

Equality Issues Present in Teaching and Workshop Interaction

A major difficulty faced by anyone wishing to research equal opportunities issues associated with National Curriculum design and technology lessons taught in a workshop environment is the paucity of literature available. However, new data from a recent LEA-sponsored initiative (Newley¹ LEA 1995-1998) now provides additional material on the range of equality issues present in workshop-based teaching and interaction. The researcher's role in the Newley Design and Technology Initiative (1995-98) was that of evaluator, and this paper describes the Initiative's evaluation process and the research findings it produced. In so doing, it aims to inform the ongoing debate regarding gender issues in design and technology. It also provides teachers with practical information on strategies for evaluating aspects of their workshop-based teaching, which hopefully will encourage teacher-initiated research.

The Newley Design and Technology Initiative (1995-1998)

Background

New orders for technology in 1995 (retitled design and technology - DFE 1995) maintained option choice at the end of Key Stage 3, and raised the possibility of option choices once more being differentiated along gender lines, as had been the case prior to the introduction of the National Curriculum. The view of teachers and officers employed by Newley LEA was that the most likely way to combat pupils' stereotypical choices at the end of Year 9 would be to promote vigorously the provision of equal opportunities in design and technology lessons at Key Stage 3, particularly in workshop-based activities. Out of that thinking emerged a three-year initiative, the aim of which was to develop a design and technology curriculum and working environment for the workshop-based elements of the subject which gave boys and girls equal opportunities to develop their abilities, and which did not encourage or reproduce the traditional stereotypical associations of certain aspects of technology with a particular gender.

The Initiative in schools

Newley is a metropolitan borough situated on the outskirts of a large industrial city in the north west of England. The Newley Initiative (1995-98) involved two mixed 11-16 comprehensive schools, referred to in the research as North School and South School, each with approximately 800 pupils. There was one pilot group of mixed ability pupils at each school (North School, 18 pupils and South School, 20 pupils), and the Initiative involved the same group of pupils across three years (Year 7, Year 8, and Year 9).

The two Initiative schools determined their own curriculum material and were equal partners with the LEA on the co-ordinating group, which planned and managed the research strategy. In essence therefore, the Initiative comprised school-based action research, but with significant LEA support and dissemination across the LEA's secondary schools.

The evaluation strategy

The purpose of the evaluation strategy was to assess the extent to which the Newley Initiative (1995-98) achieved its aim. Planning took account of current National Curriculum design and technology requirements (including non-statutory guidelines), ability issues highlighted in the final report of the APU's 'Assessment of Performance in Design and Technology' project (SEAC/EMU 1991), the areas of consensus on delivering gender equality identified by authors, and my previous experiences as an evaluator.

In order to do this, the researcher synthesised the key areas of agreement/disagreement identified by authors. That process revealed a total of nine areas, and the evaluation strategy adopted was to use those nine areas (termed indicators of gender equality) to analyse the various data sources used in the evaluation. The indicators of gender equality were not identified to, or discussed with, the Initiative schools because both parties (schools and LEA) agreed that schools may then have been influenced (intentionally or unintentionally) by them when developing aspects of their Key Stage 3 design and technology curriculum.

Indicators of gender equality

Indicator 1 Levels of interest displayed by girls and boys in the curriculum projects.

Indicator 2 Levels of interest displayed by girls and boys in the various aspects of design and technology activity (ideas, design and make, focused activities).

Indicator 3 The curriculum presented to boys and girls by what the teacher says.

Indicator 4 The distribution of teacher attention between girls and boys.

Indicator 5 The use of equipment and machinery by boys and girls.

Indicator 6 The curriculum materials presented to pupils.

Indicator 7 The use of space within the workshop by girls and boys.

Indicator 8 The quality of interaction between boys and girls during workshop-based lessons.

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Indicator 9 Attitudes towards the quality of the physical environment.

The data sources

The key players in the Newley Initiative were the pupils, teachers, and the evaluator, and it was their perspectives on the degree to which equal opportunities existed in workshop-based teaching and interaction that the researcher endeavoured to discover. It would be achieved by filtering data from those three sources across the nine indicators of gender equality. To acquire the appropriate data, ethnographical research methods were used involving a combination of observation, interviews, questionnaire, analysis of documentary material and video-recorded material. That process involved the key players as follows.

The pupils' perspectives

Having given due consideration to previous experiences as an evaluator of school-based research (when attempting to construct an appropriate standardised test, unsuccessfully, pupils' reluctance to discuss issues when faced with a microphone had hindered progress), the researcher chose to gather data on the pupils' views using a non-standardised questionnaire. It was designed when administered to both pilot groups at the end of the Initiative in June 1998. It contained 23 questions requiring 84 responses and was graded on a four-point scale. Supplementing the data from the pupils' questionnaire were my field notes, made throughout the three-year period, following informal often short discussions with pupils during 'hanging about' sessions in the schools' design and technology departments.

The teachers' perspectives

In discussion with the Initiative teachers, an explanation of the difficulties associated with trying to record teacher observations using field notes made during or just after lessons was given, and time was requested to be set aside for specific interviews. Both teachers agreed, but considered producing a written record of an interview would result in a slow disjointed process and, inevitably, to selection of what was recorded by the interviewer. Hammersley and Atkinson (1995) saw the inevitable trade off between depth and breadth when producing field notes (the more detailed the record, the narrower the range of issues covered) and suggest the use of a semi-focused audio-recorded interview. This enabled the researcher to raise open-ended questions on curriculum and gender-related issues while, at the same time, enabling the teachers to raise and expand on any issue they considered pertinent to the evaluation of the Initiative's aim. Interviews took place at the

end of the Initiative in July 1998 covering the following issues.

Semi-focused interview

Part A – issues related to teacher's role as head of department:

- strategies the department has adopted over the past five years to ensure equality of opportunity
- how the other members of the department teaching workshop-based design and technology support the equal opportunities strategy
- identify which aspects of the department's equal opportunities strategy have been successful and which have not; give reasons
- aspects of the department which have not been subject to assessment for provision of equal opportunities
- in-service provision which has supported the department's equal opportunities strategies
- the extent to which the department's policy of allowing each teacher to decide their teaching style is comparable with the department's equal opportunities policy
- how the department reviews the impact, in practice, of the equal opportunities policy on teachers and pupils.

Part B – issues related to his/her role as teacher of the Initiative group:

- describe the strategies you have adopted over the past five years aimed at providing equality of opportunity for all boys and girls taking workshop-based design and technology courses (including the Initiative group)
- identify the degree to which aspects of your equal opportunities strategy have been successful
- the extent to which the selection of projects at Key Stage 3 has been compatible with the department's equal opportunity policy
- describe your teaching style and discuss to what extent it facilitates equal opportunities for all girls and boys
- gender differences in the strategies adopted by girls and boys in the design and technology process, how do you respond to those differences?
- outstanding issues preventing equality of experience for girls and boys.

The evaluator's perspective

Observing lessons during previous involvement in educational research and, as

an OFSTED Inspector had revealed, the difficulties encountered in selecting and recording appropriate observations where personnel are constantly on the move in a workshop environment. Those difficulties must have resulted in many omissions of relevant data, particularly of devious behaviour. Another concern involved the time-consuming nature of lesson observations. Since it was considered necessary to observe teachers' and pupils' behaviour throughout all stages of designing and making (from ideas to artefact), the researcher was faced with an ongoing sequence of lessons involving between 12 and 20 hours of observations at each school, which was not a realistic proposition given other professional commitments.

The solution adopted involved video-recording the lessons. Both schools allocated their largest workshop to the pilot group. Consequently, it was possible to situate a high-quality video camera unobtrusively in the corner of the workshop at ceiling height to provide a constant picture of the whole workshop area occupied by the pupils. The camera was positioned and activated by the department's technician before the pupils arrived at the workshop. This process provided a detailed and accurate record of 28 lessons (North School 12, South School 16). Analysing the taped material proved extremely time consuming (on average, over six hours per 55-minute lesson), but did enable the search for evidence appertaining to the nine indicators of gender equality.

Evidence from the taped lessons also proved invaluable on the occasions when engaged in participant observation as part of the 'hanging about' strategy. It enabled the researcher to ask informed questions about the pupils' work and pursue issues highlighted on the video-recordings. This two-pronged approach adopted for gathering lesson observation material proved an effective evaluation strategy.

Analysing the video-recorded data

Significant data emanated from the video-recorded lessons because of the wealth of material contained on the tapes, and the opportunity provided for unlimited revisiting of the material. The difficulty, however, was deciding how to select material which provided relevant data in order to arrive at sound inferences and judgements applicable to the nine indicators of gender equality.

Following further reading (Wragg, 1994 and Foster, 1996), it was decided to adopt a six-stage strategy for sifting the material and analysing the data contained in each video-recorded lesson.

Stage 1

Observe the video-recording frozen at incidents which were pertinent to the nine indicators of gender equality.

Stage 2

Convert each frozen visual incident into a written transcript.

Stage 3

Analyse the written transcript and make judgements as to whether, and to what degree, the recorded activity provides appropriate data.

Stage 4

List the recorded judgements made at Stage 3 against their associated indicator of gender equality (noting their recorded time on tape).

Stage 5

Rerun the video-recording in order to confirm judgements made at Stage 4.

Stage 6

Rerun the video-recording and focus attention on the remaining material not identified in Stage 4 as a means of checking that valid material has not been overlooked. It also provides an opportunity to discover any material pertinent to gender equality issues, but outside the remit of my nine indicators of gender equality. No new indicators were identified, but the quantity of material associated with pupils' body language was an unexpected bonus.

The second evaluation strategy involved gauging the departments' effectiveness towards providing a gender-neutral environment. Determining an appropriate strategy proved difficult and eventually Foster's (1990) 'hanging about' approach was adopted, which involved spending at least two half-days per term at both schools throughout the three-year Initiative. For much of the time, the researcher observed and talked informally to pupils and staff in an attempt to internalise the atmosphere towards gender equality within the two departments. Of particular interest were the subject perspectives of the two workshop-based teachers in both schools not involved in the Initiative, as it was important to assess the general attitude within the departments towards actively promoting equality of opportunity and compare the influence of teachers who did not teach the pilot groups with those who did. Thus a significant proportion of time was spent engaging with those teachers in a variety of settings (morning break, lunch break, after-school clubs, and occasionally assisting with teaching groups). Those discussions lasted from a few minutes to over half an hour with salient comments being recorded as field notes as soon as possible after the event.

Of the three strategies used by the researcher, gathering evidence on documentation and resource literature proved the most straightforward. Copies of every document used by the design and technology departments throughout 1995-98 along with the minutes of departmental meetings, current text books, and other resource literature including a copy of the schools' equal opportunity policies were made available. Their scrutiny, along with the data provided by the video-recordings and field notes, constituted the researcher's perspective.

This research model, designed to illicit the perspective of pupils and teachers, provides the evidence base for determining the degree to which the teaching and workshop interaction occurring in the two Initiative schools achieved the Initiative's aim of providing gender equality in design and technology at Key Stage 3.

Equality issues revealed by the evaluation data

Full analysis of the data and the resulting range of gender issues across the nine indicators of gender equality are available (Withey, 2000). However, demonstrated below is how data generated by the Newley Initiative can inform the equal opportunities agenda in workshop-based teaching.

As an example, data related to two indicators of gender equality. The first example (indicator 3) shows the first stage in gathering information on the perceptions of the pupils, teachers, and the researcher, and also the video evidence. In the second example (indicator 1), evidence from the first stage is collated to provide an overview of equality issues pertinent to the indicator.

Indicator 3: Teacher presentation North School

Researcher's perception:

- with boys used instructional language
- more supportive and time-consuming with girls.

Pupils' perceptions:

- helpful on a one-to-one basis
- praise highly appreciated
- pupils concerned with frequent shouting
- boys disliked amount of teacher instruction.

Video evidence:

- used gendered terminology
- always responded to pupils (usually boys) who called out questions
- displayed stereotypical approach in aspects of teaching.

Teacher's perception:

- he was equally supportive to boys and girls, but boys and girls had different support requirements.

South School

Researcher's perception:

- scrupulous in balancing boys' and girls' involvement during whole-class activities
- no difference in approach when supporting pupils in construction.

Pupils' perceptions:

- gender equality in terms of teacher support with designing and making activities
- girls appreciated his encouragement and one-to-one help using equipment.

Video evidence:

- all boys and girls have different support needs irrespective of gender
- discussed targets with each pupil at the commencement of each lesson.

Teacher's perception:

- gender equality existed in so far as he meticulously adopted the same presentation style for girls and boys.

Indicator 1: Levels of interest displayed by girls and boys in the Curriculum projects

Pupils' responses confirmed two thirds of projects as being gender-neutral. They included pull-along toys, games (using CNC machinery), moving displays, exotic insect models, 3D jigsaws, personalised containers, and the batch production of a clock. Projects identified as gendered largely favoured boys' interests, and one school employed a small number of gender-focused tasks as a means of holding boys' interest and thereby keeping them on task. What emerged as a key strategy for identifying gender-neutral topics and projects was the early involvement of pupils in choosing the topics and projects they wished to pursue. Not only did it facilitate gender neutrality, but the sense of ownership it engendered in pupils increased their motivation. One school recorded improved attendance by girls at design and technology lessons.

The Initiative's main findings

The equal opportunities issues recorded in the Initiative's evaluation report identify the varying degrees of success achieved towards providing gender equality. It also reveals elements contributing to gender inequality. By drawing together the aspects on inequality, the report identifies the key cause of inequality in design and technology lessons. Around one third of projects at both schools were identified as gendered, but, as some of the

gendered projects (at South School) were incorporated in order to hold boys' interests and keep them on task, the underlying reason for some gendered projects was the management of boys' behaviour. Anxiety about boys' behaviour during construction activities influenced some girls to spend longer than necessary on design tasks. It led teachers to assume girls preferred designing to making. However, data from the pupils' questionnaire showed girls' strong commitment to both designing and making. Both teachers managed to provide quality in the distribution of their attention, but that was by chance rather than by design. Time required to respond to unplanned demands, usually caused by the behaviour of boys, could have resulted in gender inequality for girls in accessing the teacher's attention. Boys were also often the cause of gender inequality for girls in accessing equipment and machinery, unless management strategies existed (as at South School) for controlling pupils' access to resources. Aggressive behaviour of boys while exploiting the freedom to move around the workshop space generated considerable anxiety for some girls. Their response was often to devise coping strategies, such as grouping together around a bench and moving about the workshop in pairs. Data relating to six of the nine indicators of gender equality identifies boys' behaviour as a significant contributor to gender inequality in the workshops at both schools. Boys' behaviour frequently influenced, and sometimes subtly controlled, the teacher's behaviour by forcing him to adopt coping strategies. By identifying boys as the main cause of gender inequality and illuminating the actions associated with boys' gendered behaviour, the Newley Initiative provides worthwhile data for use by teachers in planning and delivering lessons.

The way forward

The Newley Design and Technology Initiative demonstrated the effectiveness of school-based research in identifying and responding to equal opportunity issues. It also confirmed the enhanced benefit arising from LEA involvement in school-based research by placing LEA resources at the disposal of the Initiative schools, while ensuring all the LEA's schools gained from dissemination of research materials.

Promoting school-based research was the reason the Government established practice research scholarships for teachers in 1999. They enable practising teachers to research aspects related to their teaching and classroom environment in order to improve their professional competence. The researcher has a strong belief that the professional

development of teachers is the key to delivering curriculum innovation and, currently, best practice scholarships provide teachers with such an opportunity. Therein lies the way forward for facilitating equal opportunities in National Curriculum design and technology.

References

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- 1 Newley is a fictitious name representing a North West metropolitan borough
 - 2 Foster (1990, p.21) defined 'hanging about' as being involved in 'observing lessons, occasionally helping out (in lessons), but more often watching and noting down the things (he) saw... often spending breaks and lunchtimes chatting and listening ... and attending staff meetings and INSET sessions.'