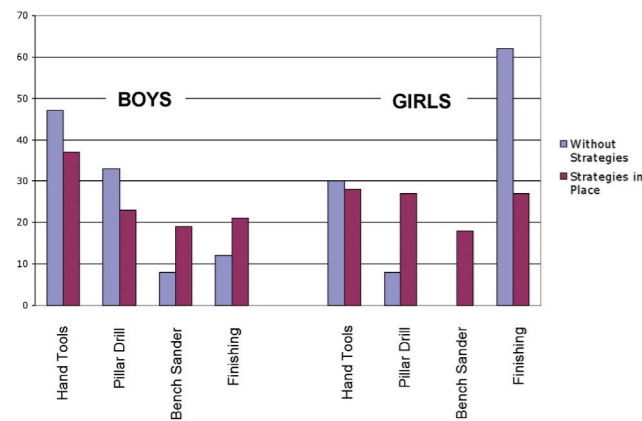


Stage 2

Analysis of the film after several strategies had been put into place revealed positive results. Without strategies in place girls chose to spend the majority of their time undertaking finishing activities. The introduction of a chit system and a gender-balanced approach resulted in both sexes spending a more balanced amount of time on each type of activity. It is interesting to note that boys were reluctant to use the bench sander on the whole when given the choice, but their use of this piece of equipment increased considerably with the strategies in place.



Research Methods

- Textbooks, the Internet, research papers and periodicals were used to conduct academic research into the theory behind gender difference.
- My research was carried out with Year 7 pupils as they had never before experienced lessons in a workshop environment. This ensured an unbiased view on working practice prior to their first practical lesson.
- Pupils were not informed of the filming that took place to ensure that this did not influence their behaviour.
- In order to graphically represent data from filmed lessons the time that pupils spent on tasks was observed and an average time calculated for each sex undertaking each task type. This was then converted into a percentage for conversion to a chart.

Conclusion

The results of my research study provide evidence that employing key strategies will benefit pupils of both sexes in ensuring that their achievement within practical workshop sessions is not hindered by gender difference issues.

Suggestions for Further Reading

Kimura, D. (1992) Sex Differences in the Brain, *Scientific American*.

Maccoby, E.E. & Jacklin, C.N. (1974) *The psychology of sex differences*. Stanford, California: Stanford University Press.

Palardy, J.M. (1969) 'What teachers believe – what children achieve', *Elementary School Journal*, 69.

Stanworth, M. (1983) *Gender and Schooling*. London: Hutchinson.

Acknowledgement

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For up to date information regarding education and gender issues you could also visit:

www.standards.dfes.gov.uk/genderandachievement

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National Teacher Research Panel
engaging teacher expertise

Managing gender difference issues within the Design and Technology workshop


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This summary was commissioned by the National Teacher Research Panel for the Teacher Research Conference 2006, which explored and celebrated teacher engagement in and with research. All conference materials are available at www.standards.dfes.gov.uk/ntrp

Project aims

The aims of this project were to:

- understand the theory behind gender difference - Do boys and girls learn differently? Why?
- research the interaction between girls, boys and the resources and machinery they use within the Design and Technology workshop to identify trends; and
- devise solutions that can be applied in the Design and Technology workshop to overcome gender difference issues and raise achievement.

Study dimensions

This project was undertaken as part of a Gatsby Fellowship relating to a Masters Degree research study. The research was conducted at Cottingham High School, an 11-18 mixed comprehensive situated in the East Riding of Yorkshire. Year seven students were used as the focus for the research that involved academic study, surveys and lesson observation using new media technology.

Summary of main findings

- Academic research into biological, neurological and psychological gender differences reflected that girls and boys do learn differently and gave reasons as to why.
- Girls, and less confident boys, appeared to underachieve within a workshop environment, evident from both surveys and observation.
- A range of strategies could be employed to help overcome gender difference issues and raise achievement, evident through implementation and observation.

Background and Context

Stage 1

Following purely academic study my research took two forms: a survey and observation using new media technology. The survey asked 120 Year 7 pupils (60 girls and 60 boys) their feelings regarding levels of confidence when using hand tools, the pillar drill and the bench sander. My second method for establishing a need for gender balance strategies was to film a class undertaking practical activities for analysis. Pupils were working on the manufacture of 'mini-beasts', which involved a range of tasks requiring the use of hand tools, the pillar drill, bench sander and finishing. The teacher allowed pupils to work where they wanted – there was no seating plan – and pupils were not guided in the tasks they completed.

Stage 2

The results of the stage 1 research, personal experience and prior study in this area enabled me to devise a range of strategies that could overcome the issues identified. To verify the effectiveness of these strategies a further Year 7 class was filmed undertaking the same activities, but this time with some key strategies in place.

Teaching Processes and Strategies

Eight Steps To A Gender Balanced Workshop

The following eight strategies for addressing gender difference issues were devised through research carried out during the first stage of the project and personal experience.

- 1. Ensure that the workshop environment is clean, tidy and stimulating.**
 All pupils, but particularly girls, may respond better to a workshop environment that is well lit, has low noise and dust, modern machinery and stimulating display.
- 2. Present the curriculum and individual projects to pupils with enthusiasm and a non-gender stereotypical approach – manufacture products that appeal to both sexes.**
 Many teachers underestimate the impact they have on pupils' interest and enthusiasm when they first introduce a scheme of work. It is vital that both boys and girls have enthusiasm for designing and making a product.
- 3. Present curriculum materials in a form that will appeal to both boys and girls.**
 Consider curriculum material content carefully when developing it – will the format and content appeal to both girls and boys? Is there a good combination of both diagrams and text within the tasks? Have stereotypical images been avoided?
- 4. Use physical and computer modelling within projects to enable boys to produce quality design development evidence.**
 Boys tend to rush design in order to get to making activities as quickly as possible. Designing needs to be made more appealing to boys - aesthetic results need to be achieved quickly and easily.
- 5. Distribute your attention equally between boys and girls.**
 Girl's lack of confidence is often over-compensated for by the teacher where more help and advice is offered than is actually needed. This has a negative affect on their confidence and consequent achievement.
- 6. Arrange pupils around workbenches in mixed sex groups to improve the quality of interaction between boys and girls.**
 Pupils choose to sit in friendship groups which automatically create a gender difference within the classroom. Teachers often unintentionally reinforce this by referring to groups of pupils as 'lads' and 'girls'. A simple seating plan can overcome this. Apply peer assessment and pupil-to-pupil demonstration techniques to promote interaction between the sexes – the strengths of each sex can then benefit the other.
- 7. Limit pupils to working within an allocated space – allocate tools to specific workbenches to avoid unnecessary movement around the room.**
 Boys can tend to dominate the workshop; strategies need to be in place to prevent intimidation and 'hogging' of tools and equipment. Behaviour issues can also be overcome if pupils' movement is restricted.

8. Employ a 'chit' system when using machinery.

Boys tend to dominate the use of machinery, particularly the most dangerous. This can be easily overcome with the introduction of a 'chit' system to manage pupils' use of equipment. Issue pupils with a numbered card to ensure that pupils take turns at using machines and that equal opportunities are available for all. Frequent skills-based activities and health and safety demonstrations could be consciously employed to increase girl's confidence.

To judge the effectiveness of the above balance of strategies, in the second stage of the project, I filmed a further year seven class but this time with key strategies 5-8 in place:

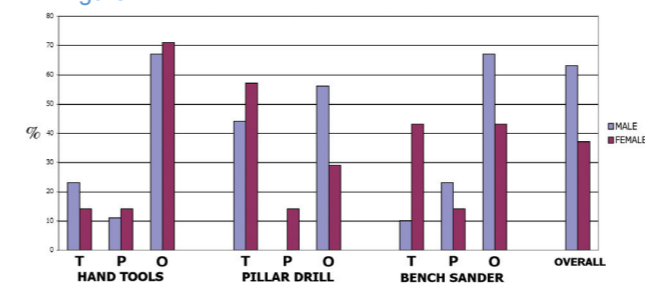
- pupils were positioned around workbenches in mixed sex groups;
- the teacher allocated specific tools and equipment to pupils;
- the teacher was advised to frequently stop pupils and re-focus them on safe working practise and use of machines;
- the teacher was advised to be conscious of how much time he was spending with both sexes and tried to keep this equal; and
- the teacher issued pupils with chits as they required the use of machinery.

Findings

Stage 1

The results of my survey can be seen in Fig. 1. The 'T' columns represent the pupils who felt confident in using equipment if a teacher was close by, the 'P' when a pupil was nearby and the 'O' with total independence. The results demonstrated that girl's confidence dropped considerably when using machinery independently, almost twice as many boys feeling confident in using equipment on their own with no support nearby.

Figure 1



Pupils had the option of making a comment about what they liked/disliked about lessons in the workshop. As expected, most girls made comments referring to their dislike of the dust in the workshop and the larger pieces of equipment that seemed dangerous. Boys also made comments about the dust and noise. It is not just girls who have the need for strategies to improve confidence, there are many boys who also lose out to those with more confidence in the workshop.

Figures 2 and 3 show how the boys and girls in the filmed class chose to distribute their time amongst the practical tasks.

Figure 2
Boys Activity Choices

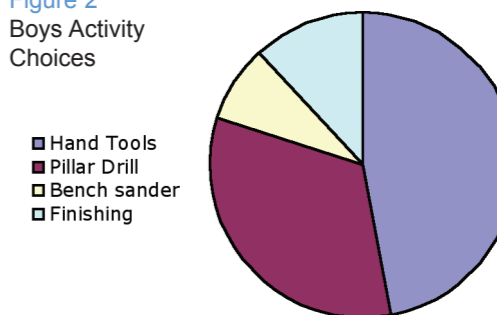
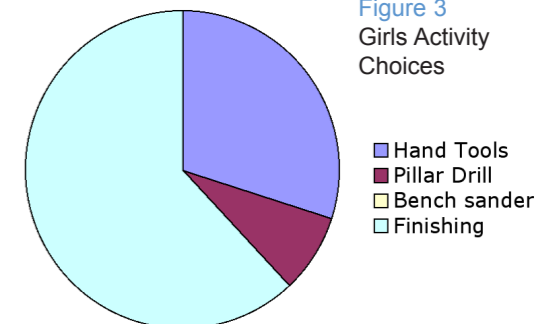


Figure 3
Girls Activity Choices



Analysis of the film during stage 1 enabled me to draw the following general conclusions:

- girls have a preference for painting and light hand finishing tasks;
- boys have a preference for tasks involving hand tools;
- girls will avoid using machinery if permitted;
- boys least enjoy using the bench sander;
- if girls do undertake activities involving hand tools or machinery they rarely do so independently;
- girls support other girls when undertaking practical activities and boys support other boys, but rarely is support voluntarily offered between sexes
- girls and boys choose to work in same sex friendship groups;
- boys who lack confidence in the workshop tend to react to practical activities in the same way as girls and choose to work near to or with girls;
- girls tend to use limited workshop space;
- boys make full use of the workshop space and equipment available;
- boys will take tools from other workbenches without requesting permission;and
- boys tend to receive more teacher attention.