

The Teachers' File

EDUCATION FOR THE HEART AND MIND: FEMINIST PEDAGOGY AND THE RELIGION AND SCIENCE CURRICULUM

by Joyce Nyhof-Young

Abstract. Feminist educators and theorists are stretching the boundaries of what it means to do religion and science. They are also expanding the theoretical and practical frameworks through which we might present curricula in those fields. In this paper, I reflect on the implications of feminist pedagogies for the interdisciplinary field of religion and science. I begin with a brief discussion of feminist approaches to education and the nature of the feminist classroom as a setting for action. Next, I present some theoretical and practical issues to consider when developing a feminist praxis and an antisexist curriculum. This leads into a discussion of the role of language and critical reflection in the religion and science classroom, the risks associated with reflective discourse, and considerations in the use of “feminist” teaching tools such as small group work, journals, and portfolio assessment. I conclude with a reflection on how feminist pedagogy promotes an epistemology that speaks to the hearts and minds of participants in the dialogue of religion and science.

Keywords: antisexist curriculum; classroom discourse; critical reflection; curriculum development; education; epistemology; feminist pedagogy; feminist praxis; journals; language; personal theory building; portfolios; religion; science; small group work.

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Feminist educators and theorists are stretching the boundaries of what it means to do religion and science (Code 1991; Fox Keller 1992; Harding 1986; 1991; 1993). They also are expanding the theoretical and practical frameworks through which we might present curricula in those fields (Noddings 1993).

Feminist educators argue that feminine values such as caring, cooperation, consensus, intuition, and personal knowledge are systematically repudiated in the masculine rationality promoted by the educational system (Belenky, Clinchy, Goldberger, and Tarule 1986; Noddings 1984; 1992; Goodman 1992). As a result, students (even those in science) tend not to be knowledgeable about science and scientific activity, hold deficient or distorted views of science and technology as value-free, impersonal, and masculine endeavors, and see scientists as lacking in social responsibility (Kahle and Rennie 1993; Kelly 1988; Measor 1983). To counteract such concerns, feminist pedagogies promote community and equality and aim to generate a trusting teaching and learning environment in which all participants are valued and can learn to participate equally (Schriedewind 1987). These priorities are seen as arising from the lived experiences of women.

Power dynamics, both inside and outside the classroom, often make the equitable dialogue promoted by feminists difficult to maintain. In my own case as a science educator, for example, I have often noted an appreciable difference between my espoused views as a teacher and the changes I am able or willing to implement in my classroom. This is not unusual and suggests that a critical perspective is necessary for educators (Luke and Gore 1992).

A central objective of a critical feminist pedagogy is to encourage us as educators to develop our ability to analyze and assess critically the social structure of education, locate ourselves within it, and act accordingly (Briskin and Coulter 1992). This implies that we need to develop an explicit awareness of power relationships within the science and religion classroom and of the personal positionings and compromises that are part of our teaching and learning contexts. For example, as educators we have a major influence on how the curriculum is presented in the religion and science classroom. We develop and adapt curricula to fit our knowledge, priorities, and unique teaching contexts (Clark and Elmore 1981; Connelly and Clandinin 1988) and strongly influence how a curriculum is taught by determining which topics and activities are appropriate for our students (Brophy and Good 1974). As a result, our behaviors, beliefs, and attitudes, our preparation in science and religion, and the support we receive to promote and teach our courses have an important influence on student outcomes (Kahle and Rennie 1993; Nash, Allsop, and Woolnough 1984).

In what follows, I reflect on the implications of feminist pedagogies for educators and education in the interdisciplinary field of religion and science, beginning with a discussion of the nature of feminist classrooms as a

setting for action. I present some theoretical and practical issues to consider when developing a feminist praxis and an antisexist curriculum, followed by a discussion of the role of language and critical reflection in the religion and science classroom, the risks associated with reflective discourse, and considerations in the use of “feminist” teaching tools such as small group work, journals, and portfolio assessment. I conclude with a reflection on how feminist pedagogy promotes an epistemology that speaks to the hearts and minds of participants in the dialogue of religion and science.

THE FEMINIST CLASSROOM AS A SETTING FOR ACTION

A feminist approach to education requires political judgment concerning the nature of a just society. Social justice is embodied in specific political options, and students need to become aware of and act on those options. Maintaining a critical stance is not simply a classroom exercise. It must extend beyond the classroom to investigate the contexts of power and control within which educational and social values are generated (Golby 1990).

From a feminist perspective, religion and science education is inherently linked to action. Its conscious purpose is to integrate action and scholarship in order to promote social change. Both the personal and the political become incorporated into the knowledge generated and the action undertaken. It consciously addresses our responsibility to act on what is known by providing an opportunity to formulate a theory of action which students and educators can draw upon.

As educators we can increase our awareness of the difficulties faced by girls and women in science and religion by networking with like-minded practitioners. Then we can problematize and critique our own teaching practice and gender biases. How do they disadvantage girls and women? Through “reflection in action” (Schon 1983) our taken-for-granted positions and actions as educators can be made explicit, critically examined, reformulated, and tested in further action. Through this process, professional knowledge and improvement of professional practice in religion and science occur simultaneously.

Feminist Praxis. Feminist strategies for educational reform necessitate attention to what is taught and assessed in the science and religion classroom, and to how and why it is taught and assessed. They recognize education both as a site for struggle and as a tool for change, a site in which thought and action (or theory and practice) form a dialectically related praxis. Bentley and Watts (1986), Kenway, Willis, Blackmore, and Rennie (1994), Jones (1985), and Weiner (1994), among others, present important issues of concern in science education that I view as integral to a feminist praxis in religion and science. From these sources and my own experiences, I present a list of things to consider for those attempting to construct such a praxis. A feminist praxis:

- shows awareness of inequities in the science and religion classroom and of how and why the positions assumed influence effective teaching and learning.
- recognizes struggle as a necessary part of the critique of dominant social structures in religion and religion education.
- is committed to collective and individual empowerment.
- shows awareness of the philosophical and psychosocial elements of learning.
- supports the self-confidence of members of disadvantaged groups. For example, in Afrocentric communities, personal and subjective ways of knowing are often valued and emphasized over abstract, objective knowledge (Manicom 1992). The challenge for feminist educators is to construct and present a curriculum that acknowledges alternate ways of valuing personal knowledge. The religion and science classroom needs to address the multiple, interacting, and shifting needs, talents, and realities of all its students, including those who are multiply affected by sex, race, class, and sexual orientation.

Feminist Science and Religion Curriculum. In a feminist framework, teaching and learning are moral, ethical, and political activities that focus on enabling participants to view critically and act responsibly toward the empirical understanding and actions of science and religion. Dialogue is stressed as a means to understand and work within difference in science and religion. A feminist curriculum illustrates the nature of religious and scientific knowledge by:

- using material on women in science and religion that addresses their careers and experiences in those areas.
- incorporating and validating personal experience as a source of knowledge.
- promoting a range of ways of knowing and practicing religion and science.
- drawing attention to literary and metaphorical devices used in science and religion.
- emphasizing what constitutes evidence and explanation in religion and science and the relationship between them.
- helping students deconstruct the “normal” organization of science and religion in order to reconstruct it and themselves as actors in its political processes.
- expanding the kinds of religious and scientific observations considered acceptable in classroom practice.
- helping students develop a sense of the contextuality of scientific and religious knowledge.

- making explicit that creating religious and scientific facts is a social enterprise.
- investigating how specific historical, cultural, and institutional contexts lead to specific forms of action in religion and science.

Clearly, a feminist science and religion curriculum necessitates a re-visioning of the social norms underpinning the supposedly value-neutral nature of scientific knowledge (Code 1991; Bentley and Watts 1986). Critical understandings of how social, political, and emotional commitments and assumptions (conscious or not) of individuals and groups influence science and religion need to be developed by educators and students. Then alternative understandings can be explored of (1) how scientific and religious beliefs and knowledge are grounded in social experiences and (2) the type of experience that should ground religious and scientific beliefs and knowledge.

Language in the Religion and Science Classroom. Language, according to Vygotsky (1978), is one of the most powerful and common tools mediating the formulation and solution of problems in goal-directed social activity. The language we employ in theory building or in describing and interpreting events is a social construct and therefore reflects the interests and values of the social group that developed it. Our use of language in religion and science reflects our shared interpretations and common symbolic representations about events, relationships, and goals.

Feminist approaches to education sensitize students to the non-neutral nature of language, help them to critique and investigate the assumptive basis of their own language use, and help them better to understand and act on their practices and beliefs in science and religion (Wells 1994). They do so by encouraging students to “talk” both publicly (in the classroom, with each other) and privately (in journals, portfolios, and assignments) about their understandings of religion and science. These self-reports help to clarify how students understand and define the matters being discussed. Public discussion in a group or a classroom slows down action so that participants can reflect on, critically interpret, and change the tacit understandings that motivate their actions and opinions (Argyris, Putnam, and McLain-Smith 1985). Through public talk, students can find their voices among the voices of others and develop a language that represents their experiences in religion and science. Talk also provides the educator with “a window on practical reasoning” of students (Argyris, Putnam, and McLain-Smith 1985).

Critical Reflection through Classroom Discourse. The classroom is a useful place for testing ideas, assumptions, judgments, and schemata against those of others (Abercrombie 1967). In it, students may share and examine their experiences together in enough detail to reach a better understanding of both theory and practice in religion and science. This sharing

can be translated into action by enabling students to make sounder judgments about the validity of claims in both fields.

The discourse evolving from classroom activities aims to involve and foster critical reflection, the process by which we make sense of and judge evidence from theory or from practical experience (Winter 1989). Through critical reflection, students articulate and clarify their tacit knowledge of ideas about the nature of religion and science, and they have opportunities to hear and develop their own voices in the religion and science discourse. The concept of “voice” includes a subject’s perspectives, concepts, intentions, and worldview (Mikhail Bakhtin, in Wertsch 1991; Gilligan 1982). Reality is multivoiced, and multiple perspectives, including voices distant from the immediate dialogue (the theoretical community, peers, friends, critics, and so on) can be considered through dialogue with others.

Personal Theory Building. Dialogue in the classroom provides a context for personal theory building in which students can hone their intellectual independence—the capacity to make defensible judgments about the validity of claims (Munby 1980). Through discussion one may discover the strengths and weaknesses of one’s theories and unrecognized assumptions and weigh them against alternative interpretations presented by others in the class. Group discussion provides a means for altering or reconstructing problems in a helpful and positive way. Each student will extract different things from the conversation, and discussion of these different reactions will involve exploring the assumptions and information held by each, leading to testing and perhaps modification of students’ own perceptions and practices. The process allows students to identify and verbalize their assumptions and knowledge, leading to increased involvement and more effective learning (Abercrombie 1967).

Dialogue is Risky. Critical reflection can be risky, because the process critiques basic assumptions of participants about their abilities, how the world works, and their expectations about behavior in the scientific and religious communities. Questioning tacit knowledge in the scientific and religious domains can be psychologically difficult; what we see as fundamental and fixed assumptions are often only options among various alternatives. New insights may be difficult to incorporate into the “structure of our assumptive world” (Brookfield 1990, 180) and may challenge our central beliefs and values.

Ideally, a feminist classroom emphasizes dialogue and interaction in order to make it possible for participants “to relinquish the security of thinking in well-defined, given channels and to find a new kind of stability based on the recognition and acceptance of ambiguity, uncertainty and open choice” (Abercrombie 1967, 141). However, a fear of ambiguity and uncertainty during reflective group conversations can lead to difficulties. The learning process can be a threat to the taken-for-granted processes

that we use to cope (Goleman 1985). Students may act defensively to ward off threat through responses such as withdrawal, self-censorship, and face-saving.

To understand this more fully, consider the demands that free and open inquiry exert. Participants must be able to retrieve largely tacit inferential processes; they must be able to deal openly with challenges and conflicting views; they must reveal information that might expose their own or others' vulnerabilities; they must be able to recognize and acknowledge when they are wrong; and they must feel free to choose among competing views. (Argyris, Putnam, and McLain-Smith 1985, 238)

Examination of our implicit theories, especially in the politically and often personally sensitive area of religion and science, is clearly not a risk-free process. All participants in the discourse must take it upon themselves to provide the emotionally and intellectually supportive environment needed to minimize the potential risks of the process for themselves and for others. Respect for the voices, knowledge, and beliefs of those involved in discussions must be maintained by every participant.

A Transfer of Training. Classroom dialogue facilitates a "transfer of training" by which individuals learn to apply the useful theory and practice of religion and science to their own situations (Abercrombie 1967) and to appropriate the language of these fields for their own intentions and contexts (Bakhtin, cited in Wertsch 1991). The role of the educator in this process is to facilitate the examination and understanding of individual and group experiences in order to enable students to change their understandings in a desired direction in light of theory.

The transfer of training encouraged by classroom dialogue is not simply a process of obtaining objective information about religion and science and then applying it (see Geddis 1993). Feminist education aims to help participants to know more deeply as much as to have more knowledge. Classroom discussion tends to be neither wholly academic nor strictly practical. It is consciously related to the issues faced by students in their dealing with religion and science in order to address problems they perceive as needing action. Group discussion makes explicit the nature of the dialogue between theory and practice in religion and science, and hones participant ability to discuss and judge the validity of educational claims.

REFLECTIVE TOOLS TO ENGAGE THE HEART AND MIND

Three teaching tools are often used in feminist classrooms to enhance the effectiveness of student dialogue and reflection: small group work, journals, and portfolios.

Small Group Work. Science and religion are social and cooperative activities, and feminist educators assert that the learning environment should reflect those traits. Therefore, group work is often central to feminist efforts

to promote action in both the theoretical and practical domains. The involvement and participation encouraged by group work promotes the personal sense of ownership of issues necessary for both theory generation and practical action.

Learning, according to L. Vygotsky (1978), is the appropriation of cultural practices and knowledge through purposeful, social activity undertaken jointly with others. Small group work with students exploits the social nature of learning by encouraging collaborative dialogue among participants about their understandings in religion and science and by stimulating the developmental processes that are needed to trigger conceptual change in participants (Geddis 1993; Wells 1994).

Vygotsky theorized that an essential feature of learning through discourse is the creation of a “zone of proximal development”—a conceptual space just beyond the learner’s current competencies—to trigger internal development processes that can operate only through interaction with people. Interaction with others supports, or “scaffolds,” the development of these competencies. Students in the classroom make explicit their personal zones of proximal development by investigating issues in religion and science about which they are dissatisfied and wish to learn more. The classroom becomes a place to discover the reasons for and solutions to the lack of congruence. “Scaffolding” is a useful metaphor to conceptualize the supportive role of the educator and classmates in this process.

Journals. Journals highlight the lived experiences of individual students in the fields of religion and science, often in the form of anecdotes and stories that describe their understandings and explain their actions. Because entries emanate from the language, questions, and frameworks of students, they become an important resource for learning, collegial sharing, and clarification of individual and group concerns. Journals can help students engage in the religion and science dialogue on a variety of levels. As a researcher and teacher, I have found journals useful for a number of reflective functions (Nyhof-Young 1997) that benefit individuals, groups, and educators. For the individual, it is

1. a private window through which to examine thoughts, feelings and action strategies.
2. a historical record of progress in thinking and learning about religion and science, a tool for recalling personal responses to a situation as it was at the time.
3. a communicative tool that illustrates how student knowledge and ways of knowing are expressed in the classroom and group practice.

For groups, the journal is

1. a tool for collegial sharing in groups that allows participants to control

- the release of understandings and engage in more effective self-disclosure in the classroom.
2. a group resource for sharing perspectives and suggestions about the group task that can be acted on in the group.
 3. a tool to promote systematic reflection about the group experience and individual growth in the group.

For educators, it is

1. a resource for clarification of group processes and dynamics.
2. a source of a second-order inquiry into the religion and science dialogue.
3. a historical and personal record of teaching and research.

Computer technology offers additional ways to increase the usefulness of journals. Students might contribute to a class data-line or chat-room by e-mail, responding to the comments of others as they see fit. Similarly, allocating specific class time for group sharing or exchange of journal entries to address group and individual concerns may increase their usefulness in learning.

A key observation from the use of journals in my own situation as a teacher educator is the importance of not crossing alternative lines of communication. Keep matters concerning the classroom dynamics in play within the class; do not allow them to be privatized in individual reflection or research. My concerns about journals include:

1. There may be confusion between individual and class lines of communication (for example, discussing group dynamics issues in journals rather than raising them with the group).
2. Journals are useful individual reflective tools. Sometimes it is difficult for students to “switch gears” and use them as a group tool.
3. The role of journals as a reflective tool for students can be distorted by their role in the research of the educator.
4. Journal writing may become a technical assignment rather than a tool for critical reflection.
5. Journal entries can be short, terse, and not very reflective (keeping a reflective journal is a learned skill, and time consuming).
6. Ethical concerns can arise about privacy and confidentiality.

Potential tensions between the multiple uses of journals seem to be best dealt with as they occur by making them explicit in the class. My major focus in the use of reflective tools such as journals and portfolios is to maintain openness and ownership of the reflective process by class participants. Similarly, I expect students to work to maintain privacy and confidentiality about what is reflected on within the classroom.

Portfolios. Portfolios are purposeful collections of students' work that show their effort, progress, and achievements. Student-generated portfolios are generally an unfamiliar form of assessment in both the graduate and undergraduate classrooms. Therefore, the nature of such a flexible and open-ended course assessment requirement needs to be clearly laid out for participants. In theory, portfolios enable students to focus their efforts on relevant and personal practical concerns and the learning process in a form worth substantial time and effort. However, in practice, students are well aware of potential contradictions between the rhetoric of a personalized, relevant classroom process and the competitive realities of a university setting that ranks products for institutional assessment. Fears of inconsistencies need to be addressed early in the process. The emphasis of academia on grades and scholarship cannot be underestimated as a factor in both the process and product of teaching and learning.

In summary, educators need to be explicit about their expectations for the use of specific tools for teaching and assessment. The use of theoretical readings, for example, may generate a tension between expectations that classroom experiences will deal with the theoretical knowledge of religion and science and expectations that they will promote education that is intrinsically motivated and driven by personal, practical knowledge and need. The two are not mutually exclusive. For example, student feedback about the usefulness and applicability of theoretical readings for critical reflection, the use of readings provided by students themselves, and the provision of airtime in the class to evaluate and reflect on readings in ways that link them with personal ideas and context can provide important means of balancing a theoretical and personal focus in the religion and science classroom. Students need to build their own practical theories based on a dynamic interaction of internally and externally generated theories (Abercrombie 1967).

CONCLUSIONS

Successful education in religion and science speaks to the hearts as well as the minds of learners, primarily through an emphasis on self-knowledge. Its goal is to enable students to participate fully, confidently, and openly in the science-and-religion dialogue. Feminist pedagogy promotes that goal. Through classroom dialogue encouraged by teaching tools such as journals, group discussion, portfolios, and readings, students can gain the confidence and knowledge necessary to create a critically reflective culture that initiates and sustains student-led reflection and supports wider public deliberations about religion and science.

My experiences with feminist pedagogies suggest that in order to be successful, education in religion and science needs to develop an epistemology that

1. presents knowledge as contextualized and personalized.
2. presents knowledge as reflecting multiple perspectives.
3. acknowledges the emotional, psychological, and spiritual dimensions of knowledge.
4. shows knowledge as strongly influenced by the tacit assumptions that underpin our understanding and actions.
5. shows knowledge as constructed and open to change and problematization through dialogue.
6. supports and critiques knowledge generation by students and educators.
7. constructs knowledge in tasks that engage that knowledge.

The extent to which education in science and religion develops similar understandings in students is an indicator of its success in providing support and learning opportunities. As learners develop an epistemology that makes greater space for alternative views of knowledge, they will be more able to participate effectively and confidently in the religion and science dialogue and pass on their understandings to others. By encouraging such development, religion and science education will encourage learning and teaching that are less of a technical exchange of commodities (information, knowledge, status) and a struggle between dualities (theory/practice, heart/mind, intuition/reason), and more of an emancipatory discourse. In the process, alternative visions of how to address areas of concern in religion and science can be problematized, negotiated, and acted upon.

REFERENCES

- Abercrombie, M. L. J. 1967. *The Anatomy of Judgement*. London: Hutchinson and Co.
- Argyris, C., R. Putnam, and D. McLain-Smith. 1985. *Action Science: Concepts, Methods and Skills for Research and Intervention*. San Francisco: Jossey-Bass.
- Barr, J., and L. Birke. 1994. "Women, Science and Adult Education: Toward a Feminist Curriculum?" *Women's Studies International Forum* 17:473-84.
- Belenky, M. F., B. M. Clinchy, N. R. Goldberger, and J. M. Tarule. 1986. *Women's Ways of Knowing: The Development of Self, Voice, and Mind*. New York: Basic Books.
- Bentley, D., and D. M. Watts. 1986. "Courting the Positive Virtues: A Case for Feminist Science." *European Journal of Science Education* 8:121-34.
- Briskin, L., and R. P. Coulter. 1992. "Feminist Pedagogy: Challenging the Normative." *Canadian Journal of Education* 17:247-63.
- Brookfield, S. 1990. "Using Critical Incidents to Explore Learners' Assumptions." In *Fostering Critical Reflection in Adulthood: A Guide to Transformative and Emancipatory Learning*, ed. J. Mezirow. San Francisco: Jossey-Bass.
- Brophy, J. E., and T. L. Good. 1974. *Teacher-Student Relationships: Causes and Consequences*. New York: Holt, Rinehart, and Winston.
- Clark, C. M., and J. L. Elmore. 1981. *Transforming Curriculum in Mathematics, Science, and Writing: A Case Study of Yearly Planning*. Research Series No. 99. East Lansing: Michigan State Univ., Institute for Research on Teaching.
- Code, L. 1991. *What Can She Know?* Ithaca, N. Y.: Cornell Univ. Press.
- Connelly, F. M., and D. J. Clandinin. 1988. *Teachers as Curriculum Planners: Narratives of Experience*. Toronto, Ont.: OISE Press.

- Fox Keller, E. 1992. *Secrets of Life, Secrets of Death: Essays on Language, Gender and Science*. New York: Routledge.
- Geddis, A. 1993. "Transforming Subject-Matter Knowledge: The Role of Pedagogical Content Knowledge in Learning to Reflect on Teaching." *International Journal of Science Education* 15:673-83.
- Gilligan, C. 1982. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge: Harvard Univ. Press.
- Golby, M. 1990. "Teachers and Their Research." In *Quality in Teaching: Arguments for a Reflective Profession*, ed. W. Carr. London: Falmer Press.
- Goleman, D. 1985. *Vital Lies, Simple Truths: The Psychology of Self-deception*. Toronto, Ont.: Simon and Schuster.
- Goodman, J. 1992. "Feminist Pedagogy as a Foundation for Reflective Teacher Education Programs." In *Reflective Teacher Education: Cases and Critiques*, ed. L. Valli. Albany: State Univ. of New York Press.
- Harding, S. 1986. *The Science Question in Feminism*. Ithaca, N.Y.: Cornell Univ. Press.
- . 1991. *Whose Science? Whose Knowledge?* Milton Keynes: Open Univ. Press.
- Harding, S., ed. 1993. *The "Racial" Economy of Science: Toward a Democratic Future*. Bloomington: Indiana Univ. Press.
- Jones, C. 1985. "Sexual Tyranny: Male Violence in a Mixed Secondary School." In *Just a Bunch of Girls*, ed. G. Weiner. Milton Keynes: Open Univ. Press.
- Kahle, J. B., and L. J. Rennie. 1993. "Ameliorating Gender Differences in Attitudes about Science: A Cross-National Study." *Journal of Science Education and Technology* 2:321-33.
- Kelly, A. 1988. "Gender Differences in Teacher-Pupil Interactions: A Meta-Analytic Review." *Research in Education* 39:1-23.
- Kenway, J., S. Willis, J. Blackmore, and L. Rennie. 1994. "Making 'Hope Practical' Rather Than 'Despair Convincing': Feminist Post-structuralism, Gender Reform and Educational Change." *British Journal of Sociology of Education* 15:187-209.
- Luke, C., and J. Gore, eds. 1992. *Feminisms and Critical Pedagogy*. New York: Routledge.
- Manicom, Ann. 1992. "Feminist Pedagogy: Transformations, Standpoints, and Politics." *Canadian Journal of Education* 17:366-89.
- Mearor, L. 1983. "Gender and the Sciences: Pupils' Gender-Based Conceptions of School Subjects." In *Curriculum Practice*, ed. M. Hammersley and A. Hargreaves. New York: Falmer Press.
- Munby, H. 1980. "Analysing Teaching for Intellectual Independence." In *Seeing Curriculum in a New Light: Essays from Science Education*, ed. H. Munby, G. Orpwood, and T. Russell. Toronto, Ont.: OISE Press.
- Nash, M., T. Allsop, and B. Woolnough. 1984. "Factors Affecting Pupil Uptake of Technology at 14+." *Research in Science and Technological Education* 2:5-19.
- Noddings, N. 1984. *Caring: A Feminine Approach to Ethics and Moral Education*. Berkeley: Univ. of California Press.
- . 1992. *The Challenge to Care in Schools*. New York: Teachers College Press.
- . 1993. *Educating for Intelligent Belief or Unbelief*. New York: Teachers College Press.
- Nyhof-Young, J. 1997. *Action Research in Gender Issues in Science Education: Towards an Understanding of Group Work with Teachers*. Ph.D. diss., Univ. of Toronto.
- Schniedewind, N. 1987. "Teaching Feminist Process." *Women's Studies Quarterly* 15:15-31.
- Schon, D. A. 1983. *The Reflective Practitioner*. New York: Basic Books.
- Vygotsky, L. 1978. *Mind in Society: The Development of Higher Psychological Processes*. Cambridge: Harvard Univ. Press.
- Weiner, G. 1994. *Feminisms in Education: An Introduction*. Philadelphia: Open Univ. Press.
- Wells, G. 1994. *Changing Schools from Within: Creating Communities of Inquiry*. Toronto, Ont.: OISE Press.
- Wertsch, J. 1991. *Voices of the Mind: A Sociocultural Approach to Mediated Action*. Cambridge: Harvard Univ. Press.
- Winter, R. 1989. *Learning from Experience: Principles and Practice in Action-Research*. London: Falmer Press.