Promoting Gender Awareness in the Classroom: An Example from Germany

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Abstract

Is there a gender bias in the transmission of knowledge in coeducational institutions of learning and, if so, does coeducational schooling itself act to perpetuate unequal educational experiences for girls in relation to boys? Are teachers themselves aware of the role played by gender in their teaching and, if not, what can be done to remedy the situation? This paper addresses itself to such questions. It points out the cost, both in emotional and cognitive terms, that girls pay for having to accommodate to a male-oriented coeducational system; lower self-esteem, a more passive classroom role and discouragement in developing skills needed for employment in the upper echelons of tomorrow's technological work force. In the paper it will be then discussed a Hamburg project designed to sensitize teachers and educational administrators to gender inequities - "Netzwerk LINT". It address problems of gender awareness in teacher behavior, classroom dynamics, curricular materials and single-sex vs. coeducational settings.

1 Introduction

In educational circles there exists a widespread assumption that the transmission of knowledge is, by and large, free of gender bias and that therefore in coeducational institutions of learning girls and boys receive equal education. In this paper it will be challenged such assumptions as unwarranted, raise questions concerning the possible role coeducational schooling plays in perpetuating gender stereotypes and discuss a German action-oriented research project designed to promote greater gender awareness in the schools. Over the past several years one of the authors has been concerned primarily with this problem of gender equality in coeducational schools: both in terms of her role as a university professor teaching courses in the subject as well by her participation in action-oriented research projects focusing on this problem.

One of the most important insights to emerge out of feminist scholarship is that we live in a gendered world - i.e., gender should be regarded primarily as a social category and not merely a biological one. Seen in this light gender can be construed as a social system for dividing people into different categories regardless of their particular individual characteristics. In our society this system insists on and rewards gender differences: girls want to grow up to be 'real' women' while boys likewise aspire to be 'real men' (Ferree & Hess 1987, p. 16). Gender is also a principle which hierarchically structures our society based on the division of labor by sex.

To have made 'gender' a legitimate category of analysis - in addition to the long established paradigms of 'social class' and 'race or ethnicity'- has indeed been innovative; it has enriched the theoretical concepts in sociology as it has other disciplines. If we do indeed view our world through "a prism of sex" (Sherman & Beck 1979) then this raises the following question: Do teachers also know this? That is to say, are they aware of the role played by gender in their teaching and in their pupils' learning? A major concern of one of the authors, together with several of her colleagues, has been to seek ways in which this insight might be imparted to those actually involved in the education process itself. At present this effort has been focussed primarily at the Gymnasium (i.e. high school) level, but similar gender issues also exist in Germany both at the lower primary school level and at the level of higher education.

This, of course, is not a problem that is restricted to Germany. Thus, a comprehensive summary and synthesis of American studies dealing with this theme was put together by researchers at the Wellesley College Center for Research on Women and published as the so-called AAUW-Report "How Schools Shortchange Girls" (AAUW-Report 1992). When this report was first released on February 12, 1992, the New York Times reported about it on its front page under the heading: "Bias Against Girls is Found Rife in Schools, With Lasting Damage". Other national and regional newspapers also picked up this theme giving the report widespread media prominence. Apparently in the States the revelations about gender differences in schooling were considered newsworthy and of prime concern to the American public.

2 Gender Inequities in Education: Some Disturbing Findings

The disturbing findings of gender differences in education are rather similar in the United States and in Germany. Let us briefly summarize the most important ones.

In Germany, as in the United States, girls generally achieve higher grades than boys throughout their school careers and they also are less likely to repeat a school year. Nevertheless, in higher education, young women pursue a much narrower range of subject-areas, and, as a consequence, in their later occupational lives find fewer options open to them. This, in part, is related to gender differences concerning the pattern of course-taking in the natural sciences. Girls tend to take fewer science courses as electives than boys and those who do are less likely to choose courses at an advanced level (Leistungskurse). Furthermore, even among those who do elect to take a science Leistungskurs there is a difference between girls and boys: girls are more likely to take advanced-level biology courses, whereas boys are more likely to choose advanced courses in physics and chemistry. There are similar gender differences with respect to participation in advanced-level mathematics courses: Female high school students have a lower participation rate even if they show good academic performance in these subject areas. In other words, gender intervenes in the normal relationship between competence in a subject matter, on the one hand, and one's self-confidence in one's ability to master the subject, on the other.

It is true that Several studies have found that girls' academic performance in mathematics and especially in science subjects declines after puberty. Gender-related factors, however, most likely contribute to explaining this phenomenon. For example, adolescence is a period crucial for the development of sex-identity for both boys and girls. Since there continues to be a discrepancy between our cultural image of femininity and high achievement in general, high achievement-orientation in male gendered subjects such as science and math most likely will be felt as inappropriate behavior for young women. Unless there is special encouragement in school from teachers or at home (esp. from mothers engaged in scientific work who can serve as a role model), then female students tend to cope with these contradictory demands either by choosing a more female gendered science subject like biology, or by directing their need for achievement into more socially accepted subject areas, such as languages and literature (Keeves 1985).

In recent years, of course, something new has been added to the traditional concerns regarding the teaching of mathematics and science: namely, the introduction of computer courses within the school curriculum. The ever increasing penetration of computer technology into more and more activities both at home and in the workplace has focused attention on the role of the school in fostering computer education. Since the introduction of micro-computers on a mass scale in the 1980's, the insistence on making

children "computer literate" has been particularly pronounced in the United States. More recently similar demands also have been expressed in Germany, though here these demands have met with more resistance and criticism (Moser 1986; Gergely 1986). Though what is meant by "computer literacy" has changed over time, it has often been associated either with teaching children how to program the computer in a particular language or in familiarizing them with the use of particular types of application programs. The implications such teaching and learning has on gender issues in the schools are the matter of concern. But before discussing the differential impact of computer instruction on gender a brief detour might prove useful.

A number of observers of children's interaction with computers at school have noted striking differences, especially among younger children, in how they relate to computers (Papert 1980; Turkle 1984; Solomon 1986). Some children approach programming with the need to impose their own will onto the machine and to feel they are in firm control. They also appear to experience personal pleasure in the manipulation of formal objects. Such children carefully draw up a preconceived plan of action at an early stage and set their goal as designing a program to realize this plan. They tend to view their program as a means to a personal end - the end of imposing their will on and exerting control over the machine. The final visual result - the graphical, textual or numerical representation of their program on the monitor's screen - is less important to them than the process they forged to get there. The perspective of such children is that of the planner or the engineer and their eventual natural habitat are the fields of science and technology.

Other children, however, display a quite different style of relating to the computer. They tend to develop their programming ideas more impressionistically. Rather than formulating a detailed systematic plan involving formal abstractions they instead pay attention to concrete visual imagery and language; their focus is on such things as feeling, color, sound, and personal rapport. Their programming style is more interactive; i.e., it is only by looking at the screen and contemplating what they already have created that they decide on what to do next. It is the style of an artist: "Try this, wait for a response, try something else, let the overall shape emerge from an interaction with the medium. It is more like a conversation than a monologue" (Turkle 1984, p. 105). They identify with the visual aesthetics of the end-product they created rather than with the means they employed to achieve it. Such children will most likely eventually feel more at home in the arts and humanities.

These different styles have been given various names by those observing children interacting with computers. Papert (1980) calls attention to the contrasting styles of "planners" and "tinkerers." Turkle (1984) elaborates on this by focusing on distinctive styles of mastery; she labels them as "hard" and "soft" styles of mastery. For Turkle programming style is an expression of personality style. In her own words:

> "… the hard masters tend to see the world as something to be brought under control. They place little stock in fate … From the earliest ages most of these children have preferred to operate on the manipulable - on blocks, on Tinkertoys, on mechanisms … It is not surprising that their style of working with the computer emphasizes the imposition of will … The soft masters are more likely to see the world as something they need to accommodate to, something beyond their direct control. In general, these children have played not with model trains and erector sets but with toy soldiers or with dolls … (It is not surprising that their) accommodating style is expressed in their relational attitude toward programming as well as in their relationships with people" (Turkle 1984, pp. 105-106).

Throughout this discussion we have not referred to gender differences but rather to children in general. Nevertheless, it should come as no great surprise that girls overwhelmingly favor the style exhibited by the soft masters, while boys disproportionately adopt the style characterizing the hard masters. There are several reasons why we are not surprised at this matching between gender and styles of mastery. As Turkle has put it:

> "In our culture girls are taught the characteristics of soft mastery - negotiation, compromise, give-and-take - as psychological virtues, while models of male behavior stress decisiveness and the imposition of will … The girl child plays with dolls, imagined not as objects to command but as children to nurture. When the boy unwraps his birthday presents they are most likely to be Tinkertoys, blocks, Erector sets - all of which put him in the role of builder" (Turkle 1984, p. 109).

Thus, gender differentiation can be viewed, in part, as a product of societal norms that designates what types of toys and what forms of correct behavior are appropriate for children of each sex. And this, in turn, can effect the different ways they eventually approach working with a computer. But this difference in how boys and girls work with computers is, according to Turkle, but a microcosm for the larger world of relations between gender and science.

> "Science is usually defined in the terms of the hard masters: it is the place for the abstract, the domain for a clear and distinct separation between subject and object. If we accept this definition, … (then it is a mostly a male domain); but … women, when

> given a chance, can find another way to think and talk about the mastery not simply of machines but of formal systems. And here the computer may have a special role. It provides an entry to formal systems that is more accessible to women. It can be negotiated with, it can be responded to, it can be psychologized … The idea of "formality" in scientific thought implies a separation from the fuzzy, imprecise flow of the rest of reality. But using a formal system creatively, and still more, inventing it, requires it to be interwoven with the scientists most intuitive and metaphorical thinking. In other words, it has to be mastered in a soft form" (Turkle 1984, pp. 118-119).

According to this line of thought the insight with which girls approach science, in general, and computers, in particular, can indeed be legitimate and valuable. But whether or not it is regarded in this light depends to a large degree on how our schools respond. As long as a style of "hard" mastery is the only one that teachers consider appropriate to computer instruction, girls will be discouraged from actively participating. Unfortunately, there are numerous signs that this is the case. For example, computer instruction is often allocated to be taught mainly by teachers of mathematics who, by and large, favor formalisms over the concrete; the overwhelming majority of those giving instruction on computer use are men; and the design of the programming language most favored by schools - Pascal - discourages "soft" styles of "discovery" insisting instead on careful preconceived planning. This is ironic considering that the current emphasis in commercial computer programming is increasingly on the visual, on the aesthetics of multimedia presentation and on the use of object-oriented programming languages. Indeed, one recent book by Brenda Laurel, a person intimately involved with the design of tomorrow's computer interfaces, is entitled "Computers as Theater." In the words of the book's Foreword:

> "… the modern technologies of computation and communication … offer new opportunities for creative, interactive experiences and, in particular, for new forms of drama. But these new opportunities will come to pass only if control of the technology is taken from the technologist and given to those who understand human beings, human interaction, communication, pleasure and pain. It is time for the engineers to go back to engineering. To develop these new technologies, we need a new breed of creative individuals, most likely associated with poetry, writing and theatrical direction" (Laurel 1991, p. IX).

One can merely imagine the impact on the enrollment of girls in computer courses taught by teachers involved with literature, art and drama. Unfortunately, this is rarely the case. Needless to say, as a result of the discouragement in school for girls becoming actively involved in computers or science, there are gender differences in career plans. In the above mentioned

AAUW-Report this is concisely summarized in the following statement: "Girls are systematically discouraged from courses of study essential to their future employability and economic well-being" (AAUW-Report 1992, p. V).

The fact that schools shortchange girls is also reflected in the proportionately higher relative drop among girls than boys in self-esteem between elementary school and high school (AAUW-Report 1992, p. 12, 67). There are several possible explanations of this phenomenon. One explanation is that girls and young women experience a greater amount of stress which, in turn, has a negative impact on their self-esteem. This stress arises out of the conflicting demands they experience between wanting to be liked and popular while at the same time having to demonstrate competence and independence in competition with boys (AAUW-Report 1992, p. 11, 13). An alternative explanation lies in the assumption that there is a relationship between the invisibility of women in curricular materials (the reality of women's work and lives is rarely represented) and in their declining self-esteem. A third possible explanation is seen in the quality of gender relations in schools concerning, on the one hand, the interactions between teachers and students, and, on the other hand, the interactions between male and female students.

There is yet another aspect to this 'hidden curriculum' of interactions in the classroom. No matter what level of education one observes, the inequitable practices are the same: Boys receive more of the teachers' attention than do girls. In Germany it is estimated that boys get about 60% of the teachers' time. This figure is based on available empirical evidence, such as participant observation and videotaping of classroom dynamics. It is not that teachers give preferential treatment to boys on purpose. On the contrary, they are often quite surprised when they are confronted with these findings which go against their educational beliefs in equality of opportunity.

Gender differentiation works in the sense that the same actions are evaluated differently. When boys spontaneously call out answers or questions, they get the teacher's immediate attention. When girls act similarly, however, they are often reprimanded to restrain themselves and to raise their hands for attention. Moreover, when girls do raise their hands in an orderly fashion as they are told, or sit quietly in their seats, they tend to be ignored by their teachers. In other words, there is a gender difference in involvement in the learning process: Boys are given the chance of playing a more active part in the learning process than are girls. Moreover, they consider it their right to do so. For example, when teachers try to distribute their attention in a more equitable manner by purposefully calling on girls as frequently as they do on

boys, the latter tend to complain of unfair treatment (see also AAUW-Report 1992, p. 60, 68).

To compensate for girls' greater invisibility, there would need to be conscious attempts of positive discrimination by actively encouraging girls, in fact, by empowering them. In order for this to happen, the present widespread obliviousness to gender in education has first to be recognized and acknowledged on a much broader scale. For example, the AAUW-Report devoted a whole chapter (AAUW-Report 1992, Ch. 2) to the absence of girls in the current debate on how to restructure education in the States (AAUW-Report 1992, p. 6-9, V). To bring the shortchanging of girls in our coeducational system into the open - that is, to sensitize teachers and educational administrators to this fact - is the main objective of the Hamburg project.

3 Gender Equity Through Coeducation: A Necessary but not Sufficient Condition

In West Germany education at the secondary school level (Gymnasium) initially was segregated by sex. Coeducation at this level, however, evolved on a large-scale as of the mid-1960's and continued to expand into the 1970's. At the primary school level, on the other hand, coeducation previously had already existed for a relatively long period of time. And at the other extreme - the college or university level - coeducation was always the norm since women were first admitted to study in such institutions of higher learning; there never having been any women's colleges like those in the States or in England. Women were, however, only admitted as students into the already existing exclusively male universities at a relatively late date in Germany - just over 85 years ago in 1908. This is in marked contrast to the Anglo-Saxon countries where women have had access to institutions of higher learning of their own for some 150 years. In fact these single-sex Anglo-Saxon women's colleges were pioneers on women's road into higher education.

Given these historical examples of Anglo-Saxon institutions of higher education where sex segregation has indeed been used to advantage rather than becoming a barrier to gender equity, we are certainly in favor of the continued existence of all-female learning environments in addition to coeducational institutions. In this sense we are here not concerned with the controversy whether the relationship between women's colleges and women's higher level of achievement is a genuine or a spurious correlation (Crosby 1991). Nevertheless, it should be pointed out that we are not trying to remove the

"clouds over coeducation" (Arnot 1983) by advocating a reversal of the wheel of history so as to re-establish a sex-segregated secondary school system. The underlying educational philosophy of our endeavors is to reconsider coeducation and not to take its assumed merits of equality of opportunity at face value. Rather our focus is on combining the best of both educational worlds: "We face the exciting but daunting task of creating feminist coeducational institutions" (Miller-Bernal 1991, p. 136).

It should be remembered that in Germany the process of transition from hitherto single-sex secondary schools into coeducational ones occurred during a period conducive to increasing equality of educational opportunity for girls. Although the educational endeavors and campaigns for equality of opportunity which followed the so-called Sputnik shock of the late 1950's concentrated more on class-specific socialization rather than on sex-specific inequality, nevertheless, to some extent these campaigns resulted also in a recognition of the underprivileged educational situation of girls, especially those coming from working class backgrounds. All the empirical studies carried out at the time confirmed that rural Catholic girls with working-class backgrounds had virtually no chance of attending a university. The decade between the mid-1960's and mid-1970's was also a period of great educational expansion in Germany, especially in higher education, which benefited not only working-class children but also young women who now participate in higher education to a greater extent than they had ever done before in German history (currently slightly under 45% of all students are female compared to only about 25% in the early 1960's).

With the transformation of the secondary school system into a coeducational one all the formal barriers to women's equality were removed. That is to say, girls and boys were exposed to the same teachers with the same level of qualifications and they were instructed by the same curricular materials. This was in marked contrast with what had existed previously when the secondary school system was sex-segregated. Then schooling for girls had been 'equal but different' because it was assumed that the education of girls should reflect their future destination as wives, mothers, and homemakers. In this sense the establishment of a coeducational school system was a sign of progress.

Nevertheless, although curricular differences for boys and girls were abolished, coeducation has not led to full gender equality in our schools. In other words, removing formal barriers to female participation may be a necessary but is not by itself a sufficient condition to creating gender-equitable learning environments. As feminist scholars in Germany pointed out, subjecting girls to the same education as their brothers has led to co-instruction rather than

to coeducation in a more literal and broader sense of the term. The price that girls and young women had to pay for having to accommodate to a male-oriented educational system has only recently been perceived as being something to worry about. It is only now starting to dawn on educators that girls' abilities and potentials are not being fully developed and that more particularly those skills needed for a functioning work force, namely strength in science, mathematics and technology were being neglected (AAUW-Report 1992, p. V).

4 An Attempt to Promote Greater Gender Awareness in Hamburgs' Classrooms: Netzwerk LINT

In 1988 one of the authors taught a women's studies course at the University of Hamburg focusing on the extent to which schools encouraged or discouraged girls' interest in science and technology. Before starting to read and work through the relevant research literature each participant talked about their own respective experiences at school and at home. It could be said that the learning strategy of "connected knowing" was used (i.e. the subject area that was studied has been approached through a personal-biographical route) though at the time we were unfamiliar with the book by Belenky and her associates on "Women's Ways of Knowing" (Belenky, Clinchy, Goldberger & Tarule 1986).

Every year in mid-November the University of Hamburg opens its doors to the public by having faculty present some of their teaching or research projects to a wider lay audience. This opportunity was used to present our seminar - its learning approach as well as the evidence of the research - during the "Universitätstage 1988". There were quite a few female high school students, teachers, parents, and other educators who attended our presentation. These participants wanted to have bibliographical references of the literature we had used as well as other information on schools, girls, science, and technology. Given these requests we compiled a small brochure which since has been reprinted three times and which is now out of print (Colloquium zu Fragen der Frauenforschung am IZHD der Universität Hamburg 1988).

Out of these activities evolved our "Netzwerk LINT" (Lehrende in Informatik, Naturwissenschaften und Technik) which is a German abbreviation for a network of teachers and educators in the fields of computer science, natural sciences, and technology. When first started in March 1989 some initial funding was obtained from the Education Department of the City of Hamburg (Behörde für Wissenschaft und Forschung) for the purpose of making the Network's existence known to a wider audience. Later in January 1992 a

substantial grant from the German Federal Ministry of Education and Science (Bundesministerium für Bildung und Wissenschaft) was obtained for the purpose of carrying out a broad scale action-oriented research project designed to sensitize teachers and educators to the existence of a gender bias in schools (Sommerkorn & Liebsch 1994).

Although the original purpose of the Network was to discuss and reflect upon the problems of transmitting scientific and technical knowledge to girls, it has since broadened its perspective to include other subject areas. LINZ is forum of predominantly female educators who work in a variety of different educational settings: e.g., practicing school teachers, would-be teachers, women involved in vocational and adult education, educational administrators, educational researchers, and a few mothers heavily involved in PTA-activities. Attendance is voluntary with no one being paid a stipend or charged a fee for participation in the meetings which are held every three to four weeks during the school year. Protocols are taken during the meetings and these minutes, along with an invitation to attend the next scheduled meeting, are sent out not only to the participants but also to other interested parties on our mailing list.

The intrinsic motivation to fill one's already busy schedule with yet another meeting is due to the fact that the Network provides a forum where several needs of educational practitioners are being met.

1. The Network is a forum for the exchange of ideas and work-related personal experiences concerning gender relations. Such topics as teacher behavior, problems arising out of challenges to the authority of females teaching gender-inappropriate subjects, classroom dynamics and curricular materials are addressed. The focus of such discussions primarily centers on what effect such factors have on learning and self-esteem not only among girls but boys as well. LINT also strives to gather information about small projects and experiments concerning teaching and learning in single-sex vs. coeducational settings.
2. The Network is also a forum where one can learn about and discuss recent literature and research relating to this field. As such it meets the need to transmit summaries of new research findings on gender-related studies to teachers who in their busy daily routine would not find the time to do so on their own.
3. The Network also provides a "helping hand" to those teachers who are already sensitized to the gender issue and who, as a consequence, plan to carry out gender-related projects in their own schools. Being able to provide such teachers with new ideas and curricular materials is of immediate benefit to the participants. It also helps promote gender awareness among others in

their own school.

4. In the Network meetings we have also dealt with the topic of how to address the problem of gender equity at PTA-meetings. Equality issues are not merely academic ones but involve challenges at a personal level and can thus meet with emotional resistance. Up to now, gender bias has been discussed mostly under the heading of "how schools shortchange girls," - as the title of the AAUW-Report suggests. At PTA-meetings, however, we are confronted not only with the parents of girls but equally with those having boys at school. And their gut reaction is: if girls are shortchanged in math and science, so are boys in languages and literature. Whether parents believe that gender matters in education depends on what hopes and images they have for the future adult lives of their daughters and of their sons; images that, in turn, touch upon their ideals of womanhood and of manhood, a sometimes touchy issue. A group of Network participants developed a small brochure as guidelines on how to deal with the problem of gender and equity at PTA-meetings (Jansen-Schulz, Müller-Balhorn, Müllerwiebus & Nellen 1992).

5. Last, but not least, the Network also fulfills a 'clearing house' function in the sense that the participants inform each other about all relevant activities and meetings, lectures, etc., going on both in the local Hamburg scene as well as at the national level.

To recap, the Network is an educators' forum in the sense that it provides the participants with the opportunity to better understand the mechanisms of gender relations in education and thus help them to gain more insight into their own work. It is interesting to note in passing that some American writers have made the point that in the States there are not enough forums such as our Network "in which teachers carry on in-depth conversations over long periods of time". This is because of the widely held belief, even among teachers themselves, that teachers' practical knowledge could not "contribute to the formation of educational theory or the solution of practical problems" (Evans, Stubbs, Frechette, Neely & Warner 1987, p. 4).

5 Summary and Conclusion

This article began by raising the question as to whether or not there exists a gender bias in the transmission of knowledge even in coeducational institutions of learning. If so, this leads to several further questions. Is it possible that coeducational schooling in itself plays a role in perpetuating gender stereotypes that result in unequal educational experiences for girls in relation to boys? If

this proves to be the case, are teachers aware of the role played by gender in their teaching and in their pupils' learning? And if teachers are unaware of gender issues that do exist in the classroom what can be done to remedy the situation?

It is true that with the transformation of the secondary school system into a coeducational one all the formal barriers to women's equality were removed. That is to say, girls and boys were exposed to the same teachers with the same level of qualifications and they were instructed by the same curricular materials. Girls and young women, however, have had to pay a price, both in emotional and cognitive terms, for having to accommodate to a male-oriented educational system and as a result their abilities and potentials are not being fully developed. Thus, a greater decline among girls than boys in self-esteem during the years between elementary school and high school was noted. This, in part, may be accounted for by the style of interaction between teachers and pupils in coeducational educational institutions: a style that serves to encourage the active participation in the classroom of boys while at the same time relegating girls to a more passive role. An unanticipated consequence of coeducational education under these circumstances is that girls are shortchanged in their educational experiences. For example, they are discouraged in various ways from taking as electives advanced courses in the natural sciences and mathematics - courses that lay the basis for the development of skills that will be needed in the upper echelons of tomorrow's work force. The style favored by those teaching computer programming in the schools also tends to discourage female participation. Thus, the level of their future employability and their long-term economic well-being is being effected. In brief, coeducation has not led to full gender equality in our schools.

A Hamburg project designed to sensitize teachers and educational administrators to gender inequities - "Netzwerk LINT" was then discussed. It's original purpose was to promote greater gender awareness among teachers and educators in the fields of computer science, natural sciences, and technology. Since then, however, the Network has broadened its basis to include educators and interested parties working in a wide variety of different educational settings. It now serves as a forum for the exchange of recent literature and research, small projects and experiments, ideas and work-related personal experiences concerning gender relations. It transmits information on gender-related themes that affect learning and self-esteem not only among girls but boys as well. It addresses such topics as teacher behavior, problems arising out of challenges to the authority of females teaching gender-inappropriate subjects, classroom dynamics, curricular materials and teaching and learning

in single-sex vs. coeducational settings. In addition it is able to provide teachers already sensitized to the issue of gender with new ideas and curricular materials to carry out gender-related projects and to promote gender awareness among others in their own schools.

The Network also discusses how parents and families can be involved in the process of promoting greater gender equity. Since equality issues are not merely academic ones but involve challenges at a personal level as well - touching on one's idealized images of womanhood and of manhood - we can expect to meet with emotional resistance on the part of some parents, especially among those with boys at school. Although they might agree that girls are shortchanged in math and science they often believe that this is more than compensated by the fact that their own sons are similarly disadvantaged in other subject areas.

Promoting gender awareness in the classroom requires consciousness-raising at different institutional levels as well as amongst different groups of educators. As can be seen from the occupational composition of our Network's participants, it is located at an institutional cross-road between school, college and adult education. Within the institution of the school, gender awareness needs to be promoted amongst a variety of different groups: the pupils themselves within the classroom, the teachers, the school administrators, the parents, the school board and educational policy makers and last but not least among student-teachers.

How can greater gender awareness be brought about? Making educators become less oblivious to gender relations in teaching and learning cannot simply be ordered or imposed from above by legislation or by requiring the use of new instructional materials. Although the curriculum is considered to be "the central message-giving instrument of the school" (AAUW-Report 1992, p. 67), it should not be forgotten that curricular materials have to be administered by real people whose biographies have already influenced their own more or less developed consciousness about gender relations. Emphasis must be placed on sensitizing people in the education system to the gender issue and on the fact that it is a long and often painful process requiring not only the learning of new perspectives but also the unlearning of old ones. Since gender is a vital part of our identity, rethinking our views about gender and equity may require deep-rooted socio-psychological changes that may be perceived as threatening. Since few individuals like to be confronted with their own sexism it is not surprising to encounter emotional resistance.

To our mind there are three related but distinct phases in this learning process of gender awareness. First, one has to recognize what is going on in the

classroom. And second, one has to acknowledge what one has observed or what the research literature tells us. Needless to say, these two steps are interconnected and at times the second may be a prerequisite for the first. As one teacher told us: "I wouldn't have seen it, had I not believed it". If one's mind remains in a constant state of denial ("It can't be true because I don't want it to be true"), then the third step is not possible; namely, trying to do something about gender inequity. In German these three steps of cognitive and emotional awareness are called: wahrnehmen - wahrhaben - wahrmachen. In other words, there are cognitive as well as emotional dimensions to learning about sexism.

As mentioned earlier, our activities in Hamburg started when we became aware of the glaring gender gap in math, science and technology. While the gender gap is still strongest in these traditional male dominated subject areas of science and technology, the gendering of life can be seen also in other subjects in our coeducational schools. Originally the focus of attention to overcome gender inequality in educational and occupational attainment was to empower girls rather than to change boys. As has often been the case in the history of the emancipation of women the issue of equal opportunity was viewed as a "female rather than as a male problem" (Miller-Bernal 1991).

There are many historical instances where the burden of having to make compensatory efforts is put exclusively onto women's shoulders. One of the most striking examples is the widespread view that the compatibility of work and family life is "the woman's social dilemma" rather than perceiving it for what it is, namely as a societal problem (Sommerkorn 1988, p. 130). Given the fact that boys and men are also part of the gendered world we live in, we should now begin focusing on compensatory efforts needed to be made also by males. If girls are to be encouraged to develop their scientific and technological abilities, then boys certainly should be educated to display a greater family commitment. While sounding simple, it is not easily achievable because of the intricate connections with our deeply rooted cultural prescriptions of what constitutes a proper masculine sex-role identity. Nevertheless, in Germany the pendulum has recently started to swing in this direction. That is to say, policy discussions concerning the compatibility of family and work increasingly emphasize the fact that this is a problem for men as well as women: a problem requiring changes in basic social norms and institutions, including the school (Sommerkorn 1995).

As previously pointed out, it is claimed in educational research and policy that the curriculum is an important instrument in structuring students' experiences. Moreover, it is claimed that a curriculum which brings modern

social reality - a reality that both reflects the students' own experiences as well as their future roles in adult life - into the classroom is an essential feature of a good gender-equitable learning environment. If these assumptions are correct, then changes in the curriculum constitute another important dimension of promoting gender awareness in the classroom.

Let us conclude by giving you one example of what, to our mind, definitely needs to be included in a reformed formal and informal curriculum. Amongst the important social changes that have taken place since World War II in American and German society - as well as in a number of other European societies - are changes both in gender roles and in the overall status of women. The influx of married women, even those with young children, into the labor force has been called a "Subtle Revolution" (Smith 1979). The husband/father as the breadwinner or good economic provider in the so-called "two-person single career" family (Papanek 1973) has become obsolete as the dominant family form. The dual-earner family has become the statistical and social norm.

Since women's place is no longer only in the home, the problems of combining both family and work roles become an increasing challenge for society as a whole. That is to say, today it is as much men's social dilemma as it is a 'women's dilemma'. The social challenges caused by this 'subtle revolution' and the resulting changes in the status of women call for actions and reforms in all the central institutions of society which promote gender awareness, and most particularly in our educational institutions. Fundamental changes must be made in our sex-segregated worlds of family and work in order to ensure that society's family objectives - taking care of children and the elderly - are not 'solved' by sacrificing gender equity (Bailyn 1990). Given the central role of our schools as mandatory socialization agencies during one's formative years, promoting gender awareness in the classroom is an important way to start!

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