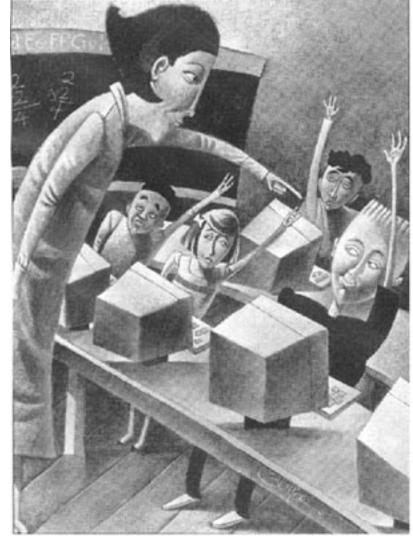# Equity in Computer Classrooms

by Ray Ostrander

P_rejudice. Inequality._ Abhorrent words. None of us would to admit to such views. Yet a look at instructional attitudes about computers and related technologies often reveals stereotypes and prejudices. While not intentional, such attitudes are often societally programmed by parents, friends, public officials, the media, language, and church. In this article, we will explore briefly the basis for these attitudes and suggest some things that teachers can do to foster a more equitable climate for computer instruction.

Generally, girls and students of color are alienated and excluded from computers and related technology for a number of social, psychological, attitudinal, and environmental reasons. These groups generally have been socialized to identify computer technology and technically literate individuals as belonging to a white, male, hacker culture. Feelings of technological incompetence and alienation either begin or are reinforced in school. Computers and other high-tech equipment are generally seen as somewhat related to math and computer science, still predominantly white male domains. Teachers and peers rarely encourage girls or students of color to aspire to higher levels in these disciplines. It is as if a _No Girls (or Minorities) Allowed_ sign has been hung on computers.(1)

Likewise, teachers' instructional feedback often makes girls and minorities feel technologically incompetent. According to research compiled by Grossman and Grossman, teachers "demonstrate a clear bias in favor of male participation in their classes"(2) because they "view high achievement as a masculine characteristic and low achievement as feminine."(3) Similarly, teachers give boys of every ethnicity more attention than girls--they call on them more frequently to prevent behavioral problems and give them more positive feedback. Conversely, girls are praised for quiet, non-assertive attitudes as well as "neatness, following instructions exactly, and raising their hands".(4) In giving instruction, teachers will physically assist girls and minorities with the actual task at a computer station, while expecting boys to complete the task with only verbal assistance.(5) Therefore, as a reward for obeying the rules and waiting to be called upon, girls are often ignored and, therefore, miss valuable interaction and learning experiences with computers.

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Unequal Feedback

Grossman and Grossman's research(6) also indicated that teachers were more likely to give boys praise, criticism, and clear feedback. Let's listen in on verbal instructions being given to boys in a high school computer course: *Check. Where is your cursor ? Did you find the run command? That function isn't right; back track your thinking and do it again.* (7) These kinds of comments help boys improve their computer skills. Unfortunately, teachers tend to make neutral comments to girls(8) as demonstrated by the following verbal interactions with girls, overheard in the same computer class: *Uh-huh. Okay. That page layout is nice. Let me answer Harold's question, and then I'll be right back.*(9) As a result, girls get far less critical, essential information about how they are doing, and few specific verbal clues on how to succeed.

Software selection is another contributing factor to instructional bias. Many educational software games introduce children to basic computer technology. Because these games allow users to interact with and explore computer capabilities, students who play them gain an advantage. Currently, far more boys than girls play computer games. (10) Koch stated, "Many researchers argue that this is due to the types of games on the market; the software appeals to boys rather than girls. Boys are more attracted to products that depict violence, emphasize competition," have strict rules, demand that players achieve supremacy to be successful, and require strong hand/eye coordination.(11) Also, most arcade-type games perpetuate stereotypical masculine and feminine roles, i.e., male figures being dominant and aggressive, while females are passive and submissive, objects

to be conquered.(12)

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According to Heidi Danglemaier,(13) a computer game designer in New York, boys tend to choose violent, supremacy types of games 70 percent of the time, while girls choose them only 30 percent. In general, Danglemaier noted, girls prefer purposeful games with practical, real-life problem solving, strong female central characters, personal interaction, and a sense of closure. According to Koch and Shieves, most girls find video games a waste of time.(14)

Societal Myths

Societal myths also contribute to inequities in technology instruction. Following are a few of such myths:

1. Only white-collar professionals use computers; women are too pretty and qualitative to appreciate the quantitative nature of computer technology;
2. People of color don't have the background or need to use computers;
3. There is a biological basis for males' technological abilities;
4. Students learn better from teachers of the same sex and color (the assumption being that most, if not all, computer instructors are male Caucasians).

Many people believe these myths, and society thereby reinforces them. For instance, computer hardware advertising usually depicts men as users and women as clerical workers or sex objects.(15) One survey found 59 percent of computer advertising presented a lone male, 90 percent of whom were white.(16) Most of the homes that have computers are Eurocentric, and in these homes, males are more likely to be the users.(17) Significantly more boys than girls enroll in summer computer camps.(18) At computer stores and trade fairs, one sees far more white males than females as store personnel, vendors, and customers.(19)

Computers and related technologies have generated many career opportunities, so females and minorities need opportunities to learn and use the technology for more than just basic skills instruction. As world economies become more computerized, people without computer skills will be at an ever-greater disadvantage. If children avoid computers because of negative attitudes, they will have trouble overcoming these attitudes as adults.

Overcoming Negative Attitudes

So what can we do? Teachers are important influences in students' lives. Next to parents, they are the ones most likely to encourage children to choose careers in math, science, and technology.[20] Werner[21] found that students who have overcome what research calls *devastated backgrounds* had at least one thing in common--an adult outside of the family who cares about them. More often than not, that adult is a teacher. Likewise, the classroom environment makes a difference if it is positive and supportive, offers diverse role models, and uses text and illustrations that feature women and people of color using computers.

Furthermore, classrooms must be equitable. In an equitable environment--

- All students, of whatever race or gender, shy, assertive, quiet or loud, are encouraged to speak and ask questions about computer use.
- All students have equal, scheduled access to computers both during class and outside of class.
- The contributions of female and male computer technologists from diverse cultural backgrounds are included in the curriculum.
- Stereotypes about computer users and non-users are directly confronted.
- Computer activities are designed to match the interests of all students.
- The computer's usefulness in areas other than entertainment/games is stressed.
- Dependent and helpless behavior is discouraged.
- Teachers analyze the reasons for students' negative attitudes and non-use of computers, and take steps to overcome these problems.
- The same kind and amount of help is provided to all students.
- All students experience leadership roles.
- Praise is based on achievement, not neatness or docility.
- No one is allowed to put down, pick on, or bully other students.
- Teachers praise both boys and girls about personal appearance or avoid remarking about personal appearance altogether.
- The class is under the teacher's direction. No one student is allowed to dominate in the classroom or on the playground.

Ray Ostrander is an Associate Professor of Teaching and Learning at Andrews University, Berrien Springs, Michigan, where he teaches Computer-Assisted Instruction, Language Arts Methods, and Process Writing Methods. Recently, he received funding from the National Science Foundation to research equity issues as they relate to classroom computer use.

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