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ABSTRACT

A study was conducted to explore the way that gender bias operates with 9- and 10-year-olds, and to propose ways in which gender equality and cooperation may be promoted through classroom interventions. Groupwork with computers was the curriculum area selected for study because computers are a symbol not just of technological progress, but of male power. The research was conducted in two stages. The first stage was a pilot study during which research techniques were tested and data analysis informed the development of intervention strategies to promote equal opportunity for males and females. These strategies were implemented in the second stage, with a different teacher who had much greater interest in gender issues. Observation and interviews were the main methods of data collection in both studies. The study concluded that collaborative group work is in itself an effective way of encouraging equal opportunities, if children, and especially boys, are encouraged to focus on their partners as well as the task. The problems of differential achievement of females and males, and working class and middle class children were addressed in the study, along with the issues of conflict, competition, interest, role models, and teacher intervention. (AC)

HE, SHE AND I.T.

Groupwork in a Gender-Sensitive Area

ABSTRACT:

The paper reports work carried out in the ethnographic tradition by the author as part of the joint University of Sussex and University of London Institute of Education project **Groupwork with Computers.** It looks at intervention strategies that were adopted to promote gender equality and other gender issues which emerged from the study. A main conclusion is that the establishment of collaborative groupwork is in itself an effective way of encouraging Equal Opportunities. This can be done by encouraging children and especially boys to focus on their partners as well as the task. The problems of differential achievement of female and male, working class and middle class children are addressed and the issues of conflict and competition, interest, role models and teacher intervention are discussed.

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Groupwork in a Gender-Sensitive Area

Statistics show that:
- *more boys than girls use computers;*
- *parents are more likely to buy a home computer for boys than girls;*
- *computer games are aimed at a male market;*

Boys often see computing as an interesting hobby and so become familiar with the technology and use the jargon which is discouraging to those unfamiliar with it...
In mixed schools boys often dominate computer activities.
[National Curriculum Council (1990) Non-statutory Guidance for Information Technology Capability p.B5]

The work reported in this paper takes as its starting point the idea that because of the status of the computer within our society as a male icon, information technology in schools is a gender-sensitive area. Not only is there greater male interest in computer hardware [Culley (1990)], but the mass media and society in general strongly present a view of computers as male, women featuring usually in subservient roles or as sex-objects [Hoyles (1988)]. Even in the relatively female-biased atmosphere of the primary school, the computer consultant tends to be male, as more men are drawn to seek training and experience [Hall and Rhodes (1986)]. Boys' greater confidence encourages their emergence as class 'experts', acknowledged either by teachers or by other pupils [(Crook (1987), Hall and Rhodes (1986)]; girls are more likely to ask for help from boys than vice versa [Siann and Macleod (1986)].

My research represents an attempt not just to explore the way bias operates, but to propose ways in which gender equality and co-operation may be promoted. It was undertaken initially as part of the ESRC/InTER Project *Groupwork with Computers*. My role was as a Teacher Researcher, collecting and analysing data based on the practice of two Teacher Practitioners working at the primary school where I teach, in a small town near the south coast of England. However, unlike the other Teacher Researchers in the Project, I was not employed full time at school, but was also working for a degree at the University of Sussex; added to the demands of the Project there was my own agenda.

Gender issues did not feature directly in the research questions of the Project as a whole, however they were an aspect of groupwork that was mentioned specifically in the proposal as one of several particular areas of enquiry. The research questions which I addressed in my doctoral thesis were as follows:

a. What strategies can teachers adopt to promote Equal Opportunities in groupwork with computers?
b. What gender issues emerge when children are working in groups within this gender-sensitive area?

The way the research was conducted was therefore necessarily a compromise between the demands of the main project and my own interest. It took place over two school years and involved two classes of nine to ten year-olds, taught by two different teachers, Andy in the first year and Sally in the second. The computer work was mostly with Logo and Tray.

Project Design and Methodology

There were two stages to the work; initially, in the Pilot Study, I was working with a teacher practitioner who was not especially interested in gender issues. His class was divided into groups of two, to give the maximum number of combinations of gender and ability (based on attainment in a test). The children were observed, they filled in mini-questionnaires following computer sessions and they were interviewed individually. There were three main objects of this pilot study: first, to allow me to try out research techniques and gain some expertise; second, to gain insight into what were the relevant gender issues; and third, to use the analysis of the data collected as a starting point for developing intervention strategies to promote equality of opportunity. These were then implemented in the second stage, the main study, with a different teacher practitioner who had a much greater interest in gender issues. Observation and interviews were again the main methods of data collection.

This summary gives the work a false air of neatness. The first stage was rather messy, not only because of my inexperience as I attempted to use unsuitable methods of gathering data, but also because problems with the health of both teacher practitioner and class computer restricted the amount of time available to gather data! The main study was rather more complex than is suggested, because far from being a laboratory-style experiment, isolating and controlling variables, it was a piece of qualitative research in the ethnographic tradition with an element of 'action research'. Both the teacher, and most importantly the children, were seen as part of what became known as the 'research partnership'. The interventions initially planned were therefore adapted, extended and added to during the course of the year.

Sally's involvement in this was not problematical: she was anxious to promote gender equality and keen to receive feedback from me, so we worked together in deciding subsequent directions. However, the children's involvement needs a little more clarification: they were invited to participate in a number of ways that are outlined below.

Pilot Study Findings

Given the general acceptance of male domination in computer work, the picture that emerged from Andy's class was unsurprising. Despite many of complicating factors resulting from the specific context of the class, there was strong evidence of boys' greater enjoyment, motivation and success. A schematic overview of the domination in the class revealed a pecking order, where ability and gender were the most important elements: those at the top of the list were the most dominant, those at the bottom the least:

Able boys
Less able boys
Able girls
Less able girls.
Special needs children.

The attitude of the teacher was seen as a critical factor. Despite his willingness to take part in a gender study, he did not think a lot about Equal Opportunities. When asked to do so, he had an expectation of differences between girls and boys.

> *I think the girls tend to interpret the boys as being better at it because they're touching it more, making it do things, even though they may be making mistakes, there's more going on, the boys seem to be more familiar with it, ... (the girls) perceiving themselves as not competing so much with boys on equal terms; I think they allow themselves to take a back seat, to be shoved into a back seat.*
> *[Interview with Andy]*

Attitudes to process and goal showed a gender difference. Each was important to boys and girls in different ways. For boys, a sense of purpose came from the achievement of the goal and the process was important because it allowed them to work with the hardware, pressing buttons and making things happen. For girls, the goal was important if it seemed to lead to an interesting application, whilst the process was significant because it enabled a sense of sharing with a partner.

The pairings were selected by the teacher with no reference to friendship patterns. Most of the children said that being friends with a partner was important. By upper junior level children are usually able to judge for themselves which pupils of their own sex they get on with, however their ideas of which of the opposite sex they would work well with may not be so reliable; had they been allowed to choose, some of the most fruitful groupings would not have taken place. As the boy in the most successful pair said:

> *It wouldn't have been a pair that I would have chosen but it was OK. [Interview with Sebastian]*

The idea that girls necessarily work better in single sex groups was not indicated by this study. Only two of the four all-girl groups allowed both partners equal access to the work and only one of those pairings worked collaboratively. However working with a boy was no better: in only three or possibly four of the eight groups was the girl happy with her lot. The boys in the more successful groups were all working with girls.

The interaction of personality and ability factors was considered important. Two equal ability assertive girls were able to work together, whereas similar boys were not. In the girls their assertiveness did not include a desire to shut out their partner and monopolise the work, yet in every case where a boy was the more able he marginalised his partner and solved the problems by himself. The personality quality which was evident in all the boys in groups which worked well was that of sensitivity to their partner.

Little successful collaboration was observed or reported. Whilst this was a problem for all pupils, in most mixed groups it worked particularly to the disadvantage of girls. Observation of these children previously would suggest that it was not because they were unable to work together in this way. One explanations for this was that there is little transference of groupwork skills off the computer to those on computer perhaps because the machine itself got in the way of collaboration by providing a focus that was stronger than the need to communicate with the partner. Alternatively, it could have been the novelty of the computer in this their first major contact with it, that was the significant factor: with more practice they might have considered the situation normal and been able to apply groupwork skills learnt elsewhere. Possibly the most convincing reason for the lack of collaboration was that children were not using groupwork skills because they were

out of practice: Andy was wary of groupwork and almost all their other work was of an individual nature.

Factors such as gender, ability, friendship, assertiveness and sensitivity all need to be taken into account when making groups. This calls into question the idea of two as a suitable size for a group. The analogy of a pair of scales is perhaps appropriate: when trying to achieve a balance, it is much easier when there are more elements to weigh against each other - two are either in equilibrium or not.

Intervention Strategies

The Pilot Study confirmed that if Equal Opportunities in groupwork with computers is to be achieved, then positive action is needed, not only with respect to the specific tasks set, but also in establishing a classroom culture which nurtures collaboration and gender equality. This led to a number of intervention strategies in the main study. Although these can be viewed and discussed separately, it is difficult to evaluate each exactly: my suspicion is that, rather than any individual policy being especially effective, it was their interaction and the totality of the approach that mattered.

In Sally's class there were still gender differences to be seen but on the whole the year's work was exceptionally successful. Both girls and boys were mostly able to transcend gender stereotypes and a class culture was created which enabled individuals to achieve their potential.

Building group culture

The difficulty in trying to create Equal Opportunities in schools is that society as a whole is not equal: gender, race, class and other oppressions are rife. In order to combat this, it is not enough for teachers to impose a counter culture on children, as this may only lead to accommodation or resistance. Instead, children need to be given the task of creating their own counter culture, within a context defined by the teacher, but subject to negotiation. The main method by which we attempted to do this was to create four groups, taking into account gender, ability, assertiveness, sensitivity and friendship. The groups were chosen by the teacher, but the children made a written input by saying whom they would like to work with and whom to avoid. These groups were fixed for the year, although one child tried two groups before settling down with a third, and were used for most of the class's work. Groups of seven were, however, too large for many activities (e.g. actually working

on a computer), so they necessarily had to split up on occasions. The creation of these subgroups was the responsibility of the children themselves. Each group created its own subculture and an important part of my analysis of the year's work was to look at the way each of them developed.

Partner-Focus and Task-Focus

A difference between working in groups and individually is that in groupwork there is an extra focus of attention. When alone attention is directed towards the task, whereas in a group it may also focus on one's partners. These two foci produce a spectrum: at one extreme is the person who is so oriented towards task completion as to be oblivious of other group members, at the other is the person who is so concerned about what is happening to the other members of the group, that they apply themselves almost exclusively to satisfying the needs of their partners. Obviously it is possible and even normal to change one's focus whilst working, but it is also possible to characterise an individual as, to a varying degree, task- or partner-focussed. When children are engaged in individual work, to be task-focussed is obviously an advantage. In groupwork, the balance between task- and partner-focus becomes important. If it is exclusively on the task, there will be no collaboration, with each person pursuing their own line of enquiry, a process observed in some of the less successful Pilot Study pairings. If the emphasis is exclusively on partner-focus, then the activity could lose its way, lacking direction and becoming pointless. Although it is possible to think of examples of these extreme cases, in practice it is usually a question of seeing in what ways the two intersect. Moreover, the two dimensions are not really equal. Whilst task-focussed workers can lack any interest or identification with their partner, it is less usual for partner-focussed workers not to be aware of their task. It is useful therefore to talk of a task-focussed approach meaning one which concentrates on this to the exclusion of considerations of partner, whilst reference to partner-focus does not necessarily preclude lack of involvement with the task.

The idea that boys tend to be task-oriented, whilst for girls the process is more important, and also that girls relate more closely to each other is strongly supported both in the field of IT [e.g. Nielsen and Roepstorff (1985) and Sutherland and Hoyles (1988)] and more generally. This was also indicated by the Pilot Study.

Four types of intervention were made to encourage partner-focus especially in boys. Most simply the teacher sought always to make good collaboration a goal of each groupwork task. At the beginning of the year this might involve building

consultation of the rest of the group into the task as set; later on it was usually abbreviated to an injunction that it was really important to co-operate and see that nobody get left out. Another fairly obvious way of interceding was to make a policy of praising children for their groupworking skills more than for the product. The third kind of intervention was deliberately to raise groupwork issues through group training exercises such as Collaborative Squares, with children not only participating themselves but also observing other pupils. The last type of intervention was the children's involvement in the research partnership. This took several forms: fairly frequent discussions with the whole class, groups and individuals reinforced the message that group issues were important. The children were involved in creating the questionnaire whereby they commented on each computer session. In the last term they were also asked to become involved in structured observation of each other. Children knew of my interest in group processes including sex role but to prevent their giving it undue prominence I did not tell them that gender was the specific focus of my study. Whilst it may not be possible for teachers to replicate this last intervention strategy exactly, they can use similar devices - questionnaires, conferencing and group discussion - to encourage reflection and evaluation of groupwork in their class.

There was a general shift over the year to a more partner-focussed approach in all children, but particularly amongst the boys who initially found it hardest. The importance of this was underlined by the fact that the success of a mixed gender group was likely to depend upon a non-stereotypical, partner-focussed attitude in boys, rather than on any attribute of the girls, although the effect was less significant when girls were in the position of most power in the group.

Role Models

The status of computers as symbols of masculine power means that even partner-focussed boys are liable to hold views which make it difficult for them to work well with girls. The experience of girls may also lead to low expectations on their part. One strategy to counter this was a series of visits to the class by women involved in IT. In an effort to adopt a more 'girl-friendly' approach [Whyte et al. (1985)], experts from traditionally male fields such as engineering and construction were avoided. The visitors talked to the children and worked with them. The fact that the teacher practitioner herself had become the school's IT co-ordinator also helped in providing a positive female role model; she and I were careful in our dealings with each other to reinforce this effect.

Discussion and other work on gender role was also seen as a deliberate intervention. The children took part in a number of projects which raised the issue as well as being encouraged to talk about it when it occurred spontaneously.

The success of these two strategies can be seen by th way the children were prepared to challenge each other's behaviour and by the response of one boy who, when asked to say what he thought a computer expert would be like, started the sentence with the word 'she'.

But if girls lack positive role models in IT so do boys, with computers often associated with the aggression of video games or the reclusive obsession of the programming buff [Siann et al. (1988)]. This was tackled by giving special encouragement to pupils of both sexes who emerged as class experts and who could focus on the needs of other children rather than just being able to work well with the machine; they too acted as positive role models. In addition two boys whose behaviour did fit the negative stereotype pattern were asked to work by themselves until the rest of their group invited them back.

Other Issues and Unplanned Strategies

Perhaps of even more interest than the planned interventions were the other issues and responses that emerged during the course of the year.

Conflict

A view expressed in much research [notably Askew and Ross (1988) and Spender and Sarah (1980)] is that conflict is characteristic of a male approach ; others note that conflict within groupwork is something that all children find very difficult to cope with, so that debate is often stifled [Prisk (1987). Galton and Williamson (1992)]. Within Sally's class a gender difference in children's attitude was noted: boys were less able to differentiate between debating different ideas and quarrelling. However the effects of this difference were minimised by two features of the teacher's methods: first, by having a very relaxed attitude to classroom noise, which included accepting and welcoming children showing emotion; second, by placing emphasis on the process of groupworking, rather than on task completion and on partner-focus as opposed to task-focus.

Conflict between the sexes also emerged as an issue. Som of this was of the negative type observed by, for example, Sheingold, Hawkins and Shar (1984) and

Cavendish (1988), but more frequent was cross-gender 'jousting' where children who were, or who became, good friends indulged in good natured teasing, which both parties enjoyed and became a motivating factor in groupwork.

Contrast

Whereas contrast had often proved a problem in the Pilot Study, many of the most successful subgroups in Sally's class included children with contrasting abilities and styles of working. This was explained by the commitment of the children to heterogeneous groups:

> *I think we have kind of mixed abiiities which makes it ..... so that if it's more mixed we can do more things..... because we've all got different ways. [Interview with Anthony]*

Along with their teacher they valued their achievements more highly if accomplished with children they perceived as different: her promotion of this ethos, as well as the fact that the children had been together for a long time and so knew each other well, were seen as contributing to this attitude.

Achievement

In a Logo test in the Pilot Study boys achieved much better results than girls. In the Main Study similar tests showed little significant difference when taken together, although boys did slightly better in the earlier one. Any expectation of boys' higher achievement in activities such as Logo proceeds from the conditions of working and nature of the tasks set and is a function of the expectations and bias of the organiser of the work. This has been argued a great deal in feminist research over the last fifteen years and is stated in depth by studies such as Walkerdine (1989). My analysis concentrated on what exactly were the conditions that promoted equal opportunity in Sally's class. I found the ideas of attribution theory and learned helplessness developed by Carole Dweck [Licht and Dweck (1985)] especially helpful. According to these, Logo tasks by their nature might be expected to contribute to girls' lack of confidence and feelings of inadequacy. However factors were at work within this particular class which counteracted this effect: the open-ended nature of the assignments, the teacher's (and children's) emphasis on process rather than than outcome, the lack of time restraints allowing children to become familiar with the format, the stress on co-operation rather than competition, the fact that the initial evaluator of work was a peer and also that the teacher was keen to be seen as a participant in groupwork rather than a traditional adult authority figure were all seen as significant.

Social Class

Slightly more of the children under study came from a middle class than a working class background. However the cultures that arose in the class did not conform with the patterns of resistance and accommodation that other researchers on both sides of the Atlantic have described. [Pollard (1985), Clarricoates (1987), Davies (1983), Anyon (1983)]. One explanation of this was the large proportion of children whose parents worked in education and had chosen the school for its left-of-centre stance on issues such as gender. The other was that within the groups the children felt themselves to be in control. Resistance and accommodation to the wider cultures of school and society where working class and female pupils are repressed, therefore became less relevant.

Teaching Methods and Groupwork

The most important issue emerging from my research is that successful groupwork is in itself the best way of promoting equal opportunities. Several studies [Galton (1992), Kutnick (1988), Dunne and Bennett (1990)] have looked at how teachers' style and behaviour can best support it and I found elements of these in Sally's practice. In particular she encouraged autonomy by partially relinquishing her role as a figure of authority. She remained a powerful influence with the class, but not in an authoritarian way, monitoring group behaviour and frequently asking children about how it was working. This was done sensitively and children were aware that the onus for making their group work well was on them, not the teacher. This involved her intervening less and showing her own vulnerability. Her paedegogical style also was significant: her goal, infrequently achieved, was guided participation where she became a progressively more equal member of the group. However this did not stop her from responding to requests for didactic teaching or remaining aloof from the group when she felt this necessary.

Conclusions

Groupwork with computers is a very good area of the curriculum to look at gender issues because computers are a symbol not just of technological progress but of power and male power at that; insights gained are therefore of much wider application than just in information technology work.

The nature of Sally's class, its geographical and social context, may have been especially favourable for enhanced equality of opportunity, however I hope my work has shown ways in which teachers can create a classroom culture which is more

liberating for both sexes. By establishing and nurturing collaborative groups within such a culture, teachers can create further subcultures whose size and nature empowers children and enables still further equality of opportunity.

Moreover working together is in itself a good thing for individuals, schools and society in general. By putting collaboration at the top of the agenda, teachers are taking the most radical step in preparing children for a better future. Generally speaking girls' conditioning in primary schools may, as Dale Spender (1983) claims, be preparing them for powerlessness whilst boys prepares them for power; but this is partly a function of the definition of powerfulness. In a world where co-operation is fully valued this is not so. To create a system in which co-operation is given its full value is to turn the world upside down and is essentially liberating for both girls and boys.

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