

WOMAN, WIFE, MOMMY, AND SCIENTIST: THE IMPACT OF A READERS' THEATRE PLAY ON ELEMENTARY PRE-SERVICE TEACHERS' UNDERSTANDING OF GENDER ISSUES

J. MATKINS, R. MILES, and J. McDONNOUGH
University of Virginia, Charlottesville, Virginia

A century ago, few women worked in a science-dominated occupation. Today, females work in all areas of science. Despite an increase in the number of women in the sciences, they still face difficulties when it comes to accessing math and science occupations. Gender stereotypes continue to exist. Young ladies still select jobs that are familiar to them, jobs associated with female role models. It was reported by the American Institutes for Research in 1998 that 90% of the women at a job fair flocked to the business aide (i.e., secretarial and administrative assistants) and health care professions that are primarily associated with females [1]. These same professions offer lower salaries, less prestige, and little autonomy, yet women continue to choose them.

Improvements have been seen in math and science course-taking patterns. Since 1990, the difference between the number of girls and boys enrolled in math and science courses has decreased. Even though more girls are now taking physics classes in high school, a lower percentage of girls are majoring in physics in college [1]. Because such discontinuities still exist in gender profiles, it is important to continue to recognize and challenge gender stereotypes as we question patterns of continuing inequity between boys' and girls' career choices.

Readers' Theatre

Readers' theatre is a unique form of presenting human situations in a dramatic format. It is an informal, innovative, and structured method that allows participants to assume and to experience the roles of others. There is no need for scheduling rehearsals or practices, memorizing parts or lines, painting or managing props, or acquiring scenery or costumes; readers' theatre may be performed within the confines of a traditional classroom setting. The key to readers' theatre is utilizing a script that allows a reader, or group of readers, to read passages aloud from the chosen dramatic text, thus capturing the interest of the audience. Student readers themselves become engaged in the drama, play an active part in the implementation, and can be involved in the evaluation of the exercise.

As a dramatic tool, readers' theatre involves students in a variety of learning experiences, tapping them at physical, emotional, verbal, and intellectual levels [2]. Furthermore, readers' theatre attempts to increase students' sensitivity to the difficult emotional situations of others and, therefore, encourage tolerance [3]. At various levels, readers' theatre illustrates a point by creatively setting a mood to teach concepts and having children gather information through group interaction. More importantly, this form of drama can elicit empathy by expressing attitudes and concerns through various characters. The participants in a readers' theatre presentation can examine multiple perspectives by analyzing characters and developing interplay between personal and empathetic feelings [3.5]. Finally, this kind of activity can allow students to verbalize problems, while at the same time maintaining a distance from their own insecurities [4]. Student participants can question, react to, discuss, and reflect on issues that they might otherwise be hesitant to address [3]. In this way, readers' theatre can alleviate fear of embarrassment over certain social or personal conditions by giving the student a "voice," other than his or her own, through which to act out the focus of their own concerns. They can act freely, without any fear of personal cross-examination by peers. In a sense, the student is able to examine the situations created by the dramatic text by using a character's voice, yet still vocalize his or her own internal concerns.

A Project Using Readers' Theatre to Address Issues of Sexism in Science

Readers' theatre was used in our project, "Woman, Wife, Mommy and Scientist: The Impact of a Readers' Theatre Play on Elementary Pre-Service Teachers' Understanding of Gender Issues." The information in the play was the result of a two-year long qualitative research project. A major emphasis of qualitative research involves the development of a highly detailed description of subjects that includes direct quotations capturing personal perspectives and real-world experiences. Also, the researcher's personal experiences and empathetic insights are an important and critical part of qualitative inquiry [6], much the same as the relationship assumed between the readers and the characters in readers' theatre.

The play discussed in this paper is a readers' theatre production in which the characters are actual female scientists who participated in a research study coordinated by the University of Virginia in 1994-96. The script communicates the results of the research through the words of the participants of the study. The readers who read the script, volunteers from a group of elementary pre-service teachers, represented women who revealed how they became established, credible scientists. Just as the women scientists' stories presented a developing paradigm shift in the roles of women in the culture of science, the young teachers-to-be who read the words of the *women scientists* also experienced that shift, and reflected upon their own situation.

The day the script was read, students came to class without any prior notice that they would be performing a play together. At the beginning of class, the instructor asked for volunteers to portray each of the six women. Those who volunteered were given scripts with their parts highlighted, and place cards designating their role to set in front of them. The readers were told to follow along in their scripts, and to try to come in promptly when it was time to read their part. They were also instructed to "read loudly and clearly, and don't hesitate to put feeling or emotion into the part you're reading." The instructor played the part of the researcher while the rest of the students in the class listened. Following the performance, there was a question and answer period in each of the three classes. Just prior to dismissal, students were instructed to fill in the questionnaire as a homework assignment.

Since the readers' theatre presentation was the primary instruction provided on gender issues, it can be concluded that questionnaire and survey results related to this topic reflected the impact of the readers' theatre play. Student groups at three sites, the University of Virginia in Charlottesville, Salisbury State University in Maryland, and St. Norbert College in Wisconsin, read through the script and responded to the questionnaire. The students were all in elementary science methods courses at their institutions. There were 68 students in the three classes and, of the 68, 61 were female.

The University of Virginia pre-service elementary science education class is a component of the approved elementary education program, as are the classes at Salisbury State University and St. Norbert College. Approximately eight of the students at UVA were in the Post Graduate Master's of Teaching (PGMT) elementary education program, a program for persons who already have a bachelor's degree in a subject area. Students at UVA were either fourth-year or PGMT, whereas students at Salisbury State were juniors. Students at St. Norbert were sophomores or juniors. St. Norbert and Salisbury State have four-year programs in elementary education.

Results

In addition to the questionnaire completed after the performance, a survey was administered to the classes early and late in the semester that included items about gender issues and education. Survey data were collected using an adaptation of the Attitudes Toward Computer Technologies (ACT) and Self-Efficacy for Computer Technologies (SCT) instruments developed by Delcourt and Kinzie [7]. Data were collected on attitudes toward educational technologies and science education issues, as well as on perceived self-efficacy with these same categories. Three issues were addressed in the survey that clustered around diversity and inclusion in science

education: gender issues, special needs issues, and multicultural issues. Pre-test results showed pre-service teachers gave the lowest rating in their acceptance of the usefulness of knowledge of gender issues, compared to multicultural and special-needs issues. Gains were seen in the post-test in acceptance of the importance of knowledge on the three topics with the greatest increase in gender issues, with 68% feeling strongly on the pre-test and 87% feeling strongly on the post-test.

Pre-test to post-test change in agreement about the importance of knowledge of . . . on a day-to-day basis (N = 68-70)

"Strongly Disagree" responses to the query, "I don't have any use for knowledge of . . . issues on a day-to-day basis."

	Pre-test	Post-test	Change
Gender Issues	68%	87%	+19
Multicultural Issues	83%	88%	+5
Special Needs Issues	85%	91%	+6

The self-efficacy measure (I feel confident with my understanding of . . .) showed a similar low-level of confidence for all three issues on the pre-test. Post-test results showed gains in self-confidence in all three categories.

Pre-test to post-test change in self-efficacy (N = 64 to 68)

"Strongly Agree" responses to the query, "I feel confident with my understanding of . . . issues related to elementary science education."

	Pre-test	Post-test	Change
Gender Issues	21%	69%	+48
Multicultural Issues	21%	73%	+52
Special Needs Issues	15%	55%	+40

Students also contributed data on the impact of the readers' theatre play in their answers on the questionnaire administered immediately following the performance. Responses to the questionnaire were coded to protect the identity of the respondents. The questionnaires contained four questions related to the impact of the readers' theatre presentation and also solicited short responses from the students.

Pre-service elementary teachers in the science methods courses at the three institutions reported that the readers' theatre script was much more interesting than reading a research paper, and that it kept their attention. Several members of the classes reported that, because of the readers' theatre format, there was a sense of a real person and not just a person in a textbook. In response to a question about the impact of the information in the readers' theatre script upon their teaching, students said they would teach that science can be compatible with having a family. They also said that, as teachers, they would encourage all students, especially females, to reach their goals and follow their dreams. The pre-service elementary teachers resolved to introduce positive role models, like the scientists in the readers' theatre script, to their female students. At the same time, however, the exercise reminded them that there still are gender biases. As future teachers, the students reported that they would strive to overcome gender bias in their classrooms. A male student in the UVa class stated:

“When I teach, I will make sure that females are given the same opportunity as males to work with hands-on activities.”

“I think that I'll be more aware during group time in encouraging all students to take part in all activities.”

Analysis

The results of this project showed that the readers' theatre approach was effective in informing an audience about the lives of women scientists. It engaged the students of these pre-service elementary science methods classes in an active portrayal of the lives of six women and, in doing so, enabled the students to identify with these women scientists. The survey results showed the potential for readers' theatre productions to effect change in attitudes about issues such as sexism in society. The relatively low percentage of students who felt strongly about the importance of understanding gender issues at the beginning of the semester contrasts greatly with the end-of-semester results. Many students changed their attitude about the day-to-day importance of knowledge about gender issues. Also, prior to the readers' theatre play, responses to the survey questions on the three issues questions—gender, multicultural, and special-needs—show a difference among attitudes toward the three. Many more students considered knowledge of special-needs and multicultural issues to be more important than they considered knowledge of gender issues. Survey results at the end of the semester show that gender issues were considered similarly important to the other issues. The self-efficacy question results show a low level of confidence in understanding all three issues, and there is a large increase in confidence in all three at the close of the semester.

Questionnaire results reflect the aspects of engagement and empathy indicated in literature on the usefulness of readers' theatre. Student responses indicated an increased awareness of the dilemma posed between the demands of traditional female roles and the demands of science careers.

Since the readers' theatre performance was the primary avenue for addressing gender issues, it is reasonable to infer that the performance and subsequent question and answer session contributed to the changes seen in the survey responses, and to the changes reported on the questionnaire. Readers' theatre provides a venue for maintenance of emotional distance so the audience may address a complex array of issues and develop ideas about how they, members of the audience, reconcile their personal feelings with their empathy for the characters.

Changes in stereotypical attitudes and behaviors are not easy. The very benefit of stereotypical behavior is an assurance of social acceptance and belonging, and a relaxation of behavioral oversight of one's self. Sexism is one of the "big three" stereotypes, along with racism and ageism, and is extremely difficult to alter [8]. However, student responses following participation in this readers' theatre show a change in attitude and in confidence in understanding the issue of sexism in the field of science.

To say that the results of this project show that change will be reflected in the classrooms of these pre-service teachers is optimistic, but possible. If larger purposes and directions, such as rebutting sexism in science, are to be infused into the stress of day-to-day tasks of teaching elementary and middle school, then pre-service teachers require exposure to the issues in a manner that is non-threatening, engaging, and creative. In addition, the stories of these particular women show that certain cultural stereotypes that have restricted women—those involving duty, responsibility, and fulfillment as a wife and a mother—can be reconciled with the role of scientist. In many ways, readers' theatre builds a bridge of understanding for issues that may threaten an audience, while at the same time the women's stories create yet another bridge between the traditional roles of women as wives and mothers and the, as yet, untraditional roles of female scientists. ■

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INTERVIEW WITH JUANITA JO MATKINS

Q: What career path did you follow to reach your present position? Is this what you originally aimed for, or were there twists that brought you here?

A: Considering that my ambition in undergrad school was to become a professional actress and director, I would say that there were definitely some twists and turns along my path! I have always been something of a crusader, though, and resolute in my determination to work towards a better world. That is consistent with the choices I made along the way that led me to become an elementary teacher. Once I saw teaching as a vehicle for making a difference in a kid's life, and for helping effect positive change, teaching was the way for me. I went back to school in 1976 and obtained my elementary teaching license along with my Master's degree in elementary education. I taught in Louisa County for almost twenty years, mostly in the elementary grades. While teaching elementary school, I was invited to become the science resource teacher for a new school that was equipped with a science lab. What great fun that was, teaming with classroom teachers and working with all the children at Jouett Elementary School, in Louisa, Virginia! The ability and the eagerness of those children to learn science belied my own elementary school experiences, and I began to question the sexist, racist, and economical/elitist attitudes of my own culture towards children's abilities to learn science. From this, I determined to move beyond K-12 education and work at the college level, training elementary teachers and doing research to make science more accessible to all.

Q: Have you been involved in similar programs before? Was there a particular moment or stimulus that caused you to begin this project?

A: I'd never written a readers' theatre script before I began this project. Looking back on my theatre experience as a (much) younger woman, though, it was a natural outgrowth of that training and my frustration with the way traditional research seemed to "miss the point" in communicating the heart and soul of these women scientists I had studied. If there was one moment or point when I began, it was probably after the second presentation I did on the women scientists' research, when I realized how frustrating it was to me that the audience seemed distanced from the information provided. I wanted to bring the audience emotionally closer to the realities of women struggling as scientists while finding their place as wives and mothers.

Q: Have there been any unique or unexpected consequences for you resulting from your project?

A: I was surprised at the very positive reception of presentations of the readers' theatre script at two conferences where the organizations had a reputation for scientific objectivity: the National Association for Research in Science Teaching and the American Meteorological Society. After both readings, women and men came up to me to talk about their personal experiences with the same phenomena revealed in the readers' theatre stories. It became clear to me that there was a universality to these women's stories.

Q: Are you able to identify the greatest lesson you have learned and the rewards you have gained through working on “Woman, Wife, Mommy, and Scientist?” What is the greatest benefit you see coming to students—and teachers—through their engagement with this project?

A: There is a perception in the culture, reflected in the questions from the audience following the presentation of the script, that sexism no longer exists in our society. Nonetheless, my own students at UVA shared stories of sexist practices in their own families that show that this issue has not gone away. The greatest reward I get from this project is when I see renewed resolve in the eyes of a woman or man as the stories of these six women scientists are examined. I don't suppose that one reading of a script will change entrenched attitudes toward women, but I believe that this script has an emotional impact that lingers. I do hope that those who come to the play with sexist attitudes will be uncomfortable with those same attitudes when they leave.