside their children and gain an insight into the educational value of the activities. The most popular participatory activities have involved the use of computers to either document design processes or to use graphics packages for designing. Parents also benefit from having the opportunity to chat with the experts about supporting their child's learning at home. As a result of feedback, including questionnaires from parents, structural amendments have been made to the timing of workshops and patterns are starting to emerge.

We have now run three series of workshops (themes have included Making Moving Models, Puppets and Stories, Switches and Computer Control) and have also held a Saturday morning display/demonstration of activities in the town centre where members of the public were invited to participate in a technology activity.

Is it worth it? Indicators of success

Parents' initial attitudes are indicated by their investment in the project and their willingness to give us feedback. A recent "customer" questionnaire indicated that 80% of the families attending the third series of workshops had attended at least two previous FACETS activities. Quotes from the parents indicate they particularly value the educational aspects of the workshops:
" FACETS provides resources to develop my child's making skills" " There are limited opportunities at school to work with computers" " It's a quality, hands on experience for my child'" "She enjoys it and does not realise she is learning"

Many comments also show appreciation for the good organisation and enthusiasm of the student Activity leaders:

> As a teacher I think they (the workshops) are well planned, resourced and paced correctly
>
> Staff very friendly, helpful and patient, she (the child) wanted to continue at home
>
> Very well run course and it was lovely for parents to be welcomed to participate

Critical comments are useful and we have taken steps to remedy some of the faults pointed out by parents, particularly those concerning the degree of supervision of the Activity Leaders.

Students also clearly benefit from the experience. An analysis of the students' attitudes and initial experience of design and technology related skills indicate that they feel under-confident about teaching technology and have not had a wide range of school-based technology experiences before coming to

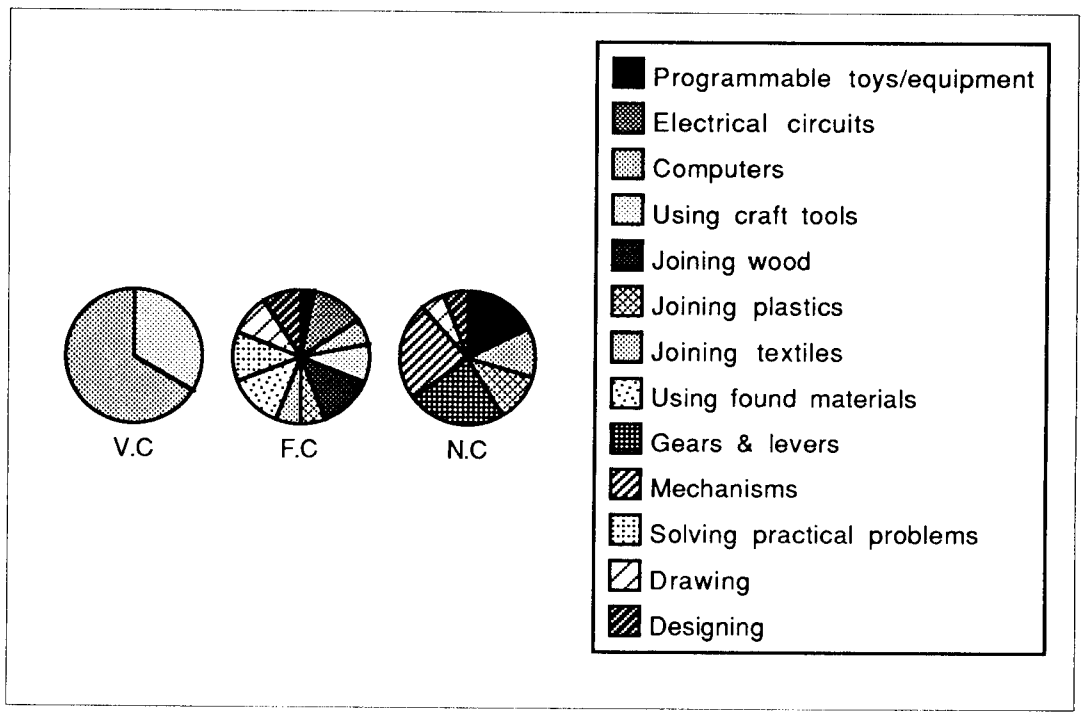
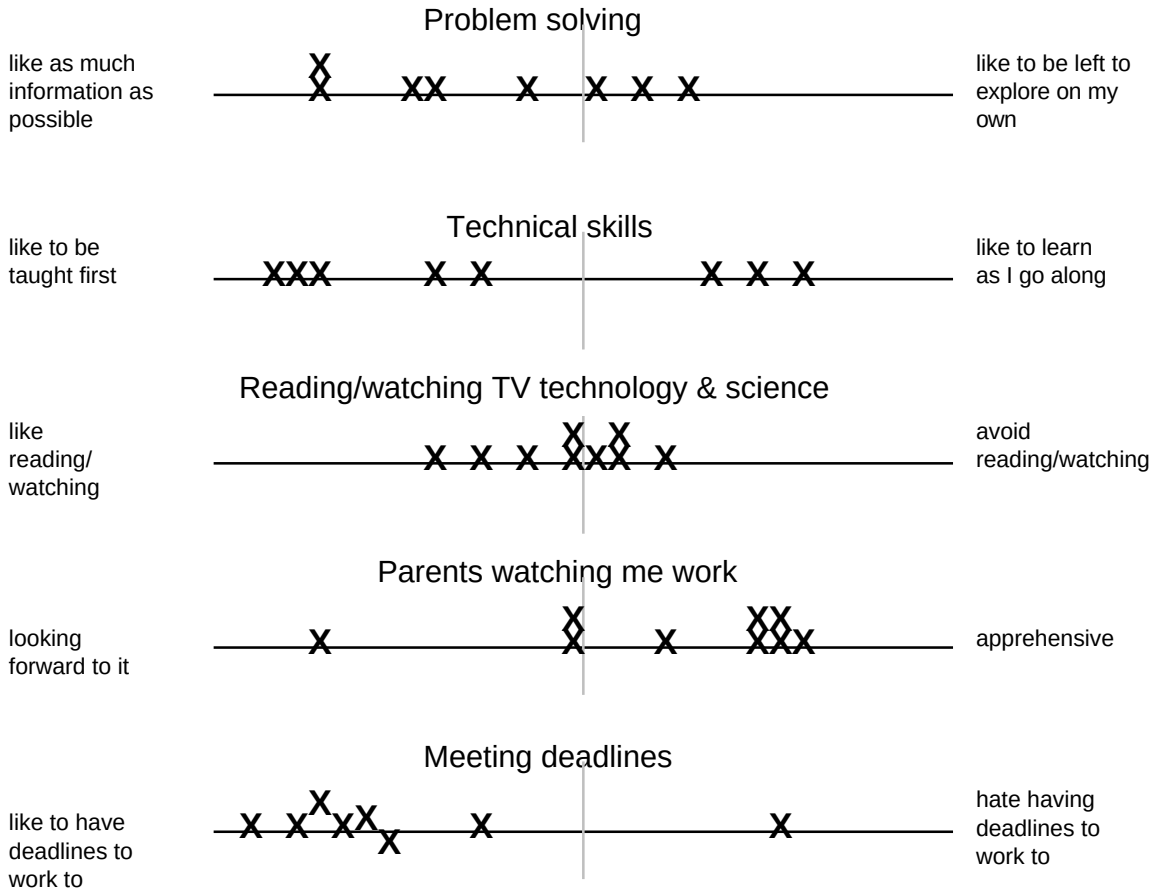


Figure 1
Students' confidence levels in technology before starting FACETS
VC = Very confident
FC = Fairly confident
NC = Not confident

Figure 2

Student's attitudes at the start of FACETS workshops
Students are asked to mark their position along the continuum, each X marks one student response



college. All comment on how confident they feel after involvement in FACETS workshops and how they are learning useful design and make techniques as well as familiarity with a range of computer software packages. Many are using the workshops to practise aspects of teaching methodology they have studied.[4]

What next?

Recently we were delighted to be awarded grant from COPUS (Committee on Public Understanding of Science). This has allowed us to organise Saturday workshops for children and parents who might not be particularly motivated to either visit a Higher Education Institute or engage in education related activities on a voluntary basis. Head teachers are helping us to target the families who might benefit from our FACETS programme.

We hope to increase partnerships with local business and industry in order to support other activities planned for FACETS. Ideas include a residential Technology and Arts Easter school, annual children's lectures and organised visits for families to local industries using interesting manufacturing technology.

Finally, we are in the process of gathering data about the impact of the workshops on children's learning, based on parents' and children's perceptions. The Activity Leader's journals will also provide a rich resource for analysing the effectiveness of such a project on the development of teaching skills for technology. This will influence both our undergraduate teaching and in-service courses.

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