ABSTRACT

This study of teaching practices adds to the scholarship of teaching in family science by providing a model of classroom research. Three researcher-instructors systematically investigated their teaching practices, utilizing qualitative methods that included multiple classroom observations as well as semi-structured interviews with students. Their analysis and findings were grounded in a four-stage model of student intellectual development and in Vygotsky's theory of the zone of proximal development. Several teaching practices were identified as being most useful at specific stages of student development; some problematic practices also were identified. In addition, two barriers to intellectual development were identified: affective issues and a rule of social harmony. These findings have implications for instructional practices, curriculum development, and post-graduate professional development in family science. In addition, more classroom research in family science should be encouraged.

INTRODUCTION AND CONCEPTUAL FRAMEWORK

Family scientists devote considerable attention to the scholarship of teaching (Lamke, 1997), through journal articles and professional presentations, including the annual conference of the Family Science Association. The use of non-traditional methods such as cooperative learning has been reported (Walker, 1996), and teaching methods unique to the study of families also have been described (Fisher & Day, 1990; Weber-Brax & Poirier, 1994). To date, there have been almost no reports of teaching practices in family science that are grounded in classroom research, although Burr and Burr (1990) used an experimental post-test design to test the efficacy of study guides. The study reported here is based on a systematic investigation of classroom teaching practices. This work seeks to advance the scholarship of teaching (Boyer, 1987; Glassick, Huber & Maeroff, 1997).

Direct correspondence to the first author: Department of Family and Consumer Sciences, University of Wyoming, P.O. Box 3374, University Station, Laramie, WY 82070-3374 (busers@uwyo.edu). The second author is in the same department, while the third author is in the Department of Early Childhood/Elementary Education at the same institution. This study was supported by a Faculty Grant-In-Aid from the Office of Research, University of Wyoming.

Key Words: intellectual development, teaching methods, curriculum development.

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Teaching practices were the object and focus of this study, but the authors recognized that teaching practices are grounded in assumptions about the linkage between teaching and student intellectual development. To clarify assumptions, two guiding conceptual frameworks were needed: one to describe how teaching practices are connected to student development and another to describe students’ stages of intellectual development. To explain how teaching practices are linked to intellectual development, Vygotsky’s (1978) Theory of the Zone of Proximal Development was chosen. Vygotsky was concerned that teaching often focuses on students’ established level of development, rather than on the next higher level. He encouraged teachers to focus on the Zone of Proximal Development, which is “the distance between the actual developmental level as defined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or collaboration with more capable peers.” (Vygotsky, 1978, p. 86) According to this theory, specific teaching practices operate as scaffolds that students can use to move from their actual developmental level (where they do not need instruction) to a new level of thinking. This analogy of teaching as scaffolding enables teacher-researchers to systematically study their teaching practices, to identify those practices that most effectively promote development to the next higher stage of intellectual development.

In addition to using Vygotsky’s theory of scaffolding, teacher-researchers also need a clear model of student intellectual development. A number of conceptual frameworks of intellectual development in college and adulthood were examined for their usefulness to this study (Belenky, Clinchy, Goldberger & Tarule, 1986; Chickering & Reisser, 1993; King & Kitchener, 1994; Kuhn, 1990; Magolda, 1992; and Perry, 1968). Several criteria aided in determining the usefulness of a guiding framework for classroom research: a) the framework should have some empirical basis; b) it should be easily applied to selecting and designing instructional methods; c) it should be easy to recall in the classroom, to spontaneously assess a student’s level of intellectual development; and d) it should be congruent with the authors’ own social constructivist perspective. (For further information on models of student intellectual development, see Quoss, Cooney & Williams, forthcoming.) Frameworks by Perry (1968) and Kuhn (1990) were combined into a composite, four-stage model, briefly described here. Perry’s nine-stage model (1968) has been adopted by many college instructors (Kloss, 1993), but it was judged to be too complex for easy recall. Therefore, for this study, Perry’s scheme was collapsed into three broad stages: Duality (either/or, right/wrong thinking); Multiplicity (existence of differing perspectives is accepted); and Relativism (the uncertainty of knowledge is accepted). Kuhn’s (1990) three-stage model delineates three paradigms for thinking about knowledge, including two stages that overlap with Perry’s model (Absolutist and Multiplist) with a different third stage, Evaluativist, in which ideas are coordinated with evidence. Kuhn’s third stage was judged to be particularly helpful because it defines so clearly the essence of critical thinking. Adding Kuhn’s Evaluativist stage to the abbreviated three-stage Perry model created a guiding framework that met all the criteria of usefulness.

This composite model assumes that most students enter college as Absolutist thinkers. Absolutist thinkers view the professor as an authority whose role is to pass on the facts and to provide correct answers and right theories. As students develop into the second, Multiplist stage, knowledge is constructed yet they commit to the effort to learn and understand the worth of evaluating, choosing, and applying standards of logic, evidence, criteria, or principles. Relativism, students fully accept the uncertainty of constructed, yet they commit to the effort to...

METHOD

Boyer’s (1987) call for more attention to a wave of research on classroom teaching (Anderson & Weimer (1998) recently emphasized the need for their teaching in classroom research. However, traditional research methods to the dynamic trends in higher education. Based on their extensive longitudinal study of students and Terenzini (1991b) have called for the use of qualitative methods to uncover the subtle events that promote intellectual growth and in their own learning and intellectual development. To answer the question: What teaching practices do students to move from one stage of intellectual development, vygotsky’ s (1978) Theory of the Zone of Proximal Development was chosen. Vygotsky was concerned that teaching often focuses on students’ established level of development, rather than on the next higher level. He encouraged teachers to focus on the Zone of Proximal Development, which is “the distance between the actual developmental level as defined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or collaboration with more capable peers.” (Vygotsky, 1978, p. 86) According to this theory, specific teaching practices operate as scaffolds that students can use to move from their actual developmental level (where they do not need instruction) to a new level of thinking. This analogy of teaching as scaffolding enables teacher-researchers to systematically study their teaching practices, to identify those practices that most effectively promote development to the next higher stage of intellectual development.

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into the second, Multiplist stage, knowledge is understood as a matter of opinion; therefore professors are expected to encourage exploration of knowledge from a variety of perspectives. However, all opinions and perspectives are considered to be equal in value. Only when they reach the third, Evaluativist stage do students learn to understand the worth of evaluating, choosing, or judging among interpretations by standards of logic, evidence, criteria, or principles. In the fourth stage, Commitment to Relativism, students fully accept the uncertainty of knowledge, i.e., that it is constructed, yet they commit to the effort to search for the best decisions.

**METHODS**

Boyer’s (1987) call for more attention to the scholarship of teaching initiated a wave of research on classroom teaching (Angelo, 1991; Cross, 1996). Menges and Weimer (1998) recently emphasized the need for more academic instructors to ground their teaching in classroom research. However, there are great challenges in applying traditional research methods to the dynamic environments of college classrooms. Based on their extensive longitudinal study of learning in the college years, Pascarella and Terenzini (1991b) have called for “greater dependence on naturalistic and qualitative methods” to uncover the subtle events that affect learning in classrooms. Subsequently, Fetterman (1991) edited a collection of articles based on the use of qualitative methods in institutional research. Kuh and Andreas (1991) defined the critical question that should determine the choice between a quantitative or a qualitative approach to investigating classroom events: “does the nature of the research . . . question require in-depth, detailed descriptions from the points of view of a variety of people to accurately describe, understand and explain what is happening?” (p. 198) The researchers for this study were most interested in identifying classroom events that promote intellectual growth and in understanding how students perceive their own learning and intellectual development. Therefore, qualitative methods were used to answer the question: What teaching strategies function best as scaffolds for students to move from one stage of intellectual development to the next?

**PROCEDURES**

During the 1997-98 academic year, the three researcher-instructors conducted classroom observations in six college courses with a total enrollment of 193 (183 women and 10 men), as well as interviews with students enrolled in these courses. Half the courses observed for this study were sophomore level and half were senior level; both upper and lower level family science and early childhood courses were represented. The students, as well as the institution where the data were collected, were predominantly white, and the majority had rural or small-town backgrounds. The semi-structured interviews were conducted with nine students, all females, selected to provide a potential range of stages of intellectual development, balance in terms of traditional/non-traditional backgrounds, and representation of the majors involved.
An observation form was designed to document targeted aspects of the teaching and learning process (see Figure 1), and each instructor was observed twice by the two other researchers, for a total of twelve observations. These observations were arranged in advance. (All three researchers have conducted previous observational studies and also have taught observation techniques.) Guiding questions (see Figure 2) were used for interviews; question two was of particular importance since it provided student perceptions of specific classroom events that could be compared with observational data and instructor perceptions. The interviews, which were audio-taped and transcribed, were conducted near the end of each semester, in instructors’ offices, vacant classrooms, and students’ homes. In addition to the observations and interviews, artifacts such as course syllabi, assignment guidelines, grading rubrics, and journals used by each instructor to record notes after class meetings were collected for background analysis and documentation.

FIGURE 1
Observation Form

<table>
<thead>
<tr>
<th>Course:</th>
<th>Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observer:</td>
<td>IN = Intellectual Development</td>
</tr>
<tr>
<td>Date:</td>
<td>E = Ethical Reasoning</td>
</tr>
<tr>
<td>Time:</td>
<td>Id = Identity Development</td>
</tr>
</tbody>
</table>

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FIGURE 2
Interview Questions

1. What do you feel you are learning in this class?
2. What do you remember (cite incident or discussion that took place in a class you observed)? What was going on in your mind during that activity/discussion? What was the most important point? What did the instructor do/say that was helpful to you? What do you wish had happened?
3. What topic in class was the most intriguing to you or caused you to think most deeply? What was challenging about it for you? Are you satisfied at this point with what you have learned yet regarding that issue? What have you been doing to address the issue?
4. Describe a situation that came up in class or outside of class this semester that you consider to be an ethical issue. Can you identify any changes in how you approach ethical reasoning that are a result of what you have learned in this course?
5. Is there anything else you can tell me about the class and how it has changed you thinking or developed your ethical reasoning?
The researchers met in bi-weekly sessions to analyze their coded field notes and interview transcriptions, using a grounded theory approach (Strauss & Corbin, 1990). Working hypotheses were developed and then tested against the data sources, using constant comparative analysis. Artifacts and journals were consulted to clarify questions that emerged from analytic discussions. Broad topics were generalized from the various hypotheses, and memos were written to identify sources of data as evidence for each topic, providing documentation that the procedure of triangulation was followed for all findings. Memos were re-examined during collaborative discussions, and the data sources were re-read until thick descriptions could be provided, to support application of findings to other settings (Firestone, 1993).

**Scope of Generalizability.** Firestone’s (1993) analysis of generalizability from different approaches to inquiry affirms that this study cannot be generalized to the entire population of college students, nor even to the population of public undergraduate programs in family science or early childhood. However, the multi-site nature of the research design (six courses and twelve classroom observations) does strengthen its potential for applicability, based on Firestone’s criteria. In addition, the research design and methodology offer a model for other classroom studies.

**MAJOR FINDINGS AND CONCLUSIONS**

Those teaching practices that most effectively promoted student intellectual development are described below, as well as an example of ineffective practice. A brief discussion of curriculum issues follows the discussion of teaching practices. In addition, two important findings are discussed regarding barriers to intellectual development among students in family science and early childhood.

**TEACHING AND CURRICULUM**

*Teaching Practices.* The guiding framework of this study describes Absolutist thinkers as being characterized by a preference for learning facts, concrete information, and specific techniques. The Absolutist thinkers in this study benefited from instruction that began with facts and specific observations, then asked for generalizations from those facts. It was particularly effective to begin with activities that functioned as familiar matching exercises, with specifics matched to general principles in a simple use of inductive reasoning. For example, in teaching “developmentally appropriate practice” (DAP) in an early childhood course, the instructor had written six principles of DAP (previously introduced) on the chalkboard, before the class meeting began. She began the class by asking students to share observations they had made that week in the child development teaching laboratory. From time to time she would ask, “What DAP principle does your observation illustrate?” and write a brief reference to each observation, next to the principle identified. At the conclusion of the sharing experience, she stated, “Now let’s review what we learned about DAP” and led a review discussion. Her use of concrete illustrations, matched to abstract principles, demonstrated effective
scaffolding. Absolutist thinkers were guided from thinking about concrete facts to using abstract, inductive reasoning. (Observation Q3, 2-15-98)

This instructional strategy of inductive matching exercises was further developed to provide a scaffold to Multiplist thinking, as illustrated in the next classroom example. Brief case situations were read of ethical dilemmas that college students might experience (concrete, familiar experience). After each case was read, students as a class were asked to suggest as many solutions as possible (Multiplistic thinking), and their responses were written on the blackboard. Next, they were asked to suggest any ethical principles or virtues that seemed to guide their solution suggestions (requiring a more abstract level of inductive reasoning but still with familiar experiences). Students named such virtues as honesty, fairness, and trust. The instructor then shifted their thinking from character-based virtues to professional ethical principles, by giving handouts that described professional ethical principles for five core issues: responsibility, competence, power, privacy/confidentiality, and professional/public relationships. After these principles were discussed, handouts of professional practice dilemmas were provided. Students in small groups were asked to identify which professional principles were involved in each case and to attempt but not force agreement on a resolution to the dilemma. Again, they were engaged in a matching exercise with inductive reasoning, but group members additionally had to acknowledge and make an effort to negotiate their differing perspectives, and then to develop a resolution based on principles (Multiplist thinking with exposure to Evaluativist thinking). (Observation P1, 10-25-97)

This entire teaching/learning experience stretched students well beyond Absolutist thinking, but the grounding in concrete, familiar experience, with scaffolding through peer interactions, worked effectively. However, when a similar written activity (for grade) required students individually to determine alternative resolutions to a professional case situation (requiring Multiplist thinking) and then to choose and defend one resolution based on guiding principles (requiring extensive Evaluativist thinking), students responded with confusion and anxiety. As a result, students were discouraged about their intellectual abilities. "I had a hard time with it because I . . . I'm not, I guess, educated enough to. . . know what she wanted." (Interview with Lacy, 12/11/97, p. 4) This final exercise required a class of sophomores to perform too far beyond their modal stage of thinking and too far outside their zone of proximal development for this classroom activity to serve as a scaffold.

These examples demonstrate that students in lower-level courses are able to easily complete guided activities that involve inductive logical thinking. However, they do not necessarily perceive the process of their thinking and therefore cannot consciously choose to continue using logical thinking. As Lowman (1996) notes, sensitizing students to their own cognitive processes is a key to effective teaching and learning. Absolutist thinkers in particular tend not to be highly aware of their own cognitive processes, therefore, they benefit from instructional experiences to promote metacognition. An instructional experience from the present study, identified as an effective teaching practice, promoted metacognition by developing awareness of inferencing. Sophomore-level students as a class completed the Uncritical Inference Test (Haney, 1983), that asks questions about several stories, with true, false, and ? (ambiguous) answers. In discussing each answer, the instructor asked students to find factual evidence in the story, building on Absolutist abstract thinking while also exposing them to thinking with evidence). Questions with ? answers were constructed logically to support ambiguous questions, students were asked to give a true or false conclusion (which the instructor of inferencing was then emphasized and a handout was frequently used, as a scaffold to metacognition on inferences.

Curriculum Issues. Because intellectual development is a long-term process, curriculum organization should be based on students' modal stage of intellectual development. The present study, Absolutism and Multiplism, suggested that multiplistic thinking, the ability to engage in complex Evaluativist thinking, the ability to resolve professional dilemmas, the ability to think abstractly, was difficult in upper-level courses. These findings suggest that curriculum level courses focus on promoting student professional intellectual development to the second, Multiple thinking, as simple forms of Evaluativist thinking in lower -- but a predominant instructional focus on higher in upper-level courses. As Terenzini, Sleeter, and the National Governors Association concluded from their research, "Individual courses in the liberal arts they would take in college reinforce gender differences
factual evidence in the story, building on Absolutists’ preference for factual rather than abstract thinking while also exposing them to Evaluativist thinking (coordination of thinking with evidence). Questions with ? answers had no clear concrete evidence, but many were constructed logically to support a true or false statement. For these ambiguous questions, students were asked to assess the degree of confidence they felt in a true or false conclusion (which the instructor relabeled an inference). The concept of inferencing was then emphasized and a handout provided. Subsequently, the term was used frequently, as a scaffold to metacognitive awareness of logical thinking based on inferences.

Curriculum Issues. Because intellectual development during the college years is a long-term process, curriculum organization as well as teaching practices should be based on students’ modal stage of thinking at different course levels. In the present study, Absolutism and Multiplism were the modal stages of intellectual development for students in lower level courses. When these students were asked to engage in complex Evaluativist thinking, the results were problematic. For some, Evaluativist thinking remained difficult in upper-level courses, and only a few reached Relativism. These findings suggest that curricula should be organized so that lower-level courses focus on promoting student progress from the first, Absolutist stage of intellectual development to the second, Multiplist stage. Students may be exposed to simpler forms of Evaluativist thinking in lower-level courses -- as we describe below -- but a predominant instructional focus on higher stages of thinking is more effective in upper-level courses. As Terenzini, Springer, Pascarella, and Nora (1995) concluded from their research, “Individual courses may not shape critical thinking ... [and] gains may be related to the inter-relatedness of courses taken.” (p. 24)

The examples above demonstrate that although instruction in lower-level classes should primarily aim at moving students from Absolutist to Multiplist thinking, additional teaching strategies can sensitize and prepare students for Evaluativist thinking in their future, upper level coursework. Another example of preparing students for Evaluativist thinking involved introducing them explicitly to critical thinking skills, but in a limited way. Only procedural thinking was introduced, in terms of rules of logic and argumentation, especially the rule of using evidence to support claims. After students were introduced to this limited approach to critical/logical thinking, they were encouraged to use the “Mission Critical” website at San Jose State University, which is an interactive tutorial based on right/wrong answers to concepts of logic and argumentation (http://www.sjsu.edu/depts/itl/). In later, upper-level courses, students’ familiarity with procedural thinking serves as a scaffold to making critical judgments among alternatives. Obviously, this is a long-term scaffolding technique that requires faculty to work together on a “learning across the curriculum” approach to curriculum organization (Adams & Hamm, 1996).

BARRIERS TO INTELLIGENCE DEVELOPMENT

Gender Influences. In her studies of gender differences in intellectual development, Magolda (1990) observed that women tend to withhold themselves from their discovery of uncertainty. Astin (1992) found that association with same-sex peers in college reinforces gender differences. During analysis of the qualitative data
for this study, a working hypothesis was developed: if women students in general tend to withhold themselves from the uncertainty that accompanies movement beyond the Multiplist stage, such withholding may be especially prominent in family science programs that have a high enrollment of female students. Data were found to confirm this hypothesis, but more extensive study should be conducted on this topic. In general, women’s preferred, relationship-oriented way of learning functioned as both a weakness and a strength for the students in this one study.

Observational data repeatedly showed that the female students in this study tended to move from Absolutist to Multiplist thinking on the basis of social harmony — showing respect for other opinions by avoiding judgments. Although this social rule allowed students still to cling to their own Absolutist beliefs, it did show movement away from the initial level of Absolutist thinking, at which all other ways of thinking are judged to be wrong. The rule of social harmony is a mixture of Absolutist and Multiplist thinking that tends to discourage development to more sophisticated levels of thinking, as a type of developmental foreclosure (Marcia, 1994). The rule of social harmony continued to plague even those students who developed a capacity for higher-order thinking. At one point in her interview, Vera demonstrated Relativist thinking when she described a class discussion on responding to children’s questions about sexuality:

Some of the students had the fear that we could be fired if we handled this in the wrong way. . . . I think that (um) how would you feel if you didn’t . . . tell children the truth? . . . I myself would answer a question honestly. (Interview, 5/11/98, p. 5)

When the interviewer commented on the clash of ethical positions, Vera said “I almost feel bad for the children who will be in those other classrooms” [where questions would not be answered honestly].” (p. 5). Later, she returned to this topic and reverted back to Multiplist thinking, showing that she adhered to the rule of social harmony:

. . . but going back to the sexuality discussion, you know I joked that I feel bad for the children in those other peoples’ classes. I don’t. I don’t. Because I do think that those teachers will offer those children something else that’s valuable. And, and I think . . . what’s valuable to me may not be valuable to you. (p. 14)

Despite this regression, Vera’s capacity for critical observation and insight enabled her to perceive both the weakness and strength of the rule of social harmony. Early in her interview she noted, “I’ve often been frustrated by . . . classes because they’ve been discussions and everybody knows everybody and you go through that whole rigmarole of, you know, everybody’s friends.” (p. 12) At a later point, she stated clearly how an all-female group could have special strength:

You need to have a comfortable class setting . . . the fact that we were all women really helped. . . . I think it’s more comfortable to talk about your emotions and to feel safe when . . . we’ve all shared experiences . . . And with men that closeness has to be searched for. (p. 14)

This discovery — of a rule of social harmony that operates frequently as a barrier to intellectual growth among women but sometimes as a strength — is supported by
Terenzini et al.'s (1995) finding that female students need validation, both academic and interpersonal, and that invalidating experiences may set back their learning.

Terenzini et al. also found that “Students who characterized their relationships with other students as competitive, uninvolved . . . [and] alienated . . . were more likely to show gains in critical thinking than were students who portrayed their peer relationships as . . . ‘friendly, supportive . . . [or with] a sense of belonging’.” (p. 35) These authors concluded that being in a supportive peer environment “. . . may require a partial suspension (or at least not the encouragement) of one’s critical (i.e., analytic) thinking skills.” (p. 35) Palincsar (1998) cites studies showing that open intellectual conflict results in more productive classroom discussion and learning. The rule of social harmony does appear to discourage open intellectual conflict and encourage suspension of critical thinking. Thus, there is some evidence that women, in particular, may collude to inhibit exploration of intellectual differences.

Further study of a rule of social harmony could benefit college teachers. Palincsar (1998) noted that, when students avoid addressing their obvious intellectual differences, teachers have a greater instructional challenge. For many college students who operate under a rule of social harmony, choosing one interpretation or decision over another tends to be perceived as a personal choice and a matter of identity. Equating personal opinion with identity seems to fit Taylor’s (1992) description of “expressive individualism” based on an ethic of authenticity that is “relatively new and peculiar to modern culture.” (p. 25) Within an ethic of authenticity, intellectual criteria are rejected as a basis for judging personal choices, and “moral particulars are not grounded in reason.” (p. 18) Therefore, when instructors attempt to use intellectual standards to evaluate thinking, the implicit social rule and underlying ethic can lead students to judge that the instructor is being “rude” or “demeaning”, by attacking an individual’s identity. If Taylor’s analysis of the contemporary ethos is valid, deflating an implicit rule of harmony may be a daunting task for instructors throughout higher education.

For the present study, the primary teaching strategy used to address the rule of harmony was to promote metacognition. In an introductory lower-level course, students were given a chart and explicit instruction about the framework of student intellectual development used in this study, as well as the expectation that earning a higher education means learning to operate at least at the level of Evaluativist thinking. As Barrowman (1996) notes, “to leave our expectations vague and only generally defined is not effective teaching.” (p. 107) Therefore, if we expect students to develop Evaluativist thinking, we should clarify what that expectation means. Students thereby acquire more responsibility for assessing their own intellectual development and for understanding the intent of teaching strategies that do not fit the expectations of their developmental stage.

Emotional/Affective Responses. Reliance on a rule of social harmony may partially explain the second barrier identified in this study: many students demonstrated difficulty with emotional or affective issues related to course content. Family science encourages understanding and acceptance of diversity in family form, human sexuality, and other issues of intimate life. This tolerance for such diversity contradicts the Absolutist perspective of some students. As a result, students may resist, withdraw, or show anger when their Absolutist values are challenged. Even if
perspectives are not challenged, there are issues in family science that touch on some students' personal histories. Classroom discussion of these issues may evoke affective responses that go beyond the discomfort of cognitive dissonance. Students' emotional reactions can interfere with information processing and thereby become a barrier to intellectual development.

To address affective issues through the cognitive domain, metacognitive strategies were again used. In one class, students read and discussed a text, *Conceptual Blockbusting* (Adams, 1988), which describes a variety of blocks to thinking, including emotional blocks. Lacy demonstrated the effectiveness of this strategy in her interview:

"I felt like I learned more a broader way of learning... I feel like it's been an experience of trying to (ah) find the... conceptual blocks that I had, you know, that I didn't even... know they were there until they were actually pointed out to me... then I was able to actually use them and... see where, what was holding me down [from learning].... Once you figure it out, at least you have the tools and the skills to actually work on it, to... grow with it and also to see it in other people and try and help them." (Interview, 12/1/97, p. 10)

**DISCUSSION AND IMPLICATIONS**

This study demonstrates the importance of conducting classroom research on teaching practices in family science. The three researchers who conducted this study all were well regarded as teachers, and they assumed that their teaching practices were effective. Their systematic investigation did identify many classroom practices that facilitated student intellectual development, but the study also revealed some practices that were not successful. These problematic practices had not been identified through the student course evaluations that are typically used to assess university teaching. The systematic, in-depth investigation, utilizing multiple observers, did reveal ineffective practices. In addition, several effective teaching and curriculum development practices were revealed, including the use of:

- inductive matching strategies to help Absolutist thinkers learn general principles;
- peer discussions and negotiations of alternative choices based on principles, to promote progress from Absolutist to Multiplist thinking;
- metacognitive strategies to promote awareness of inferencing and understanding of intellectual development (including blocks to development);
- preparation for Evaluativist thinking through exposure to procedural logic and argumentation rules; and
- a "learning across the curriculum" approach to promoting intellectual development.

Many students in this study did not reach higher levels of thinking before they graduated. This finding is not new (see Perry, 1968), but it has important implications for academic and continuing education programs in family science. Few undergraduates are able to reach the Relativistic stage of thinking, many continue to struggle within the Evaluativist stage, and some remain Absolutist or Multiplist thinkers. There is a need for more classroom-based training to teach many teaching practices that can help large numbers of students reach advanced levels of thinking. In addition, the profession of family science to become more involved in training professional families in fields of practice, because many students graduate before leaving college. The content of professional development has been shown to have a significant impact on the teaching practices of professional families. This has implications for professional development programs and training content. Professional development programs may need to focus more on helping family science professional become more involved in training family science professional families in fields of practice, because many students graduate before leaving college. The content of professional development has been shown to have a significant impact on the teaching practices of professional families. This has implications for professional development programs and training content. Professional development programs may need to focus more on helping family science professional become more involved in training professional families in fields of practice.
There is a need for more classroom research in family science to identify many teaching practices that can help larger numbers of undergraduates reach advanced levels of thinking. In addition, there is a need for academics in family science to become more involved in training post-graduates who are working with families in fields of practice, because many do not reach advanced levels of thinking before leaving college. The content of professional training should go beyond the transmission of new research findings (facts) and useful techniques. Technical, factual training will not help practicing professionals to think more critically about their work; therefore, professional development programs should be designed with scaffolds to more sophisticated reasoning.

This study also revealed two possible barriers to intellectual development that warrant further study: affective issues and a norm of social harmony. Affective issues may interfere with information processing and function as a block to intellectual development. While this study revealed the importance of developing classroom techniques to assist students with emotional blocks, little information on helpful teaching practices was produced. Further classroom research could help to identify methods of helping students to understand and resolve affective issues. A larger social barrier to development, the rule of social harmony, also should be examined by other instructor-researchers. How widespread is such a rule? Does it reflect Taylor's perspective of a modern ethic of authenticity? Is it more common among female students? Do other instructors find it to be a formidable challenge? What instructional practices diminish the influence of such a rule?

Only by making our classroom practices an object of systematic inquiry can we truly know which teaching practices best promote the intellectual development of our students. The study described here offers one approach to such inquiry; further information on classroom research will be available in another forthcoming article by the authors (Quoss, Williams, & Cooney). Family scientists in academe, who have a long history of giving attention to teaching, can make important contributions to the scholarship of teaching by engaging in classroom research.

REFERENCES


