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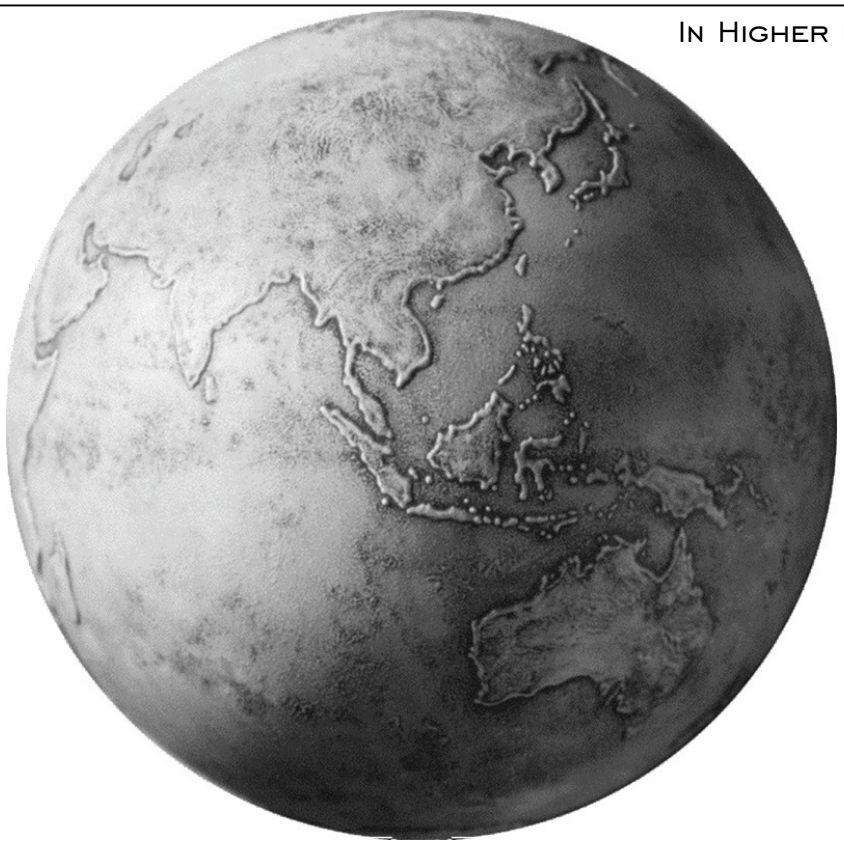

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The International Journal of Teaching and Learning in Higher Education (ISSN 1812-9129) provides a forum for the dissemination of knowledge focused on the improvement of higher education across all content areas and delivery domains. The audience of the IJTLHE includes higher education faculty, staff, administrators, researchers, and students who are interested in improving post-secondary instruction. The IJTLHE is distributed electronically to maximize its availability to diverse academic populations, both nationally and internationally.

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Research Articles

Instructional Articles

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Making Pedagogical Decisions: Reasons Female Faculty in Educational Leadership Select Instructional Methods

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A qualitative study of the pedagogical practices of the female faculty in a higher education program preparing college administrators revealed some of the reasons why female faculty choose their pedagogies. Surveys and interviews were used to determine what strategies faculty might have knowledge of and use in the classroom, as well as faculty members' experiences in professional preparation programs, and their selection of instructional pedagogies. Among the influences on choice of pedagogies were perceptions of faculty and student roles in the learning experience, promotion of student learning, role of assessment, and prior educational experiences. Findings indicated that faculty did not necessarily teach in the manner in which they were taught and that faculty valued collaborative approaches and empowerment of the student in the learning process.

Higher education is pervasively male dominated in its faculty, and consequently instructional methods tend to be those selected by men (Glazer, Bensimon, & Townsend, 1993; Hereford, 2002). A category of faculty is developing which is characterized as "new entrants" (McKenna, 2000, p. 64) who are in the 20- to 40-year age range and who have the prospects of influencing the academy as much as those faculty who came into higher education between the years of 1960 and the end of the 1980s. Women professors who now comprise 28% of senior faculty are 41% of these "new entrants" (McKenna, 2000). This new category of faculty is affecting the so-called "average" faculty member. According to McKenna (2000),

> If you're an average full-time faculty member teaching at a college or university, you're probably white, male tenured and working at the peak of your powers. You came into the profession during the boom years, when state and federal dollars were flowing into higher education and expansion was the order of the day. (p. 65)

Even with this dramatic increase of women faculty members, their role as molders and meaning-makers of the academy has been largely ignored by higher education as a field of study. With more than one third of higher education faculty now represented by women (Hereford, 2002), research should examine their pedagogies, instructional strategies, and the reasons for choosing those strategies. After all, the strategies selected may greatly influence the leaders of the next generation of academics. The focus of this paper will be on the process leading female faculty members to select a teaching pedagogy and the influences on those choices.

Differences in Male and Female Faculty Instructional Strategies

There is little argument in the literature that male and female faculty often use different instructional strategies. Grossman and Grossman (1994) listed "gender-stereotypical teaching styles" (p. 140) with the caveat that the list included generalizations. According to them,

> male faculty are more direct with their students, are more subject-centered, lecture more, and reinforce males for stereotypical male behavior. On the other hand, female faculty are more indirect, more student-centered, ask more questions, involve themselves more in classroom discussion, and negatively reinforce males for exhibiting stereotypical male behaviors.(p. 140).

However, the list does highlight differences that are supported elsewhere in the literature (McDowell, 1993; Constantinople, Cornelius, & Gray, 1988; Chamberlin & Hickey, 2001; Feldman, 1993). Earlier Constantinople, Cornelius, and Gray (1988) found similar results. They also found that female instructors were more self-assured than male instructors when presenting instructional materials and that female instructors created a classroom tone that encouraged open discussion and was less dominated by their own personal beliefs. McDowell (1993) reported that males "use the lecture method, a dominant and precise style more than females, while females feel more committed to teaching and are more informative, friendly, and open toward students…"(p. 2). One interesting finding by Chamberlin and Hickey (2001) was the difference in the ability of male and female faculty to detect

student boredom. Their research student groups evaluated female faculty as being more attuned to this classroom condition (Chamberlin & Hickey, 2001).

Some teaching strategies that are related to gender may be a consequence of classroom size. Male faculty often teach larger classes, which in turn affects the lack of participation in discussion (Constantinople, Cornelius, & Gray, 1988). Durkin (1987) attributes male faculty to be more dominant and controlling, which may result in assignment to larger classes and less classroom discussion and more lecture. The factor of classroom size, along with the gender-stereotypical styles of teaching, combine to contribute to the differences in male and female faculty instructional strategies, and several theories related to the reasons for the gender differences in selecting instructional strategies have been suggested.

Reasons for Gender Differences in Selection of Instructional Strategies

There are several reasons that have been hypothesized to impact gender difference in selection of instructional strategies. For instance, child-rearing practices may affect the differences between male and female faculty teaching. Smithson (1990) reported that "males and females are obviously raised differently in American society…most women value connections with others while most males value autonomy…" (p. 8). Also, some believe that socialization is in large part responsible for the differences in male and female instructional strategies. Specifically, males are modeled to be forceful, self-assured, and dominant in a mixed-sex group (Grossman & Grossman, 1994). Contrarily, females are socialized to be helpful, compassionate with their classmates' disappointments and problems, and less competitive than males (Grossman & Grossman, 1994). It seems likely that male and female students and faculty take these learned behaviors into the classroom with them (Smithson, 1990).

Ideals associated with feminist pedagogy may also explain the reasons for gender differences in selection of instructional strategies. The liberation model of the feminist pedagogy looks at empowerment of non-dominant groups while the gender model validates the experiences of females (Maher, 1987). These issues of empowerment and value may affect the choices that female faculty make in the classroom as they value the varied views and needs of students and act on their own strengths as females. One important dynamic of teaching is that of "positionality, or the ways in which peoples' gender, race, and class, and the shifting and dynamic relations among these and other variables, shape the construction of knowledge in each particular classroom" (Maher, 1998, p. 461).

In addition, the cultural influences on women may affect their pedagogical choices. According to Beauboeuf-Lafontant (2002), black female teachers may exhibit aspects of womanism, a perspective based on their unique legacies, and embrace maternal characteristics of caring in their classrooms. These traits of caring may affect how female faculty react to students and choose their instructional strategies.

Issues that are unique to women may also influence pedagogical decisions. Authority may be problematic for the female teacher who is trying to maintain a student-centered classroom but is still responsible for such issues as grading and meeting tenure requirements (Maher, 1990). Female faculty may deal not only with the effects of their pedagogical decisions as faculty members but the effects of their decisions as females if students question their authority or knowledge based on their gender.

The gender socialization of the students may also influence perceptions of differences in male and female choices of instructional strategies. Since much of the data regarding teaching styles is elicited from students, "part of what students view in their teachers including any differences they see between male and female teachers, they may have actually helped to encourage or to 'produce' by their own expectations and demands" (Feldman, 1993, p. 166). Issues of child-rearing practices, socialization, empowerment, value, cultural influences, and authority contribute to the selection of instructional strategies and may offer explanation for the differences seen between males and females; methods that faculty experienced as students may also contribute to their selection of instructional strategies.

Pedagogical Methods in Graduate Educational Leadership Preparation Programs

Another influence on pedagogy selection is the classroom methodologies that faculty themselves experienced as graduate students (Ball & McDiarmid, 1990, as cited in Even, 1993; Howard, 2002; Weidemann & Humphrey, 2002). Traditional instruction in educational leadership administration is very much instruction/teacher centered. According to Tanner, Galls, and Pajak (1997), the entire educational experience is scripted by the instructor. There are "learning objectives, lectures, and assignments provided by the instructor, formal class discussion, an occasional film and field trip to a school setting, tests, and papers written about the concepts identified in the instructor designed objectives" (Tanner, Galls, & Pajak, 1997, p. 4). Albanese and Mitchell (1993) add that in traditional instruction there are large-group didactic instructional sessions, prescribed laboratory experiences, and

regularly scheduled multiple-choice tests.

The instructional strategies used in the preparation of higher education faculty are important because it may influence the selection of teaching strategies of its graduates. From their classroom experiences, students construct concepts about good and bad teaching, what enhances student success, and what makes a good class (Feiman-Nemser, McDiarmid, Melnick, & Parker, 1987). During the class, students develop concepts of how teaching is done (or should not be done).

There are numerous influences on the pedagogical decisions of faculty members. Gender may play a role in strategy selection with female faculty who are more likely to encourage open discussion and male faculty who are more likely to use a dominant, lecture style. These differences may be related to socialization of the genders as women may be modeled to be more helpful and compassionate and men to be more dominant. In addition, faculty experiences with teacher-centered instruction in their own professional preparation programs may influence their pedagogical decisions. These influences play an important role in the pedagogical choices of the female (and male) faculty and possibly their effectiveness in the classroom.

Context of the Study

The female faculty members in the College of Education, which includes fields of teacher education and educational leadership, at a public, flagship university were participants in the current study. This research attempted to explore the instructional methods that the female faculty members in the educational leadership program employ and the reasons they select a particular approach.

This southeastern research university's faculty makeup is similar to other universities, but not as large. Nationally, in August, 2005, the percentage of full-time higher education female faculty members was 39% (The Chronicle of Higher Education Almanac, 2005-6, p. 26). According to the Executive Director of the Office of Institutional Research and Assessment at the institution studied, among the entire fulltime faculty, women faculty currently represent approximately 36% of the faculty (Executive Director, personal communication, October 9, 2005).

However, the percentage of female faculty members is not uniformly distributed across the different colleges and departments. In the institution studied, we found a much higher concentration of female faculty members in the College of Education, where 51% of the fulltime faculty members were female. In educational leadership (the area of the researchers' interest), 63% of the faculty members were female, a much higher percentage than both the national average and the institution average. This higher percentage of female faculty members in this College of Education is supported by the research that female faculty members are consistently found in just a few academic fields such as nursing, foreign languages, library science, and education, and not evenly distributed across disciplines or colleges (Bradburn & Sikora, 2002; Glazer, Bensimon, & Townsend, 1993; Moore & Sagaria, 1993).

Methodology

The researchers used a basic qualitative design to frame their research methods (Creswell, 1994). Faculty members were asked background questions through an advance survey, but the research relied heavily on one-to-one semi-structured interviews (Merriam, 1998). Interviews were transcribed verbatim. Standard qualitative techniques, such as constant comparison (Merriam, 1998; Creswell, 1998) and inductive analysis for data evaluation, were used.

The sample for this study was a total population sample and involved a single-stage sampling procedure (Creswell, 1994). Of the nine female faculty in the department studied, seven were interviewed. One faculty member was on sabbatical and could not be reached, and one declined to be interviewed.

Researchers developed a survey (see Appendix A) that collected demographic data from the faculty. Included were questions regarding number of years in teaching and administration, and the number of pedagogy courses taken. The survey included a list of possible instructional strategies that the faculty might have knowledge of and consequently use in the classroom, including discussion, technology, cooperative learning, lecture, feminist, collaborative learning, and an open-ended blank for "others." In the one-to-one interviews, faculty were asked questions regarding their experiences in their professional preparation programs, their instructional pedagogy, influences on the selection of this strategy, their beliefs regarding the role of students and instructor in this strategy, and other questions related to classroom interaction (see Appendix B)

The demographic data reported by the seven faculty members interviewed showed an average of just over five and a half years (M =5.57) years graduate teaching experience, with a high of twelve and a low of two. Average time spent teaching at the research institute studied was over two years (M =2.1), with a high of three and one with with a low of one year. One faculty member was tenured. Five others were tenure track and one was a contract faculty member. The group had extensive experience at all levels of teaching and educational administration. The average number of years working in an educational environment was over 16 years (M=16.5). (This data was skewed because two

faculty members had each spent more than 30 years in teaching and administration at all levels.) If the median is reported (Mdn=11), the data are better represented.

Other information reported from the survey data included that the faculty had experiences in teaching and administration in elementary, middle, undergraduate, and graduate level activities. Curiously, none indicated experience in secondary teaching or administration. Degrees obtained by the subjects included five PhDs and two EdDs.

Of course, the entire sample studied was female and the majority of the group, (five professors), were in the 35 to 44 year old age range, followed by two who were in the 45 to 54 year old age range, and one who was between 55 and 64 years of age. Only three professors, out of the seven female faculty members interviewed, had participated in formal coursework in pedagogy.

Findings

Several themes emerged from the data analysis. Particularly dominant themes included female faculty members' perceptions (a) of the role of faculty in the classroom, (b) of the role of students in the classroom, (c) of the best ways to help students learn, (d) of the influence of assessment in selecting a strategy, and (e) of the effect of female faculty members' prior experiences and professional preparation on the selection of an instructional strategy.

Perceptions of Faculty Role

Each of the female faculty members interviewed was a promoter of the empowerment of students, with the focus on the student's participation in his or her learning. Overwhelmingly, faculty members reported that their role in the classroom was to facilitate or act as a resource for classroom learning. This facilitation often involved encouraging students to question the faculty member's beliefs and opinions and to embrace their own truth and reality.

Another perceived part of the faculty member's role was seizing a teachable moment. Faculty members were concerned about preparing students to learn and therefore capitalized on any event to learn. Faculty felt that most opportunities could be turned into teaching and learning opportunities.

Choosing the appropriate instructional method was also viewed as part of the faculty member's role; situational influences were not overlooked as guideposts for teaching strategies. Faculty recognized that all instructional methods have merit and the choice of which methods to use should be based on the course, class size, the number of sites to which instruction is delivered, and other related factors. The choice of the instructional methods also depended on the needs of students, and faculty recognized this as part of their role. When faculty realized that students did not comprehend information, they chose new approaches to teaching, constantly evaluating and adjusting the strategies until the students' needs were met.

Planning and preparation were viewed as key roles of the faculty members. Faculty saw themselves as designers of the learning environment, suggesting that faculty allow adequate planning time prior to delivery or facilitating. They experienced anticipation and enthusiasm during their planning for the class meeting and looked forward to learning along with the students. Faculty did allow flexibility in planning for the class, developing strategies as the class progressed and allowing more flexibility for graduate students. Clearly, faculty must plan the learning that should take place during the class. However, female faculty are often more open to different paths that learning make take that have not been entirely planned by the faculty member.

Perceptions of the Role of Students

Self-reliance and responsibility for learning were among the roles the faculty members saw for students in their classrooms. Faculty expected students to take part in the learning process, sharing the responsibility for learning with the faculty member and playing a role in their classmates' learning as well. Students were seen as responsible for constructing their own knowledge, adding the course content to what they already knew and in some cases sharing that new knowledge with classmates. Students were expected to develop accountability and problem solving skills rather than relying on the faculty member to tell them everything they should know. Faculty felt that students should be engaged with the course, growing and developing in the classroom in different ways, and that students should take themselves seriously, possibly even elevated to the status of colleague. These responsibilities were not without problems, especially with regard to the students' willingness to join in classroom discussions, possibly due to cultural expectations. Faculty believed that some students find it difficult to be engaged in order to take ownership of the information and concepts because they have been socialized to revere the instructor as the expert.

Other roles for students were identified as well. Writing was an important role for students as reported by faculty, with requirements for the student to know the subject matter but also to obtain the skills and tools needed for teaching and research. Students may also have other responsibilities including evaluating instruction and influencing the faculty member's future courses.

Promotion of Student Learning

Faculty members recognized their roles in enhancing student learning through choosing appropriate strategies. They attributed increased learning to classroom discussion because of the exposure to perspectives that are new and completely different. In addition, relevance was an issue in selecting the best instructional strategies, emphasizing the need for problem-solving skills in order to solve problems encountered outside the classroom. But, faculty indicated that class size was a contributor to student learning with the majority preferring small class sizes to allow students to feel comfortable with each other and to communicate in the classroom. Small class size was preferable for all delivery modes, including on-line.

The Role of Assessment

The role of assessment in the choice of methodology varied among the faculty members but was not the driving force in the selection of their primary instructional methodology. Faculty referred to using more formal assessment methods with undergraduates but less structured assessment methods with graduate students. Graduate students were still asked to demonstrate their knowledge in a variety of ways such as discussion, compressed video conferencing, and face-to-face instruction.

Prior Experiences and Training

When asked about the primary method they were exposed to, many faculty indicated that lecture was the primary method. Faculty were exposed to a variety of strategies including case studies, lecture, team approach, collaborative learning, service activity, and small and whole group discussion.

The effect of these earlier instructional strategies and their influences on why faculty chose a particular teaching method were varied. Faculty did not necessarily teach in the manner in which they were taught. Much of the research literature on faculty teaching is based on men, which may not correctly reflect female faculty teaching. As a whole, the faculty members interviewed were proponents of collaborative approaches, student-centered learning, and valuing the knowledge and experience of their students. Several described their relationship with students as being co-colleagues, searching together for knowledge. The majority of the participants (seven) mentioned using informal lecture to a small degree either to provide background for a topic or to set the stage for a project or discussion. None of the professors interviewed used lecture as a primary delivery method. Faculty tried to replicate the instructional pedagogy of classes that they felt benefited them the most, whether the classes were in graduate school or early school experiences.

Other experiences also had an influence. Earlier careers, such as working with a certain group of students, influenced pedagogy selection. External influences such as peer discussion and trends in literature also influenced their teaching methods.

Additional information collected via the survey and interviews revealed the following. Technology knowledge and use drew the sharp lines of division among the faculty. Although five of the seven surveyed included technology as an instructional strategy of which they had knowledge, only four mentioned implementing technology into her classroom activities. Two faculty members used technology extensively in their delivery method while another two only mentioned technology negatively, referring to its susceptibility to mechanical failure. The two professors who were self-declared feminists did not use technology at all. The two professors who labeled themselves constructivists consistently used technology for instruction.

The faculty were unanimous in their agreement on some aspects of classroom pedagogy. All faculty responses supported the use of collaborative learning and empowerment of the student. All seven respondents have some aspect of feminist pedagogy whether or not they use it as a primary instructional method. (Feminist pedagogy is a student-centered pedagogy that allows students to actively participate in their own learning. Students and faculty work cooperatively on developing the learning outcomes for the course. Students also work cooperatively to gain knowledge by participating in groups and discussing to learn more about the subject (Feminist Pedagogy, 2005).

It is interesting to note that only two of the professors, named their pedagogical style. Two of the seven professed to be feminist while the other five used a combination of pedagogical strategies. Six of the seven professed to be chameleons, their pedagogical color being guided by the situation and the student.

Discussion

Faculty who refuse to lecture refute some of the findings in the literature. According to a review of the literature conducted by the researchers, many faculty members tend to adopt the instructional strategy that they experience in their own professional preparation [Flood & Moll, 1990; Ball & McDiarmid, 1990 as cited in Even (1993)]. Additionally, Lucas (1989, as cited in Travis, 1995) also reported that the instructional methodology that faculty choose is similar to the instructional strategy they (the faculty) have experienced. According to Travis (1995), this influence

may result in regrettable selection of instructional styles.

Female faculty members reported that they feel that students have a responsibility to participate in their own learning, such as taking part in discussion, questioning, researching and writing, developing critical thinking and problem-solving skills, and, in some cases, determining the classroom pedagogy. Chilwniak (1997) found that "women faculty are more likely to provide participatory environments" (p. 16). According to Lowman (1984), students in female faculty classrooms interact more and without prompting than in male faculty classroom and are more likely to interact with their female faculty as "full partners in the learning process" (p. 135).

Elevating students to co-colleague in the female faculty's classroom is not without problems. When a course first ensues, there are formal roles that need to be hashed out and established. This may be problematic because students have been socialized to revere the instructor as the expert. According to Maher (1993), "habits of inferiority and passivity of looking to the teacher for the answer have to be deliberately challenged to be broken" (p. 573). Brookfield (1998) found that because of the entrenched hierarchical culture of higher education, faculty cannot dismiss the students' perception of faculty as being superior. After thoughtful attention to how students perceive them and their interpretation of what teachers say and do will they come to comprehend that "authentic collaboration can happen only after they have spent considerable time earning students' trust by acting democratically and respectfully toward them" (p. 532). Regardless of how much instructors want to be a co-teacher or co-learner, "culturally learned habits of reliance on, or hostility toward authority figures (especially those from the dominant culture) cannot so easily be broken" (Brookfield, 1998, p. 531). A learning environment can emerge that transforms the instructor into the learner and the learner into the student. The instructor must then take the responsibility to encourage students to find and develop this relationship (Turner, 2001). According to Bridges and Hallinger (1992), professors who believe that their teaching is the same as their students' learning and who have attachments to the methods used to instruct them (the professors), will have much difficulty in changing the traditional role of student and teacher.

Some faculty may not use discussion in the classroom. There may be various reasons for not using discussion but according to Almasi, O'Flahave, and Arya (2001), research has found that some instructors do not want to use discussion as an instructional strategy because they have to surrender some control within the classroom setting. In a traditional classroom setting, "the instructor expert is seen as possessing superior knowledge and wisdom…" (Bosworth, 1994, p. 25). One area of inquiry has investigated the effects of lecturing versus discussion and found practically no evidence that lecture (the most commonly use instructional strategy in male dominated higher education) is just as efficient in delivering subject matter content to students as is discussion (Pascarella & Terenzini, 1998). However, the drawback comes when the instructional objective is to develop critical thinking and problem solving skills rather than the communication of factual information. Discussion wins under those circumstances (Pascarella & Terenzini, 1998).

Statham, Richardson, and Cook (1991) also published results regarding how gender affects university teaching. They found that female professors tend to see students as a valuable source for learning, not only for the other students but also for the faculty member. According to the interviews they conducted, they found that female professors were more apt to view their students as an important component to have a say in what goes in the classroom. The same researchers reported that the instructional strategies used by female faculty were more student-centered than instructor-centered and experiential. Female faculty "often said that they used experiential teaching methods in which they encouraged students to learn by doing and by experiencing the subject matter" (Statham, Richardson, & Cook, 1991, p.55).

For some, job satisfaction for female faculty is closely correlated to their ability to create teaching and learning relationships with their students. "Women faculty seem to take their relationships with their students very seriously" (Ropers-Hullman, 2000, p. 24). An axiom of gender study is that females (faculty and students, alike) identify more with relationships to others than with separation. The opposite is true for males (Smithson, 1990).

Traditionally, university education has been fed by competition and separation. Competition and separation are promoted among students, "separating 'A' students from 'C' students and offering professors who often dispense knowledge from their position of authority and power instead of facilitating learning" (Smithson, 1990, p. 16). This position is characteristic of a masculine instructional strategy in higher education. Fortunately for the students of the faculty studied in this research, this appears not to be true. Rather, student knowledge and experience is valued and recognized in the classroom.

Recommendations for Future Research

Part of the mission statement of the College of Education at the institution studied supports the development of professional educators to be successful

decision makers who aid, and not impede, student learning, and to promote lifelong learning among the educators. Constructivism is also endorsed as the instructional strategy of choice. The female faculty members at this institution generally adhere to that philosophy. However, some report using only one instructional approach, which may not address all of the learning styles in a classroom, e.g., the two self-proclaimed feminists and those who do not use technology in their classrooms.

The women faculty members at this institution mirror much of the research literature findings. They are supportive of students and value their input. They promote interaction within the classroom and invite questioning. The faculty viewed themselves as facilitators of learning, not the fountainhead of knowledge. The faculty members were aware of their pedagogies and acknowledged the need for flexibility in some cases. They also recognized that choosing an instructional strategy is critical to the learning that takes place in the classroom and is a very important player in the hidden curriculum. Often the students learn as much from the strategy as they do from the information presented.

The interview process employed in this study created an increased awareness of the pedagogical/instructional preferences of female faculty in the College of Education and the dynamics that exist within the classroom. The college's mission is to offer exemplary professional programs, which prepare educators to be effective decision makers who facilitate student learning, and its goal is to prepare professionals as reflective practitioners and ethical decision makers. Based on the findings of this study of female faculty pedagogical/instructional preferences, the following recommendations are proposed:

1. A study should be conducted to determine the feasibility of including alternative pedagogical methods in the college's mission and vision.
2. To enhance the reflective process, the female faculty interviewed should be provided results of the study in order that each may reflect on the types of instruction she provides.
3. A study should be conducted to provide data on the instructional pedagogies of the male faculty in the higher education in general, and the institution studied in particular.
4. A study should be conducted to provide data on the instructional pedagogies of male and female faculty at smaller private institutions.
5. Faculty who have been at an institution for a longer period of time should be examined for their position on instructional strategies.
6. College curricula should be reviewed to determine if pedagogy is included in the course series, especially in graduate instructional leadership programs.
7. Regional differences in instructional strategies in higher education should be examined.

Several suggestions for this faculty have resulted from the research. Noting the lack of course work in pedagogy experienced by the female faculty, perhaps this might be an area of faculty development through workshops, observation, or research. Peer observations might also be helpful. Teaching is primarily a profession that is conducted in isolation (Sadker & Sadker, 1990). A review with an eye toward rewriting/restructuring student evaluation forms to gather more in-depth information could provide the data needed for instructional changes.

Another recommendation would be to team faculty with different pedagogical approaches to teach together where both could learn from each other.

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Appendix A

Demographic Survey

Research indicates that college faculty frequently teaches in the same manner they were taught. If a graduate student is primarily taught with a specific instructional strategy (such as lecture), then that student will be more likely to use that particular method in their own instructional efforts. We are interested in determining attitudes, philosophies, and experiences of female professors concerning their teaching methodologies in graduate education and what influences their selection of a particular pedagogy. Our population will include all female professors within the Educational Leadership, Policy, and Technology Studies area. Our two main questions will focus on:

1. What instructional pedagogy does this flagship research institution Higher Education female faculty members use in the classrooms?
2. Why do female faculty members choose that particular method?

Demographics:

How many years have you taught at the graduate level? _____

How many years have you taught at this institution? _____

Are you: (Please circle one)
Tenured
Tenure track
Other

How many years have you worked in any educational environment? _____

What educational areas have you worked in? (Please circle teaching, administration or both next to the area worked).

Elementary	teaching	administration	both
Middle	teaching	administration	both
Secondary	teaching	administration	both
Undergraduate	teaching	administration	both
Graduate	teaching	administration	both
Professional	teaching	administration	both

Highest degree earned _____

Institution where terminal degree was completed: _____

Have you ever completed a course in pedagogical theory? _____

Age
25 - 34
35 - 44
45 - 54
55 - 64
65 and above

Of what instructional strategies do you have knowledge? Check all that are appropriate.

_____Discussion	_____Technology	
_____Cooperative Learning	_____Lecture	
_____Collaborative Learning	_____Feminist	_____Other (please indicate)

Appendix B

Pedagogy Survey

Research Title: The Pedagogies of Female Faculty in Educational Leadership, Policy, and Technology Studies

Researchers:

Interview Protocol:

Interviewee:

Interviewer:

Time:

1. Describe your teaching philosophy.

2. What primary teaching methods were you exposed to during your graduate studies?

3. What other exposures to teaching methods have you had, e.g., undergraduate work, professor/school teacher parents, coursework, professional experiences?

4. Which of these were the most influential in affect the way you teach?

5. What is your primary instructional pedagogy?

6. What is your reasoning for relying on this method more often than other methods of teaching?

7. Why did you choose this primary method of instruction?

8. What is the role of the student in your preferred instructional methodology?

9. What is the role of the instructor in your preferred instructional methodology?

10. What influence (if any) did the means of assessment contribute to your decision to use this particular method?

11. What might be other factors that affect the choice of a particular pedagogy?

12. Does class size affect your choice of methods? How or why?

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Problem Solving Abilities of Malaysian University Students

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Problem solving abilities of college graduates have received considerable attention among employers, university professors and the public at large. Problem solving is a generic skill that needs to be acquired in ensuring success in learning and in the workplace. This study focuses on problem solving abilities of Malaysian university students from the faculties of Engineering, Science, Computer Science, Medicine, Management and Law. A total of 3025 respondents participated in this study. Samples were chosen from seven public universities and two private universities. Data were collected using the Problem Solving Skills Scale (PSSS) component of the Social Problem Solving Inventory (SPSI). The SPSI consists of two major scales, Problem Orientation Scale (POS) and Problem Solving Skills Scale (PSSS). The purpose of this study was to describe the overall problem solving abilities of Malaysian university students, with comparisons made based on year of study and fields of study. There were significant difference between problem solving abilities of (a) final year and first year students, and (b) students from different fields of study.

Problem solving abilities of college graduates have received considerable concern among employers, university professors and the public at large. In Malaysia, the importance of this skill is documented in *Quality Assurance in Public Universities of Malaysia: Code of Practice* (Quality Assurance Division, 2004) that states that the quality of university programs is assessed by the ability of its graduates to carry out their expected roles and responsibilities in society. Among the competencies that students should demonstrate at the end of the program, as stated in the document, are critical thinking, problem solving, creative decision making, ability to communicate, apart from mastery of knowledge in specific fields. Similarly, the United States Department of Labor (1991) also emphasized the importance of developing students' problem solving abilities. The emphasis on problem solving has resulted in efforts to enhance the capabilities of students to solve problems, which include most disciplines and most educational levels (Kulm, 1990; Thomas & Englund, 1990).

The demands of a changing workplace and a complex global society have raised expectations regarding thinking and problem solving among students. College graduates are expected to be able to think critically, take initiatives and responsibilities, devise goals and strategies, and solve problems. Hoenig (2000) cited that a recent survey of 1,000 executives by Caliper Associates, as reported in *The Wall Street Journal*, showed that problem-solving ability is now the most sought-after trait in up-and-coming executives. He further stated that career potential is limited if the individual is not a problem solver.

According to O'Leary (1995), the Business/Higher Education Round Table (B/HERT; 1991) has been pivotal in producing findings relating to both employer requirements and graduate performance in the workforce. O'Leary added that the majority of B/HERT's and related studies (Bradshaw, 1985; Candy & Crebert, 1991; Cooper's & Lybrand, 1991) have found that stakeholder consensus regarding desirable graduate characteristics is fairly consistent. Generic skills such as communication skills, capacity to learn new skills and procedures, decision making and problem solving skills are consistently ranked highly in desirable principal outcomes of undergraduate education. The capacity to solve problem is consistently identified as one of the top three most desirable characteristics of college graduates. Comparable findings were reported by the human resources agency Coopers and Lybrand (1991) when a survey of employers from Queensland business and industry sectors was conducted (O'Leary, 1995). From the perspectives of students, problem solving is also perceived as one of the most valuable skills that they expect to acquire during their university years. In a study conducted at Boise State University (Belcheir, 1996) on what students valued from college education and the extent to which the university have helped them to grow in these areas, the top three skills ranked as most valued by college graduates were written communication skills, oral communication skills, and problem solving skills. The arts, science and business students ranked problem solving as one of the top three, but ordered them slightly differently. The education students ranked it fourth, selecting life long learning as the most important followed by the two communication skills.

Despite the focus on problem solving skill at all levels of education and especially at the university level, research studies (Nickerson, 1994; Kessel, 1996a, 1996b, 1997; Woods et al, 1997) have shown that

university students are not acquiring the skill. Nickerson (1994) stated that educators, researchers, and the business community have long lamented that students are not learning the high level thinking and problem solving skills needed to confront our rapidly changing world and the problems facing society as a whole. This is supported by Woods et al. (1997), in which they found that there was no improvement in problem solving skills among the engineering students during the four-year undergraduate program despite the dedication and efforts of their professors. They further stated that graduating students showed the same inabilities that they had when they started the program. Similar to Woods' findings, Kessell (1996a; 1996b) also found that many undergraduate science and engineering degrees are so packed with facts, technical details and "advanced widget-making" that they do not address adequately such basic issues as creative thinking and problem-solving. Kessell (1997) also noted that students' lack of basic problem solving skills is a frequent complaint heard from teachers, lecturers and especially employers.

Gender differences in problem solving skills have also created interest among researchers. Research with adults indicates that there are gender differences in the skills that men and women use in problem solving (d'Estree & Babbitt, 1998). In a study on Chemistry problem solving, Adigwe (1992) identified higher problem solving achievement among males than among females. However, D'Zurilla, Nezu, and Maydeu-Olivares (1998), in their study on gender differences in problem solving, did not find a main effect for the role of gender as a moderator of social problem solving. The findings pertaining to gender difference in problem solving skills seem inconclusive. Rich and Bonner (2004) stated that no definitive conclusion about gender differences in social problem solving could be made as yet.

Problem solving skill has created interest in researchers and its study has been viewed based on many different theoretical frameworks (Bransford & Stein, 1984; D'Zurilla & Nezu, 2001; Wu, Chester & Dyrenfurth, 1996). Among the different aspects studied are personal problem solving, technological problem solving, and social problem solving. Although ability in problem solving in one's own field of specialization remains the most important characteristic of graduates (Coopers & Lybrand, 1991; Quality Assurance Division, 2004), certain desirable characteristics will be the discriminating factor among college graduates that are applying for a particular position. Employer survey conducted by the University of California, Berkeley (Stasz & Brewer, 2005) suggested that employers are often more concerned about soft skills or attitudes rather than technical knowledge or competencies. Similarly, in Stasz, Ramsey, Eden, Melamid, and Kaganoff (1996) empirical studies of work, it was found that employers and workers feel generic skills, such as problem solving, communication, and the ability to work in teams, are increasingly important for workplace success. These studies have clearly shown the importance of social problem solving, which involves a process by which a person attempts to develop effective or adaptive coping responses to problematic situations. This process includes several cognitive components, such as problem evaluation, seeking response alternatives, and planning (D'Zurilla, Nezu, & Maydeu-Olivares, 1998).

Social Problem Solving

Ritz, et al. (1986) simply defined a problem as a need which must be met. According to Martinez (2005), problem solving is the process of moving towards a goal when the path to that goal is uncertain. The definition is similar to that of Charness (1998), who stated that problem solving is the activity that enables someone to attain a desired state from an initial one in which it is not immediately clear how to reach the desired state. On the other hand, D'Zurilla and Nezu (2001, p. 212) defined problem solving as "the self-directed cognitive-behavioural process by which a person attempts to identify or discover effective and adaptive solutions for specific problems encountered in everyday living." Their definition of problem solving complements their definition of a problem. D'Zurilla, Nezu and Maydeu-Olivares (2004, p. 12) defined a problem as any "life situation or task that demands a response for adaptive functioning but no effective response is immediately apparent or available to person or people confronted with the situation because of the presence of one or more obstacle." Their work focuses on the aspect of problem solving that influences one's adaptive functioning in the real life social environment (D'Zurilla, Nezu, & Maydeu-Olivares, 2004). D'Zurilla and Nezu (1982) refer to the term *social problem solving* as the process of problem solving as it occurs in the the natural environment or real world. Thus the study of social problem solving deals with all types of problems that might affect a person's functioning, including impersonal problems; personal and intrapersonal problems; and interpersonal, community and societal problem (D'Zurilla, Nezu & Maydeu-Olivares, 2004).

Within cognitive social learning theory, effective problem solving is regarded as a skill. Social problem-solving abilities encompass the attitudes and beliefs a person has about problems in general, and the specific problem-solving styles by which a person strategically or ineffectively has to solve problems in everyday life (D'Zurilla, Nezu, & Maydeu-Olivares, 2002; Heppner, Witty, & Dixon, 2004).

This paper discusses problem solving abilities of Malaysian university students. Educational reforms have increasingly focused on critical thinking processes including problem solving (Curriculum Development Center, 2002; Quality Assurance Division, 2004). The latest reform is in response to Malaysia's Vision that by 2020 Malaysia will be a developed country in an era of economic globalization. Identification of problem solving abilities of Malaysian university students who would be the leaders in 2020, is necessary. These students are the product of the educational reforms that have been emplaced. Information on the level of problem solving abilities of students upon admission into a university would be helpful as an indicator of the success of reforms made on the school curricula. Does undergoing the university three-year or four-year curricula develop students into better problem solvers to prepare them to be future leaders? Thus, knowledge on the problem solving abilities of prospective graduates of each university and academic programs would be useful for the university to improve the curricula offered by each university.

Objectives of Study

The objectives of the study were:

1. To identify the problem solving abilities of Malaysian university students; and
2. To determine the problem solving abilities using PSSS subscales based on gender, year of study, and fields of study.

Methodology

This study employs a survey methodology. It was aimed at describing the overall problem solving abilities of Malaysian university students, with comparisons made based on gender, year of study, and fields of study. A total of 3025 respondents from seven public Malaysian universities and two private Malaysian universities participated in the study. The choice of universities was based on the areas of studies offered (i.e., Engineering, Science, Computer Science, Medicine, Management and Law). For each university, certain areas of studies were chosen. For each program involved, faculties were informed of the respondents needed for the study – an equal distribution of students from first year to final year. Fifty respondents were targeted for each subgroup from each university. However, the number of respondents targeted was not met since enrollment in certain programs was much less than 50. Table 1 shows the distribution of respondents by universities.

TABLE 1
Distribution of Respondents by University

University	n
Universiti Putra Malaysia (UPM)	723
Universiti Sains Malaysia (USM)	219
Universiti Teknologi Malaysia(UTM)	179
Universiti Utara Malaysia (UUM)	402
Universiti Kebangsaan Malaysia (UKM)	405
University of Malaya (UM)	209
Universiti Malaysia Sarawak (UMS)	364
Multimedia University (MMU)	248
Universiti Teknologi Petronas (UTP)	276
Total	3025

Instruments

Data were collected using a section of D'Zurilla and Nezu's (1992) Social Problem Solving Inventory (SPSI), described by the authors as a multidimensional measure based on a perspective model of problem solving that characterizes social problem solving as complex, cognitive-affective-behavioral process that consist of different components, including general motivational variables. The SPSI consists of two major scales, a 30 item Problem Orientation Scale (POS) and a 40 item Problem Solving Skills Scale (PSSS), and seven subscales, each with 10 items. Subsumed under POS are the cognition subscale (CS), the emotional subscale (ES) and behavior subscale (BS). Subsumed under PSSS are problem definition and formulation subscale (PDFS), the generation of alternatives subscale (GASS), the decision making subscale (DMS), and the solution implementation and verification subscale (SIVS). The seven subscale structure of the SPSI was formulated based on theory (Sadowski, Moore & Kelley, 1994). Although the social problem solving inventory has been mainly conducted on respondents with negative affective conditions, such as depression, anxiety, stress, suicidal ideation and behavior (Nezu, Wilkins, & Nezu, 2004), the researchers of this study decided that the items of the PSSS can also reflect behavior with regard to university students' problem solving abilities. Therefore, based on the objectives of the study, only the 40 items of the PSSS were administered to the respondents.

The meaning and a sample item of each subscale are demonstrated in Table 2.

The PSSS requires respondents to respond to a 5-point Likert scale from *Not at all true of me* (1) to *Extremely true of me* (5). A pilot test was administered to 56 UPM students. The reliability was found to be high (r = .887). D'Zurilla and Nezu (1992) noted that the SPSI has excellent internal consistency, with alphas of .94 for the POS and SPSI and .92 for the PSSS. The

TABLE 2
Meanings and Examples from the Problem Solving Skills Scale Subscales

PDFS	*Problem Definition And Formulation Scale* refers to the ability to understand the nature of problems, identify obstacles to goals, delineate realistic objectives, and perceive cause-effect relationships. Sample Item: When I have a problem to solve, one of the things I do is analyze the situation and try to identify what obstacles are keeping me from getting what I want.
GASS	*Generation of Alternatives Scale* refers to the ability to brainstorm multiple solution ideas. Sample Item: When I am attempting to find a solution to a problem, I usually try to think of as many different ways to approach the problem as possible.
DMS	*Decision Making Scale* refers to the ability to identify potential consequences, predict the likelihood of such consequences, and conduct a cost-benefit analysis of the desirability of these outcomes. Sample Item: When I am attempting to decide what the best solution to a problem is, I usually try to weigh the consequences of each solution alternative and compare them against each other.
SIVS	*Solution Implementation And Verification Scale* refers to the ability to carry out a solution plan optimally, monitor its effects, troubleshoot if the solution is not effective, and self-reinforce if outcome is satisfactory. Sample Item: After carrying out a solution to a problem, I usually try to analyze what went right and what went wrong.

SPSI also has very good stability, with three-week test-retest correlations of .87 for the SPSI as a whole and .83 and .88 for the POS and PSSS, respectively. The SPSI also has excellent concurrent validity, with significant correlations between the SPSI as a whole and its two major subscales with two other problem-solving measures. The SPSI also has very good construct validity, correlating in predicted ways with several other measures.

Data Analysis

The data analysis included descriptive statistics, a t-test and an ANOVA. The t-test was used to compare students' scores in the problem solving inventory based on gender, while the ANOVA was used to test whether significant differences existed in the problem solving inventory scores between students in different years of study and fields of study.

Findings

In this section, findings of the study are discussed based on the objectives of the study: (a) the problem solving abilities of Malaysian university students and (b) the problem solving abilities in PSSS subscales based on gender, year of study and fields of study.

The Problem Solving Abilities of Malaysian University Students

Respondents' overall scores on the PSSS were used to describe their problem solving abilities. Overall scores were not included if respondents failed to complete all items. Results showed that on a scale of 1 to 5, the mean PSSS scores of each group by universities ranges from 3.32 (SD = .40) to 3.49 (SD = .41; see Table 3). This indicates that problem solving abilities of Malaysian universities students are positive

TABLE 3
Problem Solving Abilities Based on Universities

University	n	Mean	Std. Deviation
UPM	672	3.49	.41
USM	206	3.41	.40
UTM	159	3.41	.42
UNIMAS	343	3.45	.39
UUM	371	3.40	.39
UKM	378	3.38	.41
UM	194	3.42	.42
MMU	208	3.32	.40
UTP	196	3.46	.39
Total	2727	3.43	.41

TABLE 4
T-Test of Scores in PSSS Subscale Based on Gender

Subscale	Gender	N	Mean	SD	t	df	Sig.
PDFS	Male	946	3.60	.57	3.51	2852	.000
	Female	1908	3.52	.54			
DMS	Male	945	3.44	.43	1.03	2840	.304
	Female	1897	3.42	.41			
GASS	Male	942	3.42	.48	3.93	2846	.000
	Female	1906	3.35	.42			
SIVS	Male	947	3.37	.46	.36	2864	.719
	Female	1919	3.36	.46			

and moderate. This is based on the general rule provided by Kubiszyn and Borich (1996) who state that the cut-off point of the mean rating is 3.0 and that scores higher that 3.0 is regarded as positive whilst the contrary is regarded as negative. In addition, according to Nugent, Sieppert, and Hudson (2001) these scores can be conceived as reflecting a magnitude continuum. Higher scores are indicative of greater magnitude and lower scores indicative of lower magnitude. In this study, scores ranging from 3.00 to 4.00 indicated a moderate level of problem solving ability, whilst scores 4.00 to 5.00 indicated high problem solving ability.

Problem Solving Abilities in PSSS Subscales Based On Gender

For each of the PSSS subscales, the score is calculated only if the student responds to all the items in the subscale. Among the four subscales, at most 947 male students and 1919 female students responded to all the items (Table 4). The t-test shows that there is a significant difference ($t = 3.03$, $p < .01$) between the abilities in problem solving of male students ($M = 3.46$, $SD = .42$) as compared to female students ($M = 3.41$, $SD = .40$).

The problem solving ability in PDFS and GASS is significantly different between male and female respondents (see Table 4), indicating that male respondents were better in defining and formulation of problems and in generating alternatives in problem solving, as compared to the female respondents. However, no significant difference was found in DMS and SIVS, indicating that the male and female respondents were equally competent in making decision and in implementing and verifying the solution.

Problem Solving Abilities in PSSS Subscales Based On Year of Study

Respondents were categorized as first year, intermediate, and final year. Based on this categorization, it was found that the final year students obtained the highest score in overall problem solving ability and first year students obtained the lowest (see Table 5).

TABLE 5
Problem Solving Abilities Based on Year of Study

Year	n	Mean	Std. Deviation
First Year	1432	3.40	.41
Intermediate	469	3.42	.41
Final Year	826	3.47	.40
Total	2727	3.43	.41

A one-way ANOVA on respondents' problem solving abilities based on year of study showed that there was a significant difference, $F(2, 2724) = 6.88$, $p < .01$, between the abilities of the three groups of students. Scheffe's test revealed that the ability of final year students was significantly greater than that of first year students. However, no significant difference was found between final year students' ability with that of the intermediate group, nor between the first year and the intermediate. Table 6 shows the PSSS subscale scores based on year of study. Final year students obtained higher scores in all four subscales, PDFS, DMS, GASS and SIVS.

TABLE 6
Problem Solving Abilities in PSSS Subscales Based on Year of Study

PSSS Subscale	Year of Study	n	Mean	Std. Deviation
PDFS	First Year	1487	3.51	.55
	Intermediate	500	3.53	.56
	Final Year	867	3.60	.55
	Total	2854	3.54	.55
DMS	First Year	1489	3.41	.42
	Intermediate	497	3.41	.41
	Final Year	857	3.47	.42
	Total	2843	3.43	.42
GASS	First Year	1485	3.35	.45
	Intermediate	494	3.37	.45
	Final Year	869	3.42	.43
	Total	2848	3.37	.44
SIVS	First Year	1494	3.35	.46
	Intermediate	501	3.35	.46
	Final Year	871	3.40	.46
	Total	2866	3.37	.46

Table 7 shows the ANOVA results of subscale scores based on year of study. There is significant difference in the scores of all four subscales between respondents in different year of study. This shows that final year students are more skilled in defining and formulating problem, in generating alternatives in solving problem, in making decision required during problem solving, and in implementing and verifying the solution to problems, as compared to the first year or the intermediate year students.

Problem Solving Abilities in PSSS Subscales Based On Field of Study

Problem solving abilities were also analyzed based on the respondents' field of study. The field of study is categorized as technical (e.g. engineering, computer science), medical, managerial (e.g. business, accounting), constitutional (e.g., law), and scientific (e.g. chemistry, biology). Table 8 shows that science students obtained the highest scores in the PSSS. However the range of scores in the other fields of study is small.

ANOVA indicates that there is a significant difference, $F(4, 2721) = 5.89$, $p < .01$, in problem solving abilities of respondents based on field of study. Scheffe's test shows that the problem solving abilities of science students are significantly different to that of technical and managerial students.

Table 9 shows the ANOVA results of PSSS subscale scores based on field of study. There is significant difference in scores of all four PSSS subscales between fields of study. Scheffe's test shows that scores in the PDFS of science students are significantly different to that of technical, medical, managerial and law students. Science students also showed a significant difference in the DMS and GASS scores to that of technical and managerial students. Regarding the SIVS scores, only the science and technical students showed a significant difference.

TABLE 7
ANOVA Results - Problem Solving Abilities in PSSS Subscales Based on Year of Study

PSSS Subscale		Sum of Squares	df	Mean Square	F	Sig.
PDFS	Between Groups	4.32	2	2.16	7.11	.001
	Within Group	865.03	2851	.30		
	Total	869.35	2853			
DMS	Between Groups	1.92	2	.96	5.55	.004
	Within Group	490.92	2840	.17		
	Total	492.84	2842			
GASS	Between Groups	2.92	2	1.46	7.43	.001
	Within Group	558.11	2845	.20		
	Total	561.02	2847			
SIVS	Between Groups	1.70	2	.85	3.40	.019
	Within Group	607.96	2863	.21		
	Total	609.66	2865			

TABLE 8
Problem Solving Abilities Based on Fields of Study

Fields	n	Mean	Std. Deviation
Technical	869	3.41	.40
Medical	594	3.45	.41
Managerial	782	3.40	.40
Law	148	3.41	.45
Scientific	333	3.51	.42
Total	2726	3.43	.40

Discussions and Recommendations

This study does not focus on students' ability in solving problems in the context of their area of specialization. Field related problem solving is already over emphasized in all subjects of the students' study program. However, the lesser emphasis tends to be placed on skills in the classroom related to real world problem solving, that is social problem solving skills, which are also critical in ensuring that the respective college graduates is competitive in the job market. Gaining entrance to Malaysian universities, especially public universities, is an honour. Due to the limited number of students that each university can accept, especially in fields such as medicine, engineering and law, only the elite students are able to gain entry. Although Malaysian universities have been very selective in identifying students for a particular program, the moderate performance of university students has been commented on by the Ministry of Higher Education (Ministry of Education, 2004) and the public.

As mentioned earlier, Malaysian university students in the current study fared positively, but moderately, in problem solving ability. The same scenario also tends to apply to other nations (Cotton, 2003; Kessell, 1996a; 1996b; Nickerson, 1994, Woods, 1996). Cotton (2003) emphasized that the need to develop higher order thinking, including problem solving, becomes more critical because the number of students who do not acquire the skill is large, and this gives a great advantage in employability. Although the respondents for this study were selected from critical programs, whose entry requirements are generally higher than most other programs, findings indicated that the students lacked generic skills in problem solving, specifically in definition and formulation of problems, in generation of alternatives subscale, in decision making and in implementation and verification of the solution.

In social problem solving, definition and formulation of problems requires one to understand the nature of problems, identify obstacles to goals, delineate realistic objectives, and perceive cause-effect relationships. This is the first step in the problem solving process. Inability to recognize what the problem wants is a stumbling block in the whole problem solving process. Students that are currently enrolled in the undergraduate programs at Malaysian universities are the outcome of a curriculum reform launched in 1989 (Curriculum Development Centre, 2002). The curriculum sets heavy emphasis on the development of problem solving skill. It can be expected that students who undergo the curriculum would have acquired the skill. However, this study indicates that greater emphasis needs to be done at both the school and higher education level.

Generation of alternatives refers to the ability to brainstorm multiple solution ideas. In the Malaysian context, where education at school level is very exam oriented, it is rather difficult to encourage students to generate alternatives. Once a solution is produced, students would prefer to try other problems for them to gain more exposure in solving a variety of problems. This is viewed as a better strategy in securing good grades. Thus, generation of alternatives is not perceived as widening the learning experience. The practice which eventually becomes a habit could not be

TABLE 9
Problem Solving Abilities in PSSS Subscales Based on Fields of Study

PSSS Subscale		Sum of Squares	df	Mean Square	F	Sig.
PDFS	Between Groups	10.22	4	2.56	8.49	.000
	Within Group	857.99	2849	.30		
	Total	868.22	2853			
DMS	Between Groups	2.49	4	.62	3.60	.006
	Within Group	489.59	2837	.17		
	Total	492.08	2841			
GASS	Between Groups	4.67	4	1.17	5.97	.000
	Within Group	555.69	2843	.20		
	Total	560.36	2847			
SIVS	Between Groups	4.15	4	1.04	4.91	.001
	Within Group	605.03	2861	.21		
	Total	609.19	2865			

changed immediately once they entered the university. However, this study also revealed that final year students obtained significantly higher scores in the problem solving inventory as compared to first year students. This means universities do develop problem solving ability in the students progressively during their three to four years of university education. In comparison, Wu, Custer, and Dyrenfurth's (1996) study involving students from five mid-west public universities in the United States found no significant difference between freshmen (first year students) and seniors (final year students) on the overall problem solving scores, that reflects their personal and technological problem solving abilities.

The findings show that students also lack skill in decision making. As discussed earlier, decision making requires the students to identify potential consequences, predict the likelihood of such consequences, and conduct a cost-benefit analysis of the desirability of these outcomes. It is possible that universities are not substantially focusing on the development of this skill. According to Mincemoyer and Perkins (2003), decision making skills can be taught in a variety of curriculum areas. Mann, Harmoni, and Power (1989) concluded that by age 15, many adolescents have achieved a reasonable degree of decision-making competence. However, adolescents do not consistently apply sound decision-making skills to all decisions, especially when dealing with a stressful or conflict-laden situation. Therefore, scenarios and case studies that require and help build up decision making skills should be incorporated more extensively in university courses.

The findings also showed that students lack skill in implementing and verifying solutions. This skill involves the ability to carry out a solution plan optimally, monitor its effects, troubleshoot if the solution is not effective, and self-reinforce if outcome is satisfactory. As discussed above, relevant case studies and scenarios need to be identified to enhance the development of this skill. Although problem-based-learning has been implemented in various university courses, more effort need to be undertaken to help students build specific skills in problem solving. The emphasis on examinations, especially at the secondary level, has also impeded the development of problem solving skill. As stated by Kessel (1996a, 1996b), courses that are so packed with facts and details would not be able to address adequately issue such as problem solving.

In comparing the ability of male and female students in their problem solving abilities, the findings were contrary to the general performance of Malaysian students, especially at the secondary and tertiary levels. It has been a concern of the Malaysian Ministry of Education, especially when public examination figures showed disparity of achievement between genders, that female students tend to outperform their male counterparts (Ministry of Education, 2004). However, in this study, the male students showed significantly higher scores as compared to the female students in the PSSS. This means that the male students were more able to understand problems and finding effective solutions and ways of coping with their problems. It is possible that female students are better in solving content related problems, and thus perform better in examinations. However, female students might not be able to cope as well as the males in everyday social problems. This can be supported by previous studies (Marcotte, Alain, & Gosselin, 1999; Robichaud et al., 2003) that showed that females have a greater tendency to expect problems to be unsolvable.

Preliminary to the study, it was expected that students from different study programs would differ in their problem solving abilities since each discipline differs in academic training and emphases. Findings showed that the problem solving abilities of science students were significantly higher than that of technical and managerial students. However, their problem solving ability was not significantly different from medical and law students. On the whole, it seems that problem solving ability was more developed among science students. The findings of this study are contrary to that of Wu, Custer, and Dyrenfurth's (1996) study. They found that there were no significant differences among the three majors (technology, engineering and humanities) in the overall personal problem solving scale.

One of the implications of this study is the need to rethink the teaching strategies that can be implemented in universities to foster the development of problem solving skills. Teaching strategies that emphasize collaborative work (see Johnson & Johnson, 1996) and the use of cooperative groups (see Heller et al., 1992; Heller & Hollabaugh, 1992) have been shown to be effective. Other pedagogical approaches, as suggested by Froyd (2003), that facilitate development of problem solving skills are active learning, problem-based learning, project-based learning, discovery learning, inquiry-based learning, and case-based learning. Thus, the traditional lecture method that signifies Malaysian university teaching should be selected only for the delivery of certain content.

In summary, the moderate performance of students in problem solving warrants an immediate and effective solution. Further research needs to be conducted to identify means for enhancing problem solving skill through classroom interaction, for both small and large group classes. Although western literatures (Patrick, 1993; Whimbey & Lochhead, 1999; Taconis, Ferguson-Hessler, & Broekkamp, 2001**)** have identified some effective teaching and learning strategies that could enhance development of problem solving skills, it has

yet to be implemented and tested in Malaysian universities.

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Teaching Observations: A Meeting of Minds?

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Teaching observations in a Higher Education context can be underpinned by an observer's intention to enhance learning and teaching or used as a managerial tool to ensure standards are met or maintained. In this article, we investigate whether the emphasis on the developmental value of teaching observations is misleading. We seek to examine whether the 'educational developers as observers' model actually provides evidence that teaching observation can be developmental and stimulate reflective practice despite the approach stemming from government initiatives towards standards-driven teaching. The conclusions provide a view of whether this has implications for fostering formative notions such as critical reflection and enhancement of teaching practice, via the developmental nature of the scheme.

A relatively new phenomenon in higher education in the UK — observation of teaching — is becoming a commonplace process within educational establishments and this is reflected in the research literature (Cosser, 1998; Fullerton, 1999; Shortland, 2004; Wankat & Oreovicz, 1993). The focus of the literature is concentrated upon the way in which schemes have been implemented (Hammersley-Fletcher & Ormond, 2004), highlighting the rationale behind their development, design and structure. However, as Kemp and Gosling (2000) point out, observation can have two distinct purposes.

One purpose reflects a managerial response, a desire to evaluate the quality of teaching and is bound up in the accountability agenda within higher education. Indeed much of the impetus for the increased use of observation, and in particular peer observation (colleagues observing each other's teaching with the intention of improving practice), appears to stem from government initiatives driving at the enhancement of the professionalism of teaching in higher education. Middlehurst & Kennie, (1997, p. 58) said that "teaching expertise is beginning to be separated from research expertise" as academic autonomy is replaced by increasing accountability to a range of stakeholders. The result, as suggested by Nicholls (2001 p. 74), has been a competence-based approach to professional development that highlights "uniformity and comparability of outcomes above quality and creativity". Following such a perspective the observation of teaching, rather than being seen as a constructive feedback tool that engages with practice, becomes viewed as a management tool that assists with the measurement of standards as part of responses to external reviews.

Another purpose that observation can have, according to Kemp and Gosling (2000, p1), is "a developmental means of enhancing the quality of teaching." Hirst (1984) suggests that observation of teaching, in addition to offering staff necessary continuing professional development, can support the renegotiation of prior conceptions and build stronger links between educational theory and practice. However according to Cosser (1998), to date there is little evidence to support the notion that teaching observations are viewed as being developmental by staff in Higher Education. He cites a range of studies that suggest the process is "ineffective" (Van Patten, 1994) and often "detrimental" (Lieberman, 1986). He shares the view of Fleming, Shire, Jones, Pill, and McNamee (2004) that teaching observations are merely a "managerial vehicle".

The current research took Gosling's (2002) suggestion that there are three different models of the observation process as a start point. Two of these models rely upon peers from the same discipline, either senior staff acting as observers or teachers with a similar level of experience observing each other. The evidence suggested that such 'peer review' processes were often of limited developmental benefit and were often resisted by academics. The third model Gosling identified involves educational developers as observers. Bell (2001) has argued for the merits of a combination model where the emphasis is on peer review by colleagues with educational developers playing a secondary, arbitrary role. There appeared little evidence, other than Gosling's, with regard to the impact of the 'educational developers as observers' model. The research reported here investigated whether the 'educational developers as observers' model, although perhaps stemming from the government initiative towards standards-driven teaching, actually provides evidence that teaching observation can be developmental and stimulate reflective practice.

Teaching Observation in Higher Education: Brief Historical Review

By 'teaching observation' we mean direct observation of teaching by colleagues (Fullerton 2003). Teaching, according to Ramsden (2003) is defined to include the aims of the curriculum, the methods of transmitting the knowledge those aims embody, the assessment of students, and the evaluation of the effectiveness of the instruction with which they are provided. The teaching observation process therefore takes account of all these aspects of the process.

A significant part of the research on teaching observations consists of that undertaken within the compulsory sector where the process is an accepted

practice. Teaching in higher education is, however, considered to be substantially different from teaching in primary and secondary education classrooms (Berge 1998). The limited transferability of experience may result from the different skills required of higher education students and the different learning outcomes they are expected to achieve by the end of a university course. It may also result from a series of common conceptions about teaching in higher education that Ramsden (2003, p85) exposes. These include:

- Learning is ultimately the students' responsibility.
- Good teaching in higher education is an elusive, many-sided, idiosyncratic and ultimately indefinable quality.
- Teaching is not important at all because the greater part of learning in higher education takes place apart from lectures and other formal classes.

These conceptions may help to explain why staff in higher education institutions appear to be resistant to the increased use of teaching observations. The view generally expressed is that they are "managerially owned, capability or quality assurance driven observation schemes" that result in "suspicion, mistrust and resistance" (Shortland, 2004, p. 220). For many it appears that observation of their teaching is yet more evidence of the "growth of external and internal regulation and monitoring . . . associated with academic deprofessionalisation" (Newton, 2003, p. 428). As approaches to teaching and learning have gone from the "individual" through "guided" to "directed" approaches (Skelton, 2004) teaching observation is seen as another method by which autonomy is reduced.

The Peer Observation Model

In regard to the peer observation model that Gosling identifies the evidence is certainly not encouraging. Although the National Association of Teachers in Further and Higher Education, NATFHE (2001) has suggested that both observers and observees can benefit from the process, Hammersley-Fletcher & Orsmond (2004, p. 499) indicate that peer review runs the "risk of becoming unfocused and therefore of limited developmental advantage". Their research suggested that both observers and observees were unclear as to the results of the process. Shortland's (2004, p. 226) evidence indicates that staff completed observation documentation "simply to comply with the managerial requirement to do so, having not actually undertaken the observation". Even when staff were free to select their own peer reviewer it was found that they remained distrustful of the process or, as Bell (2001) suggests, they were possibly reluctant to engage in observation programmes because they saw them as a form of appraisal in which judgments were made about the level of competence of those being observed. Just as Willmott (2003) has argued in relation to using peers to review research, using peers to review teaching may similarly obstruct the full implementation of the process.

Despite the above criticisms, the observation process provides a "rare opportunity for an observer to see and analyse what students are actually doing" (Fullerton, 1999, p. 221) as a result of the actions of the observee. Further, as Barnett (1992, p. 123) argues, "academic knowledge does not count as knowledge without it having been subjected to some kind of peer evaluation". A difficulty arises however, as Nixon (1997) suggests, when academics consider the duality of their role: as teachers and subject specialists. When they conceive their identity as located within their discipline it is unlikely, Nixon argues, that they will explore with colleagues the shared aims and values of teaching in higher education. Can educational developers therefore assist and "foster greater reflection on teaching styles, strategies, and general teaching philosophies" that Millis (n.d.) argues should be the focus of the observation process?

The Educational Developer Observation Model

The limitation of using educational developers as observers derives from a belief that without subject knowledge the feedback lacks context. A peer reviewer, with appreciation of the inherent complications of the material can provide feedback on the process, the content and how effectively these corresponded. Gosling (2002, p5) also argued that the educational developer model also presented the risk of a "lack of shared ownership and lack of impact."

However, involving an educational developer who is an 'external academic', without distinct disciplinary knowledge appears to offer an opportunity to address some of the negative aspects of the peer review process identified by Gosling in his first two models. The process is made more transparent. Cosser (1998, p152) argues that such 'external' observations remain flawed and maintains that despite the apparent neutrality these external observers will remain 'blinded by their own conceptions'. He argues that you cannot separate content and process without fragmenting the conceptual nature of learning and teaching and therefore rendering it meaningless. The suggestion is that any observational process is judgemental and loaded. Although the ideal is for an observation that is developmental and not judgemental, by the very nature the process has to involve aspects of the latter. The educational developer model overtly acknowledges this. Both parties are aware that evaluation is required to support development and as such there is an element of "power" held by the observer. Evidence from research (Hammersley-Fletcher & Orsmond 2004; Millis, n.d.) also suggests

that observees believe that there are benefits to be gained from having 'external' observers. Rather than focus on 'content' the observers were seen as more likely to focus on the process of teaching and issues such as the 'student experience' (ibid).

Design and Implementation of Teaching Observations in the Educational Developer Model

The correct format and appropriate process of a teaching observation has been discussed in educational research (see Hammersley-Fletcher & Ormond, 2004). The process itself varies considerably from institution to institution. In some institutions the process consists of one form filled by the tutors/observees, where they outline intentions for the session, introduce the learning outcomes and describe how they believe they will benefit from the observation process in terms of professional development. Elsewhere, the process focuses on an exchange of forms between observer and observee. There is broad agreement on good practice about the constructive elements the observation sessions should incorporate. These elements are constituent parts of any observation process; however the educational developer model can be particularly effective in emphasising key aspects, such as:

1. Reaching a consensus about what actually happened during the observed session. This becomes the product of negotiation between the observer and the observee and is documented in the observation forms.
2. Evaluating the observee's performance by the observer, where either the formative or summative or both aspects of this evaluation are emphasised.
3. Utilizing a consistent approach to specific topics/headings, such as teaching strategies, evaluation and feedback, and professional development, which are used to guide the process.
4. Developing further targets, which are initiated by the observer, however they are also the product of the post-observation discussion. The observee is advised to consider these in an attempt to enhance the teaching profile. Where observation is not a one-off but is linked to a series of observations these areas can form the basis for future observed sessions.

Methodology

The present research focused on examining the impact of teaching observations on participants' practice in two programmes:

- A postgraduate certificate in Academic Practice designed for teaching staff beginning their careers. New lecturing staff are expected to be observed 4 times over a two-year period.
- A graduate certificate in Academic Practice designed for Teaching Assistants in Higher Education. Participants are observed on 3 occasions.

Within both programmes the role of the observer in the teaching observations is undertaken by 5 members of an educational development unit (and not by peers from the participant's own department). In order to gain insight into academics' perceptions of their own teaching, the research initially sought to gain an "awareness of the range of meanings" (Akerlind, 2003, p. 378) that observees/participants assigned to the observation process. The views of 48 participants were sought by questionnaires which were distributed between 2002 and 2004 after the completion of the programme**.**

Given that the focus of the study was on the process of teaching observations and aimed at reflecting individual perceptions, a combination of qualitative and quantitative approaches was selected. Teaching observations involve complex social situations with a large number of variables that cannot be controlled and as such a case study strategy is an appropriate method to use (Yin, 2003). A case study strategy enabled action and events to be set within context by examining one selected setting. The study was designed to take account of the uniqueness of each event by focusing on a particular instance of educational experience (teaching observations) in order to gain theoretical and professional insights from a full documentation of that instance (Freebody, 2003). Achieving this would then deepen our understanding of the implications of observations in higher education undertaken by educational developers.

The questionnaires (see Appendix 1) comprised a number of semi-structured questions in which participants were encouraged to add their comments on the process. These explored the participants' views of teaching observations and the relative value of each of the pre-observation, observation and post-observation components. Other questions investigated whether the process was felt to be supportive and helpful to the participant's practice, and the perceived developmental aspect of the observation process and value to the participants. The decision to use open-ended questions was motivated by a wish to gain as wide a range of responses as possible. For instance, Question 1 was 'What is your view of the teaching observation process?'

Qualitative data collected from the questionnaires were analysed independently by two evaluators to determine common perceptions towards teaching observations which were considered as fundamental to the process by the

participants. The evaluators had extensive experience observing participants from a range of backgrounds and disciplines. Building on the initial focus on participants' perceptions, data were coded by being classified into categories. The evaluators independently selected and coded repeated phrases and views. The categories were mutually exclusive; however there were thematic overlaps, for instance distinct categories each referring to a different component of the observation process (pre/post-observation).

It became apparent that only a partial understanding of the phenomenon under study, teaching observations undertaken by academic developers, was emerging. As Kyburz-Graber (2004, p. 63) warns, the case study method can lead to "superficial inquiry into specific situations". As a result we expanded the case study to examine the approach of the 5 observers who had conducted the observations. Using the categories identified by the evaluators, 16 statements about teaching observations were produced (see Table 1). For instance, regarding the reflective aspect from categories 'reflection including criticality' (evaluator 1) and 'facilitates critical reflection' (evaluator 2) a statement ('teaching observations encourage critical reflection on teaching') was drawn from the questionnaire data to illustrate participant's views on reflection.

The statements (in random order) were given in a card-sorting exercise to the five observers to rank (from 1 to 16) in order of importance/relevance to the teaching observation process. The objective was to explore whether there was any correlation between the views of observers and participants.

Results

Table 1 shows the ranking scores the observers assigned to the above data categories derived from the participant questionnaires. The sum of the rankings resulted in a total score for each category. The minimum possible score was 5 (five observers ranking the statement as first in their list) and the maximum score was 80 (five observers ranking the statement as sixteenth in their list).

The ranking was then examined to consider which perceptions drawn from the participants questionnaires were seen as the most influential by the observers. These categories are discussed in relation to the original aim of the research: to consider whether the 'educational developers as observers' model provides evidence that teaching observation can be developmental and stimulate reflective practice.

These categories are: critical reflection, deepening understanding of learning and teaching strategies, observer-participant relationship, the developmental aspect, the disciplinary aspect, and relative value of the observation components.

Critical Reflection

The reflective process is the area that provides the greatest opportunity for making "inroads into the quality of learning and teaching and can be engendered by a process whose structure is clear and where appropriate time is allocated" (Hammersley-Fletcher & Orsmond 2004, p. 502). The observers considered encouraging critical reflection on teaching as the most important role of teaching observations (see Table 1). Criticality of thought can help practitioners to move towards what Light and Cox (2001) describe as professional realisation and is a result of a deeper understanding of the theories that were covered in the certificate in Academic Practice programmes attended by the participants. As the observers were the staff who ran or contributed to the programmes attended, it may not be that surprising that they made this link. The observers appear to believe that teaching observations enhanced the connections between theory and educational practice. Interestingly, although participants raised critical reflection, this was not one of the major categories that they had identified within their teaching observations.

Deepening Understanding

Observers noted the importance of the teaching observation process in enabling ideas and techniques to be examined in more detail (see Table 1). The participants certainly found it important in enabling them to receive support to test ideas, to develop the confidence to try out new methods and to enhance their understanding of learning and teaching strategies. Cosh (1998) has suggested that there is little real evidence that people develop and improve as a result of the judgements or comments of others. However, the research reported here suggests that the educational developers' model does produce greater understanding which has led to perceived improvement by the participants.

Observer-Participant Relationship

Observers ranked highly the belief that observations should provide a non-intimidating environment for the participants and where feedback was "supportive" (see Table 1). The creation or development of such an environment was linked to the success of the observation process. The relationship between the observer and the participant was a frequent occurrence in the comments in the collected data. Most participants referred to the teaching observation experience as potentially 'daunting' or 'intimidating' at the outset. However, this negative aspect was decisively diminished by the supportive nature of the pre-observation and post-observation sessions. Indeed this relationship sometimes blossomed into mutual appreciation and

TABLE 1
Data Categories and Ranking Scores of Observers.

Data Categories	Observers					Total Score
	A	B	C	D	E	
Teaching observations encourage critical reflection on teaching.	1	2	2	1	1	7
Teaching observations help to flesh out and sometimes to deepen understanding of some of the ideas and techniques that are discussed in the taught sessions.	9	3	6	5	2	25
Teaching observations succeed when they offer a non-intimidating environment.	3	1	8	9	6	27
Teaching observations provide a framework from which observees can develop.	6	10	7	2	3	28
The teaching observation process provides a supportive environment where feedback is discussed.	7	9	4	3	9	32
Teaching observations focus on techniques and delivery rather on discipline specific issues.	5	15	3	7	7	37
The post teaching observation sessions are extremely valuable in aiding the teaching observation process.	11	6	1	4	16	38
Teaching observations highlight problematic aspects of a teaching session.	2	8	11	6	13	40
Teaching observations are helpful when they focus on teaching skills rather than on session content.	8	11	9	8	8	44
Teaching observations offer a good opportunity to discuss with colleagues a range of issues related to learning and teaching.	14	5	5	11	10	45
Teaching observations reassure observees and increase confidence.	4	7	13	10	12	46
The pre teaching observation sessions are extremely valuable in aiding the teaching observation process.	13	4	14	12	5	48
Teaching observations assess the quality of teaching.	12	13	12	14	4	55
Teaching observations are more helpful for participants who have no experience of teaching.	10	12	16	15	15	68
The participant can make the teaching observation process more or less developmental by selecting the session to be observed.	16	16	10	16	11	69
It is useful to have the same person observing rather than a different observer for each teaching observation.	15	15	15	13	14	72

acquired mentoring dimensions.

The creation of a supportive and non-intimidating environment for participants to receive feedback was deemed crucial data. An important factor of this feedback was that it was not summative, as during the whole process the formative nature of the observations was emphasised. The feedback was seen as particularly effective when feedback meetings were held as soon as possible after the observation.

Observation as an On-Going Process: The Developmental Aspect

The emphasis of some teaching observation schemes has been highlighted as being developmental (Shortland, 2004). The implication of professional development is that it is long term and that there is progression. However, research evidence from peer review schemes suggested that there was no long term element involved (Shortland, 2004) and continual professional development was the thorniest of the problems as issues relating to the observer-participant relationship emerged (Brown, Jones, & Rawlinsey, 1993).

Our case study highlighted that the developmental aspect was ranked highly by the observers. The participants responded to a number of questions that explored the developmental nature of teaching observations. The dominant view was that there is a developmental aspect, although this was sometimes dependent upon factors such as choice of session to be observed or employing the same or

different observer. However, the impact of these qualifying factors varied and therefore no predominant factor could be identified (e.g., maintaining the same observer for all the sessions to be observed). The important element is that participants felt that teaching observations conducted by educational developers were part of a longer term developmental process. The importance of "trust" (Shortland, 2004) between observer and participant was also identified as essential in developing reflection with the potential to enhance practice.

The Disciplinary Aspect

It seems that the observers' views on what constitutes 'good teaching' derived from a non-disciplinary view of the teaching session (see Table 1), although subject knowledge or subject application are two facets of the implied subject expertise that is rewarded in the observation 'checklist' that is used as part of the observation process. A relevant question is 'how is this expertise measured' if the observer background is for example in humanities, but observes a tutorial in engineering. The data suggested that sometimes for the participants this expertise was meant to signify confidence in 'delivery' and evidence of knowledge of the subject's complexities. Little concern was expressed by participants about the lack of disciplinary knowledge of the observers. It was acknowledged that the observation looked clearly at the process of teaching rather than exclusively at the content delivered. The participants did not raise concerns about the credibility of the observers to assess teaching quality, an issue raised in Cosser's (1998, p. 153) research, where the participants appeared to be concerned that reviewers might not have the "right qualifications to assess teaching ability." Indeed the second largest response to his research was that those undertaking observation should have some qualification or training in Education. The educational developers/observers in this study had these qualifications and as a result this concern appears not to have surfaced.

Relative Value of the Observation Components

Although the above appear to be the correlations between the observers' and participants' views of the impact and role of teaching observations, it is also worth noting the views concerning the process at the three stages. The observers ranked higher the post observation sessions than the pre-observation discussions (see Table 1). The post-observation sessions were considered to be more valuable in aiding the developmental aspect of the teaching observation process. A likely explanation is that the pre-observation session is sometimes limited to context-setting and organisational issues whereas it is in the post-observation discussion that significant issues are fleshed out and considered. The participants in their evaluation of the observation process equally differentiated between pre and post-observations (see Table 2) indicating that the post-observation was the most significant of all three components.

Other Categories

Other categories such as maintaining the same observer for more than one teaching observation, whether the format of the observed teaching session increases or decreases the developmental aspect of the process, whether teaching observations are more appropriate for inexperienced/experienced staff and the use of teaching observations as an assessment mechanism were brought up by the participants. These categories were not ranked highly by the observers who considered these less fundamental to the nature of teaching observation because they did not directly and significantly contribute to increased reflection and the developmental aspect.

Conclusion

Evidence indicated that observers consistently and explicitly related the observation of teaching to development of teaching practice through the enhancement of reflection which was expressed as a key aspect of the process by participants. The evidence argues for the merit of having educational

TABLE 2.
Participants' Views on Relative Value of Observation Components.

	Highly Valuable	Valuable	Some Value	No Value
Pre-observation	21	14	2	0
Observation	28	9	2	0
Post-observation	36	5	2	0

developers as observers. The 'educational developers as observers' model artificially fragments process and content by emphasising teaching strategies and links to learning and teaching theories within the disciplinary confines.

The research compared the observers' views with the views of the participants. Those observed acknowledged the educational developers as a source of teaching expertise. The case study findings suggest that the formative aspects appear to be those that are considered the most positive by both the observers and the participants. The formative nature of the process was particularly valued by the observees and this concurs with findings by Hodgkinson (1994) and MacKinnon (2001). The summative aspect was not a major component for observers, however the implication was that there should be a procedural framework within which the formative aspect can be nurtured and developed. However, the desire for teaching observations to develop critical reflection, which was the key aspects for the observers, did not appear to be equally acknowledged by participants. The participants' predominant expectation was commonly to gain a verdict upon their teaching competence. As part of this there was an expectation that they would also gain 'tips' on how to improve their skills. The positive knock-on effect appeared to be on increasing confidence. The developmental aspect was recognised as important although participants put more emphasis on assessment of teaching ability. The developmental aspect was often implicit in the participants' comments and a number of them expressed a wish that the process be continued beyond the formal requirements of the programme.

That said, observations within an educational developer observation framework do provide a time to consider knowledge and deepen understanding, and all recognised the importance of constructive and supportive feedback. The formative nature of such feedback determined the attributes of the relationship between observer and observee being non-intimidating and supportive and will potentially contribute to development and improvement.

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APPENDIX 1

Teaching observations questionnaire

Name: (optional)

School/Department: (optional)

1). What is your view of the teaching observation process?

2). Please comment on the value of the following aspects of the teaching observations:

	Highly valuable	Valuable	Of some value	No value
Pre-observation	21	14	2	0
Observation	28	9	2	0
Post-observation	36	5	2	0

3). Have the teaching observations helped your practice? Yes/No
If yes please state how.

4). Has the teaching observation process felt supportive? Yes/No
Please give an explanation for your answer.

5). Do you feel the teaching observation process is developmental? Yes/No
Please give an explanation for your answer.

6). Would you recommend the process to your colleagues? Yes/No
Please give an explanation for your answer.

7). Any other comments.

Thank you

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Reciprocal Teaching for Reading Comprehension in Higher Education: A Strategy for Fostering the Deeper Understanding of Texts

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Assigning students the reading of historical texts, scholarly articles, popular press books, and/or Internet publications is common in higher education. Perhaps equally common is instructor disappointment in students' comprehension of assigned readings. This lack of good reading comprehension skills is exacerbated by the central role of reading comprehension in higher education success. One solution to this problem of poor reading comprehension skills is the explicit teaching of reading comprehension strategies to both undergraduate and graduate students, specifically, reciprocal teaching. In the following article the foundations and methods of reciprocal teaching are defined and then each author, in turn, delineates how he or she uses reciprocal teaching in his or her classroom. These examples demonstrate the flexibility and transferability of this basic strategy as the five authors teach in an array of domains.

Assigning students the reading of historical texts, scholarly articles, popular press books, and/or Internet publications is common in higher education. Perhaps equally common is instructor disappointment in students' comprehension of the assigned readings. That is, "although every student knows how to read, many have never learned good reading skills" (Royse, 2001, p. 127). This lack of good reading skills is exacerbated by the central role of reading comprehension in higher education success. According to Hart and Speece (1998), "one of the greatest demands on students attending post-secondary institutions is the comprehension of many different and difficult texts" (p. 670).

One solution to this problem of poor reading comprehension skills is the explicit teaching of reading comprehension strategies to both undergraduate and graduate students (e.g., reciprocal teaching, SQ4R, induced imagery). Hodge, Palmer, and Scott (1992) determined that college-aged students who were ineffective readers often did not monitor the comprehension of their reading, and rarely instigated any strategies to adjust to deficiencies in reading comprehension. In addition, Meyer, Young, and Bartlett (1989) demonstrated that explicit instruction in reading comprehension strategies is an effective means for improving reading comprehension in adults. Unfortunately, explicit instruction in reading comprehension is rarely taught at the higher education level (see Pressley, Woloshyn, Lysynchuk, Martin, Wood, & Willoughby, 1990; Wilson, 1988).

If strategy usage is known to be effective in promoting reading comprehension, why do instructors and students not employ such strategies? Several reasons may apply: students may not see the relationship between strategy use and success (Butler & Winne, 1995); students may have too little prior knowledge, relative to the task at hand, to employ particular strategies effectively (Carpenter & Just, 1986); students may be more focused on grade performance than on knowledge acquisition (Mayer, 1996); students may view strategy usage as too demanding or difficult (Palmer & Goetz, 1988); and, instructors may assign tasks that are too simplistic to warrant the use of explicit strategies (van Meter, Yokoi, & Pressley, 1994).

Given that the explicit teaching of reading comprehension strategies has been demonstrated to be effective in enhancing learning and performance (see Hattie, Briggs, & Purdie, 1996; Rosenshine, Meister, & Chapman, 1996), the question arises, "What comprehension strategies can be effectively employed in the college classroom?" One answer to this question is reciprocal teaching. In the following sections, the foundations and methods of reciprocal teaching are defined and then each author, in turn, delineates how he or she uses reciprocal teaching in his or her classroom. These examples demonstrate the flexibility and transferability of this basic strategy.

Reciprocal Teaching

Reciprocal teaching is an instructional strategy based on modeling and guided practice, in which the instructor first models a set of reading comprehension strategies and then gradually cedes responsibility for these strategies to the students (Brown & Palaincsar, 1989; Palincsar, 1986; Palincsar & Brown, 1984). Specifically, reciprocal teaching consists of three main components, (a) the teaching and learning of specific reading comprehension strategies, (b) the dialogue between a instructor and students where the instructor

models why, when, and where to use these reading comprehension strategies, and (c) the appropriating of the role of the instructor by the students, that is, students begin to model the reading comprehension strategies for other students. Thus, the goals of reciprocal teaching are for students to learn the reading comprehension strategies, learn how and when to use the strategies, and become self-regulated in the use of these strategies.

The general methodology of reciprocal teaching involves the instructor and students, usually in small groups, reading a section of text. The instructor then leads a discussion of the text, while modeling appropriate reading comprehension strategies. During this dialogue and modeling process, the instructor encourages students to ask questions of both the text and strategies. The instructor uses this dialogue to foster both reading comprehension and strategic cognition. This general process of reading, dialoguing, and clarifying, continues throughout the length of the text. However, as students become more facile with the dialogue process and the reading comprehension strategies, the instructor begins to have students take the role of instructor or dialogue leader. As students begin to lead the dialogue process, the instructor assumes the role of guide or facilitator, rather than leader:

> The instructor models and explains, relinquishing part of the task to novices only at the level each one is capable of negotiating at any one time. Increasingly, as the novice becomes more competent, the instructor increases her demands, requiring participation at a slightly more challenging level. (Palincsar & Brown, 1984, p. 13)

This shift from an instructor-centered approach to a student-centered approach is a central component of the reciprocal teaching process and encourages self-regulation on the part of the students.

Comprehension Strategies

The use of comprehension strategies is one of three central pillars, along with dialogue and the appropriation of the role of instructor by the students, of the reciprocal teaching strategy. Comprehension strategies are organized approaches to engaging in and better understanding texts – to facilitate the creation of meaning during the reading process. Palincsar and Brown (1984), in there original research, used four discrete reading comprehension strategies within reciprocal teaching: questioning, summarizing, clarifying, and predicting.

1. *Questioning:* Questioning involves the identification of information, themes, and ideas that are central and important enough to warrant further consideration. The central or important information, themes, or ideas are used to generate questions that are then used as self-tests for the reader. Questioning provides a context for exploring the text more deeply and assuring the construction of meaning.
2. *Summarizing:* Summarizing is the process of identifying the important information, themes, and ideas within a text and integrating these into a clear and concise statement that communicates the essential meaning of the text. Summarizing may be based on a single paragraph, a section of text, or an entire passage. Summarizing provides the impetus to create a context for understanding the specifics of a text.
3. *Clarifying:* Clarifying involves the identification and clarification of unclear, difficult, or unfamiliar aspects of a text. These aspects may include awkward sentence or passage structure, unfamiliar vocabulary, unclear references, or obscure concepts. Clarifying provides the motivation to remediate confusion through re-reading, the use of context in which the text was written and/or read, and the use of external resources (e.g., dictionary or thesaurus).
4. *Predicting*: Predicting involves combining the reader's prior knowledge, new knowledge from the text, and the text's structure to create hypotheses related to the direction of the text and the author's intent in writing. Predicting provides an overall rationale for reading – to confirm or disconfirm self-generated hypotheses.

In Palincsar and Brown (1984), these four reading comprehension strategies were taught during the dialogue in which the instructor modeled the use of each of the strategies; however, others have successfully taught the reading comprehension strategies prior to engaging in the dialogue process (Palincsar, Brown, & Martin, 1987; Taylor & Frye, 1992).

Dialogue and Appropriation

The aforementioned reading comprehension strategies alone are not sufficient to achieve the goals of reciprocal teaching. Dialogue is also a key component. Dialogue refers to the discussions, questions and answers, and feedback that occur during the process of reading and understanding the text (see Carter &

Fekete, 2001; Palinscar, 1986). During the early stages of reciprocal teaching the instructor explains, in small groups, the overall nature of the reading comprehension strategies, the reasons for their use, and when to use the strategies. The instructor then selects a section of the text and the instructor and students silently read that section. Typically, reciprocal teaching begins with the reading of short passages (e.g., a paragraph or two) and proceeds to longer passages (e.g., an entire section or text).

After reading a section of text the instructor begins to model the reciprocal teaching process by generating and asking a question which the students help to answer. The instructor may ask several questions before summarizing the section of text that was read. Following the summarization process, the instructor will clarify any difficult passages, vocabulary, or structures within the text. Finally, through the use of text-based cues, the instructor will provide a prediction for the next section of text. As the instructor progresses through questioning, summarizing, clarifying, and predicting, the students are not passive, but instead are encouraged to engage in discussion. Specifically,

> students' participation can include (a) elaborating or commenting on another student's summary, (b) suggesting other questions, (c) commenting on another's predictions, (d) requesting clarification of material they did not understand, and (e) helping to resolve misunderstandings. (Rosenshine & Meister, 1994, p. 480)

This cycle of dialogical questioning, summarizing, clarifying, and predicting continue as an instructor-led process until students begin to understand the processes themselves. Gradually the instructor begins to transfer control of the process to the students by having students adopt the role of discussion leader. These leaders then initiate the dialogical questioning, summarizing, clarifying, and predicting process, while the instructor assumes the role of observer and facilitator.

It is at this point that the process of dialogue begins to flourishes with one student asking a question and others providing answers and comments, one student summarizing and others providing elaborations and simplifications, one student identifying difficult passages and others clarifying and obtaining relevant resources, and one student predicting the upcoming text and others refining and provide alternative hypotheses. The use of this dialogue, in conjunction with the reading comprehension strategies, leads to the satisfaction of the previously identified goals of reciprocal teaching – for students to learn the reading comprehension strategies, learn how and when to use the strategies, and become self-regulated in the use of these strategies (see Hart & Speece, 1998, and Rosenshine & Meister, 1994).

Philosophical and Theoretical Foundations for the Use of Reciprocal Teaching

The use of the reciprocal teaching strategy, including the achievement of the goals of reciprocal teaching, is well grounded in the literature on social constructivist philosophy and cognitive psychology theory. This grounding is essential as it separates the reciprocal teaching strategy from folk psychology strategies, and provides a robust rationale for its use.

Social constructivism, as a foundation for the use of reciprocal teaching, emphasizes the social genesis of knowledge; that is, "every function in the [student's] cultural development appears twice: first, on the social level, and later, on the individual level" (Vygotsky, 1978, p. 57). This social genesis of knowledge construction is comprised of three primary assumptions: (a) knowledge and meaning are active creations of socialization; (b) knowledge and meaning are social creations and as such reflect social negotiation and consensus; and (c) knowledge and meaning are constructed for the purposes of social adaptation, discourse, and goal achievement (Gergen, 1999; Prawat & Floden, 1994). These three assumptions are evident in reciprocal teaching; specifically, reciprocal teaching is based on active socialization, both instructor-student and student-student interactions, where the knowledge that is constructed from the given text is negotiated within discourse communities and is not merely transferred from instructor to student. In addition, reciprocal teaching emphasizes the instrumentalist supposition that knowledge is to be useful. That is, reciprocal teaching emphasizes the role of language in communication, understanding, and action.

While social constructivism provides a solid philosophical foundation for the use of reciprocal teaching, cognitive psychology provides a solid theoretical foundation. There is ample empirical evidence from cognitive psychology to suggest the usefulness of reciprocal teaching in fostering comprehension. Rosenshine and Meister (1994) conducted a meta-analysis of 16 quantitative studies focusing on reciprocal teaching and concluded that (a) reciprocal teaching had a significant positive effect on students' reading comprehension performance relative to instructor-made assessments (effect size =. 88), and (b) reciprocal teaching had a significant and positive effect on students' reading comprehension performance relative to standardized tests (effect size =. 32). Further, Rosenshine and Meister's analysis also revealed that reciprocal teaching is most effective for older and poorer reading students. These results bode well for the effective use of reciprocal teaching in higher education.

Variations on a Theme

While the methodology delineated by Palincsar and Brown (1984) and Palincsar (1986) is well defined, three variations on this methodology have also been demonstrated to be effective. These variations include using different reading comprehension strategies, modeling to different sized groups, and teaching the reading comprehension strategies directly and at different times relative to the dialogue. The Miami-Dade County Public Schools' Project MERIT (Reciprocal teaching, n.d.) successfully added the strategy of visualizing to the Palincsar and Brown's original three strategies. In addition, De Corte, Verschaffel, and Van de Ven (2001) successfully modeled the reading comprehension strategies in front of the whole class, rather than in small groups. Finally, Palincsar, David, Winn, Stevens, and Brown (1990) successfully taught students the reading comprehension strategies before the dialogue process.

These variations on the Palincsar and Brown (1994) methodology are important as they demonstrate the flexibility and transferability of the reciprocal teaching strategy. The next section delineates how the authors of this article have effectively used the basic reciprocal teaching methodology within different contexts.

Reciprocal Teaching in Action

Case #1: Reciprocal Teaching and the Reading of Scholarly Articles (Peter Doolittle)

In a graduate educational psychology class that is taught by the first author, Constructivism and Education, students are required to read philosophically and theoretically dense texts peppered with novel, polysyllabic, and multi-definitional words. Early in the semester, reading these types of texts is frustrating to the students, as they tend to lack the necessary prior knowledge of philosophy, constructivism, and educational psychology to unpack the text to the point of comprehension. To combat this frustration, a version of reciprocal teaching that is in general accord with the methodology proposed by Palincsar (1986) and Palincsar and Brown (1994) is used. The methodology for this augmented version of reciprocal teaching involves the same dialogic methodology used by Palincsar and Brown (i.e., a progression from instructor-centered to student-centered text inquiry), with a variation in the reading comprehension strategies used. These strategies are taught explicitly and modeled to the entire class, simultaneously, in a manner similar to that of Palincsar, David, Winn, Stevens, and Brown (1990). The modified reading comprehension strategies employed for reading the dense philosophical and theoretical texts include summarizing, clarifying, integrating, and elaborating. The reading comprehension strategies of summarizing and clarifying have been defined previously and will not be reiterated here.

Integration, however, involves making explicit connections between (a) the new section of the text and the previously read sections of the same text, and (b) the new section of the text and previous readings (i.e., different texts). Thus, integration occurs both within the current text and between texts. Integration provides the catalyst to synthesize one's knowledge, in order to avoid inert knowledge and foster functional knowledge (Bransford & Vye, 1989). In addition to integration, students are to engage in elaboration. Elaboration involves explicitly relating the new section of the text to one's prior knowledge. Elaboration moves beyond relating the new text to previously read texts and includes making a broad array of connections to one's educational experiences, vocational experiences, and general knowledge of the world (see Dole, Duffy, Roehler, & Pearson, 1991). Specifically, elaboration leads to an enhanced personalization of the text and its meaning.

These four reading comprehension strategies - summarizing, clarifying, integrating, and elaborating - are implemented in the following manner. After reading a section of text, the lead student summarizes his or her current understanding of the text. The other students add to and/or comment on the lead student's summary as needed. The lead student then identifies sections of the text where clarification is needed. The lead student elicits the help of the other students in this process of clarification. The lead student then attempts to integrate the current section of text with the preceding sections of the same text. These connections are extended by other students before the lead student attempts to make connections between the current text and other relevant texts. After making inter- and intra-textual connections, the lead student guides a discussion that focuses on connecting the current text passage to the individual group member's prior knowledge. Finally, the reciprocal teaching cycle ends where it began, with the lead student summarizing the section of text just read.

This augmented reciprocal teaching methodology fosters meaningful learning where knowledge is integrated with other texts, one's prior knowledge, and others' perspectives. The use of this augmented reciprocal teaching methodology has resulted in students that are more adept at reading, interpreting, and comprehending difficult texts, as well as students that are better equipped to write more highly integrated papers.

Case #2: Facilitating Historical Inquiry in the Social Studies (David Hicks)

Teaching history to students who have simply experienced high school history via the traditional textbook is often a frustrating experience for both professor and students, especially when the time arrives to engage in historical inquiry. Wineburg's (1991) research on how students analyze multiple historical sources reveals that students approach historical sources as they would any narrative. The historical texts were viewed as nothing more that a "repository of facts." The dangers of such an approach to reading historical sources is that students simply accept what is written within the texts at face value and fail to recognize and take into account the importance of the historical context of which the source is a part.

Seixas (1998) contends that if students are to learn to read historical texts, instructors must be willing and able to teach students, explicitly, the metacognitive strategies and historical habits of mind required to engage in the process of historical inquiry. This is by no means an easy task but professors can facilitate the process of analyzing historical sources by guiding students through a process of asking spiraling questions designed to encourage students to go beyond a superficial glance at a source.

The process of teaching students how to analyze historical sources can be broken into five overlapping stages: Summarizing, Contextualizing, Inferencing, Monitoring, and Corroborating. Summarizing begins with having students quickly examine the documentary aspects of the text, by asking such basic questions as: What does the source directly tell us? Contextualizing begins the process of having students spend more time with the source in order to explore the authentic aspects of the text in terms of locating the source within time and space. Inferencing is designed to provide students with the opportunity to revisit initial facts gleaned from the source and begin to read subtexts and make inferences based upon their developing understanding of the context and continued examination of the source. Monitoring is a key stage in examining individual sources. Here students are expected to question and reflect upon their initial assumptions and process in terms of the overall focus on the historical question being studied. Corroborating only starts when students have analyzed a series of sources, and are ready to extend and deepen their analysis through comparing and contrasting the evidence gleaned from each source in light of the overall topic of investigation.

Within each stage, there exists a series of spiraling trigger questions that students should learn to ask as they initially begin to examine specific historical sources (see Figure 1). To help students learn how to move through this process they are provided with the source analysis chart (see Figure 1). The chart can be used in a number of ways. Often students copy this chart onto full sized chart paper placed on the classroom wall. The students place, copy, or describe a source in the central Source Description box. Each subsequent layered box represents one of the specific stages of the analysis process. Students' answers to each stage's trigger questions are written within the corresponding box. However, telling students how to engage in this process of historical inquiry is not enough, instead the process is modeled for students using a think-aloud protocol – the instructor verbalizes his or her thoughts, unfiltered, as he or she works through an analysis. An example of this modeling process, and the subsequent progression from an instructor-centered analysis to a student-centered analysis, follows.

Consider the following question as a focus of historical analysis: How did World War II impact life in southwest Virginia? The historical analysis process begins by placing a text document focusing on price controls in the center box. Students are asked to listen to the types of questions asked by the instructor during the think-aloud, the responses generated, and the rationales for the questions and answers within each stage of analysis. A second example is also modeled using the think-aloud, a photograph from the same World War II period.

Following the completion of both think-aloud modeling protocols, students are asked to identify specific instructor based questions that aided in the analysis of these sources. Using these student generated questions, a third source from the period is placed within a new chart. This time the instructor guides the students through the process by asking them what questions they would ask of the source at each stage and discussing, refining, and writing up student responses on the chart. The goal is for the classroom exchange to shift from an instructor-led to a student-led discussion and analysis. Upon completion of the guided class analysis, students are divided into groups of three or four and each supplied with an historical source pertaining to the question under exploration. Students are then asked to analyze their source in the same way they have seen modeled and subsequently practiced in class.

The result is that the walls of the classroom are covered with historical sources that have been thoroughly interrogated by students as they explore a specific historical question. Each group presents their analysis of their source to the class. During the initial presentations, the instructor directs the students to take notice of the final stage of the analysis process – corroboration. Between presentations, the instructor, again using the think aloud protocol, begins to model

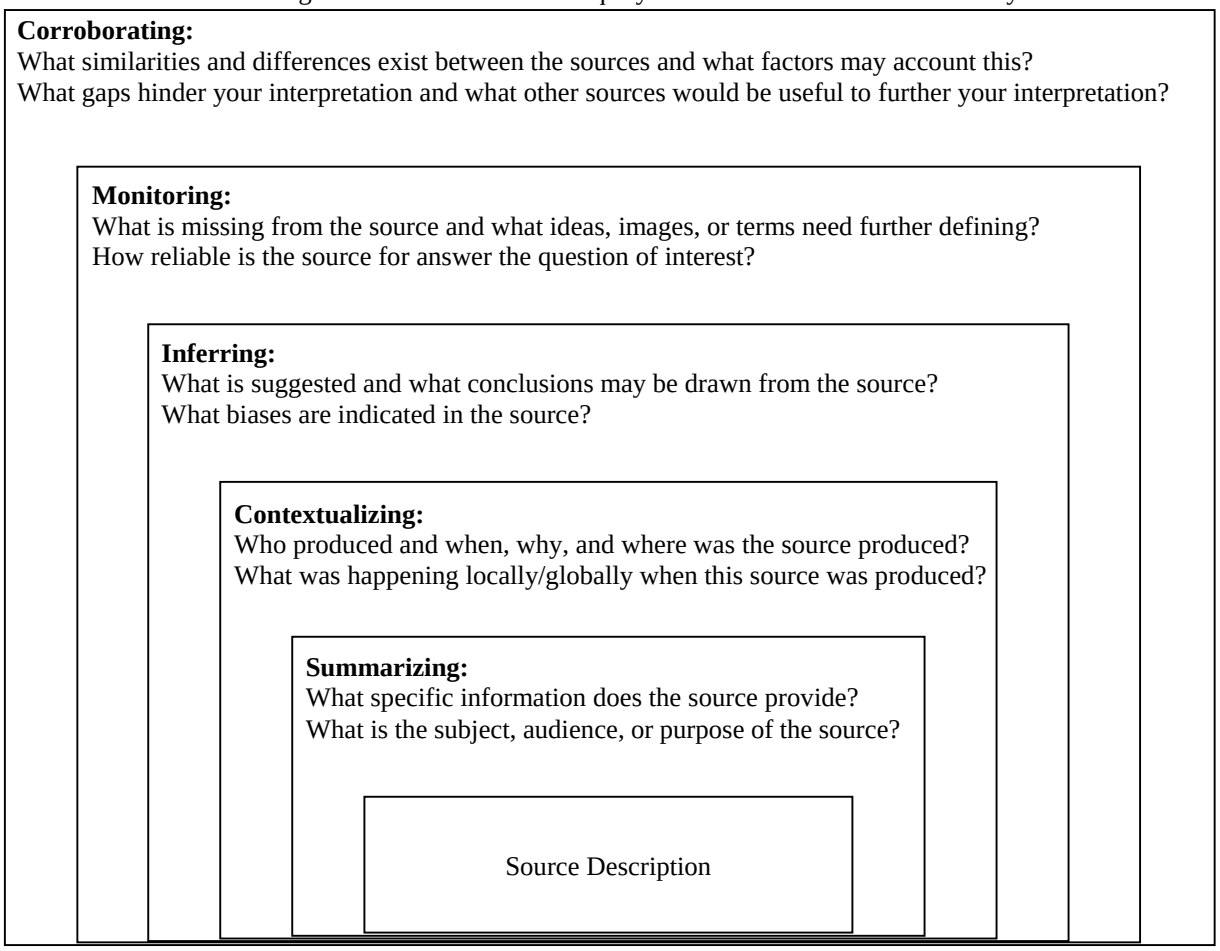
the process of corroboration between sources. As students begin to engage more fully in the corroboration process themselves, by comparing and contrasting evidence and identifying similarities and differences between the sources in light of the historical question being asked, the instructor begins to transfer ownership of the corroborating process to students.

Case #3: Thinking Before, During, and After Reading (Cheri Triplett)

In my Theories and Practice in Content Literacy course, which is designed for preservice elementary school instructors; my students and I talk about comprehension and comprehension strategies on the first day of class. I am always dumbfounded by the students' stories of "reading the chapter and answering the questions at the end." At a time when we know so much about improving comprehension, it is disappointing to hear that these are often the only instructions students receive about reading in the content areas. "In order to comprehend a text," I explain, "you must think before, during, and after reading." Reciprocal teaching is a strategy that can help students think and comprehend before, during, and after reading.

One of the paramount issues addressed in the literacy course is the content of the classroom textbooks. It is essential for the preservice instructors to critique the information they read in textbooks and trade books. It is equally essential for them to consult multiple sources when exploring a particular topic, especially in the area of history. Although school textbooks have been criticized for their minimalist views of history, they continue to be the genre of choice in the social studies classroom (Schug, Western, & Enochs, 1997).

FIGURE 1
A Chart Designed to Foster Historical Inquiry Based on Historical Source Analysis.



In order to begin a discussion about the critical reading of history texts; we read a chapter about Abraham Lincoln from a classroom textbook; we read an award-winning children's book, Lincoln, a Photobiography (Freedman, 1987); and we read a critical essay about Lincoln from Lies My Instructor Told Me (Loewen, 1995). The purpose of reading these three texts sequentially is three-fold. First, I want to challenge the preservice instructors' assumptions by exposing them to three very different perspectives about Abraham Lincoln. Secondly, I want my students to be exposed to three very different genres that are appropriate for social studies instruction. Lastly, I want my students to learn to think before, during, and after reading.

The process of reciprocal teaching helps my students to think before, during, and after they read each text. The process I utilize introduces four specific comprehension strategies: activating prior knowledge, which takes place before the reading of text; questioning and clarifying, which takes place during the reading; and, summarizing, which takes place after the reading. For example, when we read the chapter about Abraham Lincoln from a classroom textbook, I usually lead in the process with the whole group as follows:

1. I lead a discussion about what they already know about Abraham Lincoln.
2. I have students read the chapter, recording their questions and comments as they go. These may include questions about vocabulary and text structure, as well as questions about Lincoln himself.
3. I lead a discussion about their questions and comments, clarifying new and challenging information.
4. I lead a discussion summarizing the article, emphasizing what they have learned.

By the time we read the chapter from Lies My Instructor Told Me (Loewen, 1995), students are able to lead themselves through this process in small groups, having a rich discussion about what they know, what has challenged their thinking, and what they have learned from reading. Ultimately, these preservice instructors are more likely to implement reciprocal teaching in their own classrooms because they have experienced the benefits of this process as learners.

Case #4: Reciprocal Teaching and Technology for the Reading of Assigned Texts (Dee Nichols)

Recent research into the uses of technology for instruction in assisting reading comprehension have consisted of investigations in authentic classrooms, thus taking into account the dynamic factors that influence teaching and learning (Baumann, Dillon, Shockley, Alverman, & Reinking, 1996; Reinking, Labbo, & McKenna, 1997). In one of the reports, Reinking and associates generated a list of pedagogical generalizations intended to serve as a basis for using technology in improving reading comprehension. According to these generalizations, technology can promote the integration of reading and writing activities for purposeful communication, and can facilitate students' reading and writing by providing individualized assistance thus reducing the drudgery associated with some aspects of reading difficult text.

In addition to these studies examining the benefits of using technologically enhanced instruction, numerous pedagogically-oriented studies have demonstrated that students can be taught learning strategies and that these strategies in turn will improve students comprehension of difficult text (Dole, Brown, & Trathen, 1996; Paris, Wasik, & Turner, 1991). In addition, students who are taught these strategies not only comprehend the text, but they also arrive at a richer understanding of the text and are more likely to improve their abilities to use the strategies in other settings (Auerbach & Paxton, 1997; Pearson & Fielding, 1991).

Nichols, Wood and Rickelman (2001) in a recent examination of using technology to engage students, concluded that through the combination of technology and learning strategies, instructors can design instruction that allows students to work collaboratively, help students remain purposefully engaged in the learning task, and provide individual responses to all students. In light of this investigation, it has been my attempt to combine reciprocal teaching with technology through an online content area reading course, Comprehending Processes and Reading in the Content Areas Online.

Even though one of the generalizations of technology assisted instruction is that technology can create opportunities for purposeful communication, many students taking an online course often express lack of instructor involvement and feelings of isolation (Wolcott, 1996). Typically, in a traditional classroom, the instructor provides an opportunity to discuss the text assignments under their orchestrated movements, but during an online course, students' opportunities for discussion with others regarding the text can be limited without proper planning and intervention. In order to promote discussion regarding assigned readings and improving overall comprehension, I have attempted to combine reciprocal teaching with online threaded discussions and virtual classrooms.

Using a team-oriented approach, I assign chapters of the text to teams of learners. For example, I may break down the Vacca and Vacca (2002) Content Area Reading text into the following assignments: Team 1 is responsible for Chapter 1, Reading Matters; Team 2 is responsible for Chapter 2, Learning with Textbooks, Trade Books and Electronic Texts; and Team 3 is responsible for Chapter 3 Making Authentic Assessments. All students are responsible for reading all chapters, but the assigned teams are responsible for leading the discussion and utilizing comprehension strategies for their specific chapter. Once the chapters are assigned to teams of five, I then assign the rotating reciprocal teaching tasks to the team members. For example, Member 1 of the team is responsible for providing a summary of the chapter; Member 2 is responsible for clarifying confusing parts of the text and making connections between the text and personal experiences; Member 3 is responsible for generating questions from the chapter that they feel are key to the comprehension of the text and feel could be included on an exam; Member 4 is responsible for predicting the authors' intentions of the chapter and the rationale for the chapter; and Member 5 is responsible for designing some type of visual representation or graphic organizer for the chapter. While the graphic organizer component is not part of the comprehension strategies associated with reciprocal teaching (Palincsar & Brown, 1984), it is my addition to the reciprocal teaching model that I currently use. Once the individual team members have completed their tasks, I encourage them to meet in the virtual classroom, a modified chat room, to discuss the chapter and their individual assignments. They are responsible for making sure that each team member has each of the comprehension strategies associated with reciprocal teaching. Once each team has completed their assignment, they then post their chapter on the threaded discussion board where other students respond and interact as a continuation of the reciprocal teaching process.

After all of the teams have posted their reciprocal teaching components for the assigned chapters the other students are instructed to respond or reply to the team regarding the chapter. The expert team then, in essence teaches their chapter to the other learners in the class, thus promoting meaningful communication regarding the text and improving comprehension of text often viewed as cumbersome.

Case #5: Theory Into Practice: Extending Comprehension (Carl Young)

In my Teaching English in the Middle and Secondary Schools methods class, the course themes of language, literacy, and culture are explored in the context of the English language arts classroom and the words and worlds of the students with whom we interact. Together, we explore what it means to be an instructor of literacy in the 21st Century. While practical aims of teaching are addressed, we also explore the symbiotic relationship between theory and practice in order to gain a sense of the continuum along which we can construct a vision of pedagogical theory capable of meeting the needs of all students.

As a part of our focus on better understanding the complexities of literacy, students read selections from Paulo Freire and Donaldo Macedo's Literacy: Reading the Word and the World (1987), a theoretical text that often proves difficult for many students. Part of what Freire and Macedo accomplish in their text is to provide a historical overview and critique of the traditional approaches to reading (e.g., academic, utilitarian, cognitive, and romantic). As an alternative, they advocate for a different approach, one characterized as a literacy of empowerment in which "educators should never allow the students' voice to be sacrificed, since it is the only means through which they make sense of their own experience in the world" (p. 152).

Getting students, most of whom are privileged, to see themselves as anything but an outsider to the language or the issues with which Freire and Macedo engage can be a challenge. If students remain outsiders to Freire's work on pedagogy and literacy, they miss one of his central messages – that one must remake Freire's language (e.g., words like critical literacy, oppression, dominant culture, liberatory pedagogy, etc.) in one's own particular context and that this has to happen before they can even begin to consider language instruction in more global contexts.

Making the transition from theory to practice is important, but it is not without complications. Consequently, I try to create practical applications to inspire student participation in the process of enacting critical literacy. Reciprocal teaching is a strategy that allows students to experiment with making the transition from theory to practice while extending their understanding of texts. The process I utilize in conjunction with reading the Freire and Macedo text involves a series of carefully constructed steps which aim to engage students in the theory and practice of critical literacy advocated by the authors while students simultaneously engage in specific comprehension strategies: activating prior knowledge; key word identification and definitions (during the reading process); summary rewritings (after reading the text); and keyword reflections (after class discussion and the creation of culture notebooks). To be more specific, the process usually follows along these lines:

1. Using their own schooling histories and previous course readings, students activate

prior knowledge by entertaining questions about and free writing on the concept of literacy, each developing a tentative definition for "literacy" before they read the text. As a part of this initial step, I model the creation of a schooling timeline and discuss how our histories might inform our perceptions of literacy.

2. With the above prewriting, students have created an immediate context for beginning to read and process Freire and Macedo's thoughts. Taking Freire's assertion that "reading always involves critical perception, interpretation, and rewriting of what is read" (p. 36) as a cue, we then attempt to put his suggestion into practice.

   Difficult texts often pose challenges to the reader when the language employed has few reference points for the reader, either in their personal experience or in their vocabulary. One strategy for approaching such a text is to inquire into its vocabulary. If students can get a handle on the words that carry the essence of a text's meaning, the "keywords" that shape the narrative, then they can create shared points of reference to bring into discussions of the text.

   After I introduce, discuss, and model the keyword strategy, students then are directed to make a list of what they perceive to be "keywords" in each chapter as they read. For each keyword, they are to write in their own words what they understand the authors to mean through their use of the word. After I model the approach with the initial chapter, students then complete chapter rewrites in which they rewrite the chapter in their own words as a means of critical summary.

3. With keywords and chapter rewrites in hand, we begin a discussion of the text and start to identify the larger body of keywords that we have in common. Here, students take on the role of identifying and categorizing the key vocabulary driving the text. Then they take this a step further using an adaptation of a methodology of Freire's called the "popular culture notebook" as a means of clarifying the text and its meaning. Students take on the role of lexicographer for specific keywords, meaning that they are responsible for providing additional insights into Freire's language by creating an engaging, informative, and dynamic keyword entry. In effect, students create their own shared course text or culture notebook comprised of keyword entries. These might include investigations of word origins, illustrations of the word's use in the text and the world at large, explorations of figurative possibilities, relationships to other words (synonyms or antonyms), and meditations on its relevance to literacy, the teaching of literacy, and society in general. Prior to their beginning, I provide students with examples of keyword entries that serve as possible models.

4. Once compiled, copies of the class culture notebook are provided to students as an anthology of keyword entries. The culture notebook not only allows students the opportunity to learn from one another through their keyword entries but also through the use of the notebook as a working dialogical journal. In other words, students not only read the entries, but they also compose critical reflections on selected keyword entries—an additional means of meta-analysis while further developing critical reading and thinking skills. Thus, the keyword entries as well as the keyword entry critical reflections then become texts for students to share and discuss—a means to teach and to learn from one another while pushing for a greater critical awareness of their own life experiences.

In this case, reciprocal teaching takes the form of a process aimed at helping students to forge connections between theory and practice as they engage in the reading and analysis of a challenging text. Freire's choice of words can be viewed as a way of recording, investigating, and presenting problems of meaning in the area of literacy. While to understand the meaning of any given word is a step toward effective communication with others, our inquiry is ultimately about meanings being made with those words. By modeling critical reading and comprehension strategies for students (e.g., activating prior knowledge, keyword entries, chapter rewrites, culture notebooks, critical reflections, and dialogue) and then having them

experiment with them, students realize that literacy is not about the isolated practice of using a dictionary. Instead, it is about garnering meaning from the context in which an author writes and developing a critical understanding of how the different words connect and interact with each other. Ultimately, reciprocal teaching, as employed here, is a way for readers to map the meaning of a specific text as they begin to seek their own meaning and, in doing so, come to discover connections between the word and the world they might not otherwise have thought existed.

Conclusion

Reading comprehension is an essential component to higher education success; yet, reading comprehension instruction receives short shrift in higher education. This short shrift is not due to a lack of research in reading comprehension – there is a plethora of research regarding the teaching and learning of reading comprehension strategies, as well as the positive effects of these strategies, on comprehension and critical thinking (see Pearson & Felding, 1991; Tierney & Cunningham, 1984; Tierney & Readence, 2000). Unfortunately, as Anderson, Reder, & Simon (1998) have lamented, the "science of human learning has never had a large influence on the practice of education" (p. 227).

This lamentable situation can be easily changed through the conscious application of reading comprehension strategies in the higher education classroom. While there are many reading comprehension strategies available (see Tierney & Readence, 2000), the current article has focused on reciprocal teaching. Reciprocal teaching provides the higher education instructor with a useful tool for engaging students, individually and socially, in the exploration and critical evaluation of texts. In addition, the use of reciprocal teaching also satisfies the criteria for promoting effective strategy use. These criteria include the following:

1. Strategy instruction is effective when students learn a strategy within the contexts in which the strategy will eventually be employed, using contextually relevant tasks (Paris & Paris, 2001; Pressley, Harris, & Marks, 2001).
2. Strategy instruction is effective when a new strategy is practiced with a wide variety of tasks, in a wide variety of contexts, and on a continual basis (Brown & Palincsar, 1987; Mayer & Whittrock, 1996).
3. Strategy instruction is effective when students are provided scaffolding during early strategy use that is curtailed as students become more effective in their strategy use (Katayama & Robinson, 2000; Rogoff, 1990).
4. Strategy instruction is effective when instructors model effective strategy use for students, especially when this modeling takes the form of thinking aloud (Pressly, El-Dinary, Marks, Brown, & Stein, 1992; Pressley, Harris, & Marks, 1992).
5. Strategy instruction is effective when students understand why strategies are important and under what conditions specific strategies are effective (Paris & Paris, 2001; Pressley, Borkowski, & Schnieder, 1987).
6. Strategy instruction is effective when students are taught to self-monitor and self-evaluate their own strategy use and strategy results (Belfiore & Hornyak, 1998; Zimmerman, Bonner, & Kovach, 1996).

Reciprocal teaching, when used appropriately, is a strategy that encompasses each of these effective strategy instruction criteria. In addition, the case examples previously discussed provide a broad range of text-based models of effective strategy use. Reciprocal teaching is a reading comprehension strategy that has withstood the tests of time, usage, and empirical research. Ultimately, reciprocal teaching provides a theoretically sound avenue for fostering the deeper understanding of texts within the higher education academic environment.

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Recruiting Instructional Technology Specialists for Faculty Development

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Colleges and universities face challenges when recruiting instructional technology (IT) specialists to assist faculty with instructional development, course and curricular redesign, and teaching innovations. Lack of clear standards for IT skills and knowledge impedes the effective recruitment of IT specialists for faculty development in higher education institutions. This article discusses the work of an IT specialist, analyzes the key IT skills and knowledge from IT position descriptions, and explains a search process that the Center for Research on Learning and Teaching (CRLT) at the University of Michigan uses to recruit qualified IT specialists and faculty developers.

Instructional technology (IT) has become an integral part of teaching and faculty development. As more college instructors integrate technology into teaching, higher education institutions must respond by improving their support for faculty. IT specialists can help faculty effectively integrate technology into teaching and other professional activities. However, college and universities often find it difficult to recruit qualified IT specialists to work with faculty on instructional development, course and curricular design, teaching initiatives, and pedagogical innovations (Strauss, 2000; West, 1998). Although U.S. colleges and universities offer degrees and certificate programs for technology specialists, instructional technologists, curriculum developers, and media specialists to work in K-12 education settings, very few institutions prepare graduates for an IT specialist role in higher education faculty development. Without well-defined credentials, there is not a clear standard for the knowledge and skills needed to hire a qualified IT specialist.

Who can best support the faculty and institution's efforts to integrate technology into teaching? What key skills and knowledge should an IT specialist have? How can colleges and universities recruit qualified IT specialists for faculty development? In this article, we will examine the work of an IT specialist, identify key skills and knowledge for this profession, and describe the method the Center for Research on Learning and Teaching (CRLT) at the University of Michigan uses to recruit qualified instructional specialists or consultants for faculty development in higher education.

The Work of IT Specialists for Faculty Development

Many people view instructional technology (IT) as the use of audiovisual equipment and computer hardware and software, such as films, videos, overhead projectors, computers, and PowerPoint. Others view it as a process of design and implementation. What does IT really encompass?

The use of technology in teaching and training first started in the early twentieth century. During the Second World War, the mass training needs of the U.S. military led to the development of innovative methods of instruction through new technologies, such as the overhead projector, radios, and film (Seattler, 1968). The study of these instructional aids and their impact on instruction led to the development of a field now known as instructional technology.

The President's Commission on Instructional Technology (1970, p. 19) defines IT in two ways: 1) "the media born of the communications revolution, which can be used for instructional purposes alongside the teacher, textbook, and blackboard," and 2) "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communications, and employing a combination of human and nonhuman resources to bring about more effective instruction."

IT is a complex field that concerns both the processes of learning and teaching and the products that support these activities. Instruction, the design of learning environments, the assessment of student learning, and technology tools are some of the topics under the IT umbrella. As a field, IT relates to many other disciplines such as information science and technology, computer science and technology, education, psychology, sociology, and business management.

Due to the complexity of the field, institutions use a number of different titles to describe the IT profession. When browsing through IT-related job ads in publications such as the *Chronicle of Higher Education*, one may find position titles such as instructional designer, media specialist, media consultant, instructional technologist, and IT specialist. Some jobs focus more on one particular aspect of the field. Instructional designers in industry or corporations, for example, concentrate on designing instructional and training materials, while a media specialist, in a K-12 environment or a higher education

institution, primarily provides support for instruction in the local setting. However, the work of an IT specialist for faculty development in higher education concerns every aspect of IT, from the use of equipment to the application of techniques and strategies derived from research in solving instructional problems. A college or university IT specialist has responsibilities that are as diverse and complex as those of faculty developers.

Degrees and Certificates in the Field

Few institutions offer programs that are targeted to students who wish to become IT specialists in higher education faculty development. A search of the 2005 *Peterson's* graduate program guide identifies 242 institutions that offer certificates or post-graduate degrees in educational media or instructional technology. However, most of these are K-12 oriented, and only 34 offer a doctorate described by the institution as preparing students for a career in a higher education context. Most likely, only a subset of these 34, such as Indiana University, Bloomington, allows students to concentrate in IT for faculty development.

Desired IT Skills and Knowledge for Faculty Development

What are the key skills and knowledge higher education institutions look for in an IT specialist? Using the *Chronicle of Higher Education* job listings and the listserv archives for the Professional and Organizational Development Network (POD) from January 1, 2003 to December 1, 2004, we found 26 advertisements for faculty development positions that involved a significant amount of IT work. Thirteen of the advertisements were for jobs in a research university setting, while seven applied to a master's college or university context, two to baccalaureate colleges, and four to associate's colleges. We analyzed the postings to examine the needed skills and knowledge described in the advertisement's description of the position's responsibilities, as well as the institution's requirements for a successful application.

An analysis of these postings finds that there are several key skills or background knowledge bases that are most sought by colleges and universities who wish to hire IT specialists. Here, we highlight the skills or knowledge listed in at least half of the advertisements.

Consultation with faculty or teaching assistants is the most frequently mentioned professional activity, found in nineteen of the advertisements. Often, IT specialists may consult with faculty on three key areas: use of instructional software, integrating technology in teaching effectively, and evaluating the impact of technology on teaching and learning:

- *Coaching and consultation in instructional software.* The IT specialist provides individual coaching and consultation to those instructors who want to use institution-supported software programs such as graphics programs and the course management system. These instructors typically have limited technology skills and/or find that most technology workshops do not suit their learning needs. They desire individual coaching, that is, one-to-one hands-on training.
- *Consultation on teaching with technology.* The IT specialist with expertise in learning and communications assists faculty members to explore and examine ways of using technology in learning and teaching. This type of consultation often occurs with individuals or small groups of faculty in a department or college.
- *Evaluation of the impact of technology on learning and teaching.* As faculty members start using technology in classrooms, they need to gather student feedback on technology uses in teaching. The IT specialist with proper technology skills and knowledge of research in IT can help faculty members identify the right questions for investigating the impact of technology on teaching and learning. In many institutions, the investigation of technology use in classrooms is a collaborative effort for a number of units such as an office for evaluation, an office for instructional technology, and a teaching center.

The expertise needed to be an effective consultant is complex, involving affective and intellectual preparation, such as how to build trust with a client, knowledge of pedagogy and cognitive psychology, and counseling skills (Border, 1997).

Knowledge or experience in course or curriculum planning is described in seventeen of the postings. Course and curriculum design involves both a process of rethinking/reexamining course objectives, assignments, and student learning, as well as an exploration of assessment methods and technology tools. The IT specialist with expertise in instructional design and development can help faculty members and departments with course and curriculum (re)design and development projects.

Communication skills, either aural, oral, or written, are frequently called for, noted in fifteen of the positions. Because IT specialists must decode features of technology tools for instructors, summarize technology uses and trends in instruction for faculty and departments, and write about their work, strong communication skills are a necessity.

General knowledge or experience in IT was noted in fourteen job advertisements. Interestingly, calls for specific instructional technology experience occurred with less frequency. Experience with a particular course management software was the most frequently mentioned specialized skill (12 mentions), but other key items included knowledge of instructional technology products to make selection decisions for an institution (8), a background in online teaching (7), knowledge of a specific computer program or platform (6), and multimedia and web development experience (5).

With the advance of technology and change of student demographics, visual learning, distance, and e-learning have become attractive forms of instruction in higher educational institutions (American Federation of Teachers, 2001). Many professional schools and colleges offer courses to both on-campus and distance students. Faculty members who teach distance and e-learning courses need training in both technology and pedagogy, and many instructors who teach traditional courses also seek to add a visual component to keep students' attention and distribute reading and assignment materials through the course management system.

Teamwork and collaboration skills are requested in fourteen position descriptions. The organizational development role of IT specialists, or collaboration with support units on campus, is another key area of responsibility. The IT specialist often works with staff from other central and college/school/department support units to provide faculty with instructional support, such as hands-on technology workshops, pedagogical seminars, and other teaching with technology programs. Additionally, in a teaching center, the IT specialist must work collaboratively with other faculty developers.

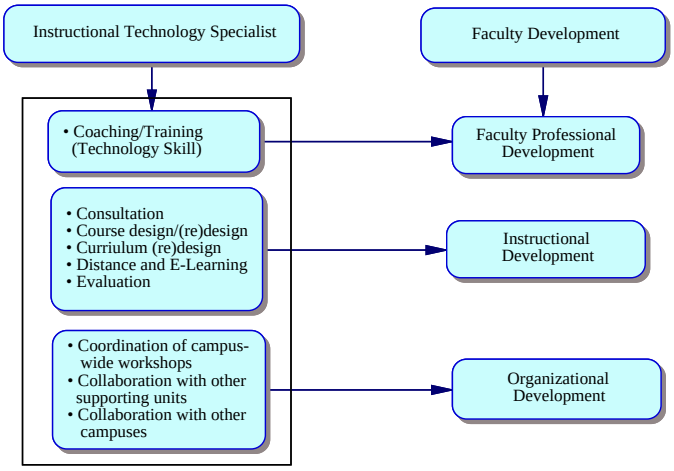
Finally, a background in pedagogical theory is listed frequently in the advertisements, appearing in fourteen position descriptions. Knowledge of learning styles and adult learners are the most frequently mentioned topics within this theme. Having a background in the research on teaching and learning generally is useful for an IT specialist to help the faculty and institution enhance teaching and improve student learning through the effective use of technology.

This analysis demonstrates that a comprehensive set of knowledge and skills is needed to support and serve faculty well in their efforts to integrate technology into teaching. Other research has identified analytical abilities, IT knowledge, and social skills as the most important competencies for any IT professional (Hilton, 2001). However, the higher education professional development position listings indicate that while general knowledge of IT and relational skills also are important in this setting, pedagogical training is critical. Background in pedagogical theory and strategy is important because knowledge of teaching, learning styles, and theories can serve an IT specialist well in incorporating technology tools across the disciplines.

IT Work Areas

The typical work of an IT specialist in higher education includes coaching and training technology skills, consultation in various areas of teaching, course design and evaluation, and coordination of campus-wide programs. The IT specialist's work overlaps with that of a faculty developer, whose work areas are outlined as faculty development, instructional development, and organizational development by the POD Network (Diamond, 1988 & POD, 2004). As illustrated in Figure 1, an IT specialist, like a faculty developer, contributes to the professional development of faculty members and helps the institution promote teaching and learning initiatives. Of course, the specific duties of an IT specialist will be defined by the

FIGURE 1
Typical Work of an IT Specialist



needs of the institution and the organizational structure of a teaching center or an instructional development office in the institution.

Recruitment of Qualified IT Specialists for Faculty Development

The skills and knowledge needed to be an IT specialist are extensive and complex. It can be a challenge to recruit a qualified IT specialist who can effectively fulfill the complex responsibilities. Effective recruitment requires careful planning and a process that enables candidates to demonstrate their knowledge and skills and recruiters to observe and identify the candidate's skills and knowledge.

Faculty recruitment in higher education and the steps for faculty hiring are clearly outlined in many articles including those by Half (1985), Perlman and McCann (1996), Ryan and Martinson (1996), and Tucker (1993). However, few publications describe the process of recruiting faculty developers or IT specialists in higher education. (Hilton [2001] summarizes common IT hiring practices in industry, such as standardized tests or structured interviews.) Below, we describe the hiring process used at the Center for Research on Learning and Teaching (CRLT) at the University of Michigan, which is designed to authentically assess the fit of an IT specialist or instructional consultant with the organization's and institution's needs. Although our process resembles the search for a faculty member or an administrator, the uniqueness and effectiveness of our search lies in the use of scenario-based interviews, the involvement of faculty members, technology staff, and graduate student instructors, and the candidate's own reflection of performance during the interview.

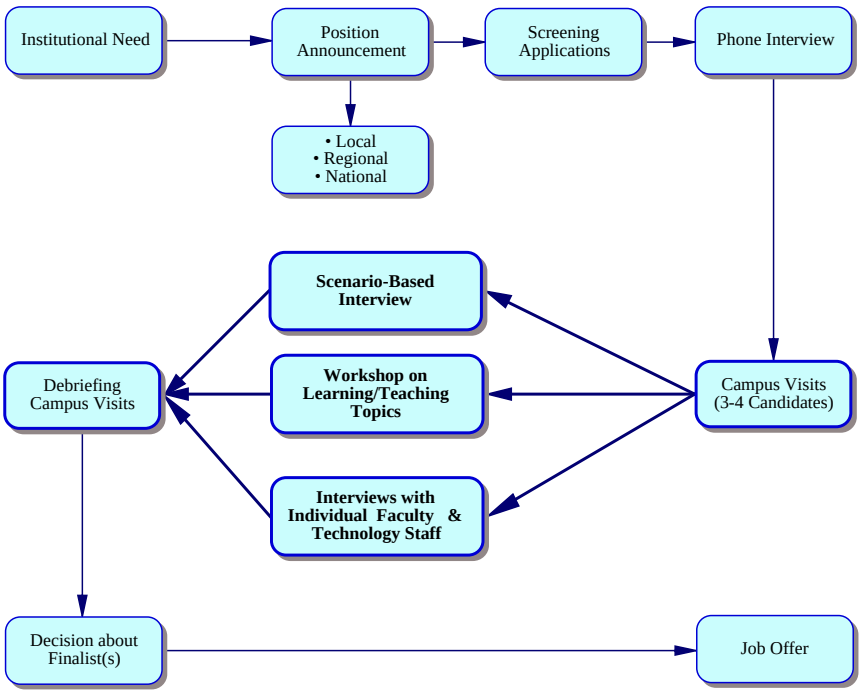
Description of the Position

Institutional need is usually the impetus behind the search for an IT specialist. The teaching center or the instructional development office first identifies the need for an IT specialist and defines the required qualifications, skills and knowledge for the position (Figure 2). The job announcement is then advertised in local, regional, and national publications and on listservs. For example, the job announcement from CRLT was published in the *Ann Arbor News* (local newspaper), POD listserv, American Educational Research Association (AERA) listserv, and *Chronicle of Higher Education.* The position listing analysis above may provide a useful starting point for organizations seeking to hire an IT specialist, but institutions should also analyze their own needs for a new hire. At CRLT, a search committee, comprised of CRLT staff and key stakeholders, screens applications and interviews selected candidates, primarily through a campus visit process.

Campus Visit

The campus visit consists of the scenario-based interview, sample workshop and reflection, and interviews with individual faculty members, faculty developers, and technology staff.

FIGURE 2
Search Process



Scenario-based interview. The scenario-based or case-based interview is common in business management, law, and consulting firms (White, 1998), but it is rarely used in recruiting faculty members, faculty developers, and IT specialists. The purposes of using the scenario-based interview are to test the candidate's analytical, communication, and consultation skills; to assess the candidate's knowledge and resourcefulness; and to see how well the candidate performs under pressure.

The scenario-based interview places the candidate in a role-playing situation, where the candidate plays the role of an instructional consultant and one interviewer plays a faculty member or department administrator. Other interviewers observe the role-play. After the candidate is presented with an instructional problem, the dialogue between the consultant and faculty member starts. The candidate or the interview facilitator can stop the simulated consultation at any time. Once the role-play stops (typically, after about 20 minutes), the candidate is asked to step back, analyze, and reflect on his or her own actions and the process. For example, the reflection will explain why more information was requested, questions asked, suggestions proposed, or resources presented.

The interview scenarios usually are based on instructional problems (classroom/department) that require the candidate to analyze the issue, answer questions, and provide solutions to the problem. In faculty development, consultation, communication and analytical skills, and knowledge of teaching and learning are critical. The scenario-based interview provides a way for the interviewers to see how the candidate applies his or her skills and knowledge in a real world situation.

Although the scenario-based interview places the candidate in a realistic consultation situation, where he or she can best demonstrate knowledge and skills, the selection and creation of the scenario require attention and prudence. First, the scenario should reflect or be based on real instructional problems and be representative of faculty development or IT work in the institution. The scenario can be a general teaching consultation or consultation on technology and teaching, but it ideally is so complex that no simple or single answer will be sufficient to solve the problem. The complex problem usually requires the candidate to seek multiple perspectives and solutions and then to identify the most appropriate ones for the specific situation. The scenarios selected for the candidate's interview should also reflect multiple aspects of the IT work. Coaching a faculty member to use technology in teaching, consultation with faculty members and departments regarding technology use in classrooms, and collaborative work on campus are key IT work areas.

Faculty from each institution should craft their own scenarios that reflect their own needs and work at the institution. The following are suggestions of general topics that could be used for an interview, followed by an explanation of how to assess the candidate's performance during the interview.

Coaching a faculty member to use technology in teaching. For this scenario, the candidate plays the role of an IT specialist while one interviewer assumes the role of the faculty member. The faculty member starts the conversation by telling the IT specialist that s/he would like to use PowerPoint to create simple presentations for a large lecture course. Since the faculty member has never used PowerPoint, s/he would like to learn it. The professor went to a PowerPoint workshop last semester, but did not learn much because the workshop pace was too fast.

This scenario highlights how the use of PowerPoint in relation to the course goals and student learning outcomes is an important issue in technology and teaching. Best practices of PowerPoint in lectures, as well as teaching strategies that involve students in active learning during lectures, are relevant to the consultation. Other topics that may arise are how to learn technology skills and computer applications. Additionally, the use of PowerPoint for lectures may have implications for ways that the professor teaches and expectations students have about the faculty and course (e.g., students may ask for PowerPoint handouts before a lecture).

These related issues and questions are useful for evaluating the candidate's performance. An IT specialist, unlike a server administrator, web editor, or hardware/software support staff, should be able to teach the faculty technology skills, but go beyond points-and-clicks to discuss course goals and student learning outcomes, as well as to explain possible effects of technology on teaching and learning.

Consultation with faculty members and departments regarding the use of a course management system such as Blackboard, WebCT or other home-grown tools (like CTools at the University of Michigan) can serve as a second topic for the interview. In this scenario, a faculty member would like to examine options for using the course management system in teaching. The interviewer again plays the role of the faculty while the candidate is the IT specialist.

The consultation about the use of a course management system involves many issues such as purposes and functions of the system, management of teaching and learning resources, course design, and student engagement in learning. Once the faculty member understands the system's features, he or she can then decide how it will be used in a particular course. Many instructors use discussion features, synchronous or asynchronous, in the course

management system to prepare or extend classroom discussions. The facilitation and management of an online discussion, which involves different skills and considerations than a face-to-face classroom discussion, will be part of the conversation.

Working collaboratively with a department technology director can be a third scenario for the interview. The IT specialist is a consultant who not only provides service to all faculty and teaching assistants on campus, but also serves as a liaison between units. In this scenario, a department IT director meets with the IT specialist to discuss the use of instructional technology in the department. The department mandated the use of a course management system, endorsed the purchase and installation of a classroom response system in a number of classrooms, and pledged to help faculty incorporate technology into teaching. The interviewer plays the role of the department IT director.

This conversation may highlight several areas of teaching and technology, including the selection of technology tools, technology skill training, course planning, student learning outcomes, the effects of technology on teaching and learning, promoting active learning using technology, and pedagogy.

Coordination and collaboration is an important part of the work of an IT specialist for faculty development. The role-play will help the interviewers to see the candidate's skills working in a team environment and knowledge and skills about providing customized IT services for departments.

Evaluation. Those observing the role-play will want to pay particular attention to how the candidate addresses the following issues:

- Did the consultant ask questions about the faculty member's prior experiences with technology, as well as his/her current teaching needs? What levels of questions did the candidate ask during the role-play?
- What consultation style(s) did the candidate utilize (e.g., expert, problem-solver, collaborator) and were they appropriate for the scenario (Brinko, 1997)?
- How did the candidate handle technical or design questions from the faculty member?
- How did the candidate deal with any resistance from the instructor or departmental technology director?
- What other campus resources were recommended?
- What collaborative efforts were suggested and discussed?
- What follow-up activities were planned?
- Did the candidate demonstrate knowledge of current research and best practices on teaching and learning?
- What level of reflectivity did the candidate demonstrate about the role-play scenario?

In addition, the role-play will demonstrate whether the candidate is a good listener, communicator, and problem-solver. Besides key IT skills and knowledge, consultation and other general skills such as analysis, communication, and decision-making are focal points for observation during the role-play and for discussion and debriefing after the interview.

Sample Workshop and Reflection. In the search process, the scenario-based interviews are followed by the candidate's workshop on teaching and learning. Candidates choose a topic and present a one-hour interactive workshop during the campus visit. The interactive workshop simulates the regular seminars offered during the semester at the University of Michigan. Faculty members and graduate student instructors who may be interested in the workshop topic usually are invited to attend the workshop. At the end of the workshop, candidates are asked to reflect on the audience's questions, explain their own answers, suggest areas where they might have done better (especially if the workshop had been longer), and assess whether the goals for the workshop have been achieved.

The ability to step back and self-evaluate is critical for faculty developers and IT specialists in higher education. This process enables one to improve practice over the long-term, as well as to make timely adjustments whenever necessary during a program. Such adjustments and mid-way corrections are important because faculty developers work with individual faculty members with diverse backgrounds, disciplines and personalities, rather than with templates and tools. At the same time, the reflection offers the interviewers the opportunity to see the candidate's ability and skills to conduct interactive workshops and to work with an audience on instructional issues.

Final Interviews. Finally, the candidate meets with individual faculty developers, faculty members and technology staff. The individual interviews provide the candidate with the opportunity to learn the work of individuals at the institution and to ask questions that may not be suitable at the group meeting. Most faculty developers may find it difficult to give an adequate assessment of the technology skills of an IT specialist. The individual interview with technology staff offers a much better assessment of the candidate's technology skills and ability to keep abreast of technology development and research in higher education. Additionally, if the candidate is offered a position, the

individual interviews help key campus constituencies buy into the hiring process.

The campus visit provides an enormous amount of valuable information and data for the debriefing and the final decision. The interviewers will debrief the candidate's performance during the campus visit, highlight the presence and absence of the core skills and knowledge of IT and faculty development in the candidate, and decide on a candidate. The essence of the CRLT search process is the scenario-based interviews, the reflection on the workshop, and individual interviews with faculty and technology staff. The search process recruits qualified faculty developers and IT specialists for faculty development at the University of Michigan. However, none of the activities in this search process is fixed. Any activities in the search process can be adjusted to an institution's needs and integrated into the institution's own search practices.

Conclusion

An IT specialist for faculty development in higher education faces responsibilities and challenges that are quite different from those for IT personnel in design and development or technology specialists in K-12 settings. The IT specialist for faculty development in higher education needs to possess a complex array of skills and knowledge in both faculty development, generally, but also in the effective use of technology. An IT specialist with a well-balanced set of technology skills and pedagogical knowledge can best support the faculty and institution's efforts to integrate technology into teaching. Since there are not clearly defined credentials for an IT specialist in a faculty development setting, CRLT has developed an interview process to better assess a job candidate's qualifications. The combination of a scenario-based interview, workshop and reflection, and individual interviews enables CRLT to identify and recruit qualified professionals for IT and faculty development.

This paper describes key work areas for IT faculty development through job descriptions, which are employers' perceptions of the skills the position entails. Therefore, future research should focus on practitioners in the field, or IT specialists and faculty, to find out what skills and knowledge serve them best in practice. This research can significantly enhance teaching and learning in a higher education system that is becoming increasingly dependent on the effective use of technology.

Of course, few candidates can be expected to be well-trained in all areas of faculty development and IT work. Mentoring and professional development for faculty developers and IT specialists are still necessary, as are effective ways to keep them up to date with research findings, issues and best practices of teaching and learning in higher education, and technology skills. Once new hires assume the responsibilities of faculty development and IT in a higher education institution, they still will need to learn "to do the work," "about the work" and "from the work" (Candy, 1991 & Wilcox, 1997, p. 23).

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Portfolio in Higher Education: Time for a Clarificatory Framework

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The article distinguishes between four modes of implementation of portfolio in, and in relation to, higher education. These range from the use of portfolio in admissions to higher education, during the higher education course, on entry into the profession and for ongoing professional development. There is a tremendous diversity of portfolio types in use in higher education courses, which manifests itself in a large number of applications and classifications. A classification which we regard as worthy of universal acceptance is that which distinguishes between portfolios aimed at profession-specific competencies and portfolios aimed at learning competencies. In higher education portfolios aimed at profession-specific competencies yield a limited added value because they only provide supplementary information compared to other and better tools. Portfolio aimed at learning competencies adds genuine value in higher education if we want our graduates to be capable of continuing to learn on a life-long basis. The assessment of profession-specific competencies and learning competencies by means of portfolio by the same evaluator is to be strongly discouraged as it is highly prejudicial to the reliability of the reflections.

There is a great deal of discussion about the use of portfolios in higher education, yet this is still the subject of a fair amount of confusion. The concept 'portfolio' has many different meanings. The purpose of this article is to provide a degree of clarification by distinguishing four modes of implementation of portfolio in higher education. We then go on to consider the question as to whether it is worthwhile to establish categories of different types of portfolios in higher education. Furthermore, we adopt a particular position with regard to this debate. In our view portfolio is not a neutral tool. It cannot be used indiscriminately within every educational vision. Nor is it a learning tool suitable for all competencies. These views may well not be very fashionable, but we believe it is high time for a critical reflection.

The Container Concept 'Portfolio'

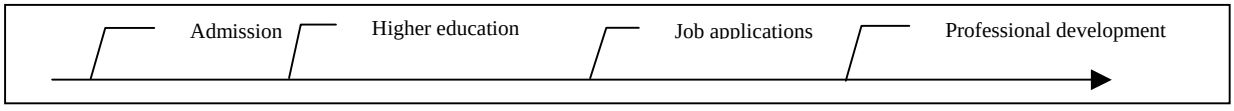
Portfolio has a very wide variety of applications in higher education. The 'portfolio' concept can be adapted very easily to the wishes of the user and the requirements of the context. This flexibility is part of what makes portfolio such a powerful tool, but it also has a negative side. It is scarcely possible to give a general description of portfolio because this depends so heavily on how the tool is used (Wolf & Siu-Runyan, 1996). However, in order to provide at least some degree of clarification, we begin by distinguishing four modes of implementation of portfolio, in and in relation to, higher education. First we will review the usefulness of portfolio for the various modes of implementation and we will then go on to focus on the value or otherwise of the current nomenclature and classifications of portfolio types in higher education.

Modes of Implementation

We have identified four different modes of implementation for portfolio in, and in relation to higher education which have a very significant determinant effect on how the portfolio concept is interpreted. These modes of implementation can be represented on a time-line (see Figure 1). This time-line provides an overview of the possible use of portfolio from the perspective of life-long learning, including higher education and career. Portfolio can play a role:

1) In admissions to higher education: for the assessment of competencies acquired elsewhere by students applying for admission.
2) During the higher education course: for the supervision and assessment of the initial competencies of the student.
3) On entrance into the profession: for use in connection with job applications.
4) As part of professional life: for ongoing professional development, on the job.

FIGURE 1
Time Line Showing the Four Modes of Portfolio Implementation in, and in Relation to, Higher Education



The first mode of implementation represented on the time-line above is related to the trend towards the *flexibilization* of higher education. Numerous experiments are in progress all over Europe involving flexible learning pathways (van der Wende & Huisman, 2003). Assessment procedures are being developed in order to take into account qualifications acquired previously and competencies acquired elsewhere for the design of shortened study routes (van der Wende & van de Ven, 2003). Such study routes are individualized course programmes, by definition shorter than the standard study routes for regular students. Therefore the competencies of the candidate are matched with the course programme purposes. Portfolio crops up as a frequent element in these admissions procedures. In combination with other tools it is regarded as a suitable tool for ascertaining the initial position of the applicant (Uhlenbeck, 2003). It serves as a way of screening acquired competencies, as a means of self-assessment and as a tool for collecting together evidence of competencies (Klarus, 2002). For instance, a candidate for Primary Teacher Education with a certificate of the local arts academia is released from the music course, or a candidate for the study of Health Care with experiences in a day-care centre delivers evidence of nursery competencies with children. In most cases portfolio takes the form of a file to be filled by the applicant with the course directors laying down precise stipulations with regard to minimum submissions and/or the materials to be included by way of evidence of the acquisition of competencies in order to be eligible for recognition. Compiling a portfolio may take the applicant a few hours or a few days. The gathering of the necessary proof material sometimes requires even more time. If this results in the applicant receiving a shortened study duration, it is worth the effort. It is clear that this is an example of a standardised portfolio application, namely the use of portfolio as an extended Curriculum Vitae.

A very different mode of implementation is that of portfolio as a supervision and evaluation tool as part of the courses in higher education. An increasing number of courses acknowledge portfolio as a tool for the supervision and assessment of the initial competencies of the student. There is, after all, a need for new tools of this type. From an educational standpoint there has been a trend in higher education in recent years towards a greater tailoring of the courses to the needs of professional practice. This has resulted in a continuous series of innovations in higher education in the direction of more competence-orientated educational formats. Portfolio functions here as a competence-orientated educational tool. The student puts together his or her portfolio during his or her course and this is monitored by one or more course instructors. For instance, a student in Primary Teacher Education collects lesson plans and samples of videotaped lessons to show his or her teaching competencies. Or a student in Health Care writes reflections on his or her position and functioning in the hospital team. Yet there is sometimes an economic motivation for introducing portfolio in higher education courses. In a number of cases an increasingly large group of students is taught by an ever smaller body of course instructors. An attempt is being made to compensate for the reduced supervision facilities by means of portfolio. Whether portfolio can meet this expectation, however, is open to considerable doubt. It should be borne in mind that the supervision and assessment of portfolios requires an enormous time investment on the part of the course instructor (Walther-Thomas & Brownell, 2001; Oosterhuis-Geers, 2001). Courses which opt for portfolio rather on the basis of economic motives, may well in our view end up being disappointed.

Portfolio can also be of use on entry to the profession. When an applicant is asked to present a letter of application and a Curriculum Vitae, he or she can submit his or her portfolio. Portfolio differs from the classic CV by virtue of its scope and its creative execution. Whereas a CV is usually limited to a summary of factual information, a portfolio contains examples or representations of the work and the professional achievement of the applicant (Frederick et al, 2000). For instance, a graduate from Primary Teacher Education submits a cd-rom with evidence of good teaching experiences. Or a graduate in Health Care hands over a first-aid box with medical equipment referring to successful interventions. According to Slingerland (2001, p.64) a portfolio is preferable to a CV for application purposes because a portfolio makes a bigger impression. Research does indeed reveal that managers are often strongly influenced by the design of portfolios submitted when making their assessments of candidates (Wolf et al, 1997). Other research, however, suggests that many managers are rather sceptical with regard to the value of portfolios in the context of job applications (Theel, 2002). Some managers mention time constraints, others don't believe that portfolios provide meaningful evidence of the competencies of the applicant.

For completeness sake, and as a final mode of implementation we should mention the introduction of portfolio as part of ongoing professional development pathways after higher education (Seldin, 2000; Twisk, 2000). Professional development implies a life-long process which finds concrete expression in qualitative changes in the thinking and professional practice. The assessment of the quality of the work of the professional concerned by means of portfolios as part of a process of ongoing professional development provides a way of ensuring an adequate reflection of the individuality of the professional and the complexity of the working environment in which professionals habitually operate. For instance, a primary school teacher keeps

record of his experiences with different classes and pupils. Or a nurse documents her assignments in different wards in the medical branch. The development of portfolio-supported ongoing professional development pathways can generally be integrated into the competence management of organisations (van der Heijden, 1999).

For the different modes of implementation of portfolio in, and in relation to, higher education there are different expectations. In what follows we will concentrate exclusively on the use of portfolio for supervision and evaluation in the higher education courses. We will also briefly consider the question as to whether it is worthwhile developing specific nomenclatures for particular types of portfolio and drawing up systems of classification.

Nomenclature and Classifications

With regard to portfolio in higher education courses there is no single standard application, but rather an amalgam of applications. Each specific educational context with its specific educational objectives gives rise to its own specific portfolio. A rapid screening of the recent literature yields at least 49 different nomenclatures used to describe particular types of portfolio (Meeus & Van Looy, 2005; see Table 1). On closer scrutiny it is apparent that there are many portfolios with the same nomenclature being used for widely differing applications. We also found applications which were extremely similar designated with different nomenclatures. At first sight this diversity might be considered as enriching, but it brings communication problems in its wake. It is all too often assumed that merely giving the name of a specific portfolio type is sufficient to ensure that the reader knows exactly which sort of portfolio is being referred to. What should we infer from the terms 'behaviour portfolio', 'evaluation portfolio' or 'meta-portfolio'? The less specialized reader no longer sees the wood for the trees, while specialists can argue until they are blue in the face only to discover that in reality they are talking about different portfolios with the same name. Nomenclature on its own is just not enough. The typical characteristics and the implementation context of portfolio must be clearly specified each time.

In order to clarify this rather confused situation, many authors have attempted to make a classification of portfolios. Various applications are grouped together in a limited number of categories or types. Screening of the recent literature yielded 28 different classifications (Meeus & Van Looy, 2005; see Table 2). For many of these classifications it was also difficult to ascertain the precise criteria on which they were based. What was supposed to have brought clarification, has in fact resulted in additional confusion. Classifications must therefore clearly indicate on which criteria they are based, or it is better not to make them. It is especially unfortunate that in the vast majority of cases the classification offered is presented as *the* internationally acknowledged, standard classification of portfolios. What is intended as an attempt at clarification seems to have contributed very little to the furthering of the debate. The simple truth is that with the current state of the academic study there is still no universally acknowledged classification.

TABLE 1
Some Examples of Nomenclatures

Smart portfolio	(Wilcox, 1996)
Documentation portfolio	(Farr & Tone, 1998)
Professional portfolio	(Winsor et al, 1999)
Learner portfolio	(Salend, 2001)
Introductory portfolio	(Foote, 2001)
Course portfolio	(Kelchtermans, 2001)
Meta-portfolio	(Janssens et al, 2002)
Developmental portfolio	(Mansvelder-Longayroux et al, 2002)
Instruction portfolio	(Eisendrath & Carette, 2002)
Demonstration portfolio	(Chalfen, 2004)

Portfolio Not for Every Educational Vision

With the amalgam of applications of portfolio in higher education it looks as if portfolio can be introduced into any course profile. We believe that this is a false impression. Portfolio is conditioned by its origins. It has been adopted by higher education from a particular vision of education. In the following paragraphs we argue that portfolio cannot be usefully employed in every educational vision. Nor do we consider portfolio to be useful in every phase of the course.

TABLE 2
Some Examples of Classifications

Presentation portfolio / Working portfolio	(Dietz, 1994)
Ownership portfolio / Feedback portfolio / Accountability portfolio	(Wolf & Siu-Runyan, 1996)
Evaluative portfolio / Archival portfolio	(Wortham et al, 1998)
Exemplary portfolio / Objective portfolio	(Duffy et al, 1999)
Evaluation portfolio / Employability portfolio / Professional growth portfolio	(Tanner et al, 2000)
Everything portfolio / Process portfolio / Product portfolio	(Campbell & Brummett, 2002)
Training portfolio / Personal development portfolio	(Smith & Tillema, 2003)

Skill or Savoir-faire?

Portfolio in higher education is not a neutral tool. It has been developed from a particular educational vision and still bears the marks of this. In order to understand this we have to go back to the origins of the concept. Bird (1990) was the first to write an article on an entirely hypothetical application of portfolio in higher education, specifically in teacher education. With his search for alternative evaluation methods, he was reacting against the dominant psychometric approach to assessment in the United States. It is no accident that he sought his inspiration in the artistic world. Higher education can, after all, be focused on savoir-faire (artistry) or skill (technical ability).

The tension between higher education focused on savoir-faire or skill is probably as old as higher education itself. The adepts of higher education focused on skill maintain that professionals must first and foremost have sufficient knowledge and must have mastered sufficient techniques. Professionals are seen as trained technicians. From this vision the task of the course instructors is to impart to their students the necessary knowledge and the correct techniques by the transfer of knowledge or the training of isolated skills. The central focus is therefore on the technical ability of the professionals.

The proponents of higher education focused on savoir-faire can be recognized by their adherence to the idea that there is no such thing as the good professional. Professionals are seen as artistic personalities. They use the possibilities of the working environment in order to come up with a creative solution for complex and unpredictable problems which present themselves (Schön, 1987). From within this vision, the task of the course instructors is to foster the problem-solving capacity of the students and to help them develop a personal style. The central focus is therefore on the artistry of the professionals.

In our view both visions have shortcomings with regard to the education of professionals. Both visions highlight a different facet of professional performance. A good professional must have a minimum equipment in terms of knowledge and skills and have a healthy dose of creativity and problem-solving capacity. In higher education students must get the chance to acquire the necessary techniques and to hone their artistry. We advocate an integrated vision whereby the course curriculum in higher education makes room for skill and savoir-faire.

Portfolio in 'Higher Education Focused on Savoir-faire'

Imparting basic knowledge and skills presupposes a different approach from fostering the development of artistry. In other words, each educational vision has its own approach, which in turn requires a suitable array of tools (see Table 3).

In higher education focused on skill the central emphasis is on knowledge transfer and the training of isolated skills. The psychometric approach of assessment is aimed at tabulating these kinds of knowledge and skills. Knowledge tests and skills-labs are typical tools within this vision. However, they have limited power to assess the complexity of artistry.

Portfolio on the other hand was borrowed from the artistic domain as a reaction against the psychometric approach of assessment. In a portfolio 'artists' show their public professional self via a personal selection of materials (Castiglione, 1997). In higher education portfolio is a dossier by means of which the students demonstrate their qualities as future professionals. Portfolio is therefore a form of (indirect) performance assessment. Does this mean therefore that portfolio cannot be used as a psychometric evaluation tool? On the face of it using portfolio for the assessment of knowledge of skills is likely to lead to disappointment. This ought not to be a surprise given that this method of evaluation is not tailored to the knowledge objectives targeted (Van Petegem & Vanhoof, 2002).

TABLE 3
To Each Educational Vision Its Own Array of Tools

Educational vision	Object	Mode of evaluation	Examples of artefacts & tools
Focused on skill	Technical ability	Psychometric evaluation	• Examination for knowledge evaluation • Checklist for skills-lab observation • Chronometer for triathlon
Focused on savoir-faire	Artistry	Performance assessment	• Project evaluation for problem-based learning • Jury for dissertation • Portfolio for competencies assessment

The Place of Portfolio Within the Curriculum

We regard the focus of higher education on skill or on savoir-faire as complementary. In our view this is a continuum with two poles: technical ability and artistry. This means that we assume that the curricula of higher education courses must make room for both visions. We are therefore not in favour of organizing higher education with too strong a bias towards either one of the two visions. In the past higher education may perhaps have been too one-sidedly aimed at knowledge transfer or skills instruction. Yet it does not seem wise to us to shift higher education one-sidedly to focus on artistry, either. Savoir-faire is only possible on the basis of a certain level of skill.

However, both visions do not need to receive equal attention at every moment of the course. It is advisable to emphasize particular aspects at particular stages. After all, the more students have at their disposal in terms of basic intellectual equipment the more possibilities they have of using this creatively. To a certain extent skill is a prerequisite to savoir-faire. Is it permissible to throw students in at the deep end at the start of the course without sufficient intellectual equipment, in the hope that they will be able to make sense of things with creative problem-solving capacity?

In our view it is better to concentrate on the teaching of basic knowledge and skills at the start of the course, in order to make more room for artistry towards the end of the course. If course directors opt for the integration of both visions when compiling the curriculum, they can gradually reduce the emphasis on technical ability as the course progresses in favour of artistry (see Figure 2). In line with our overall view we consider that examinations and skills tests have there most important function in the beginning of the course. Portfolio is more useful towards the end of the course when the students are ready to deal with more complex situations.

Portfolio is Not Suitable for All Types of Learning

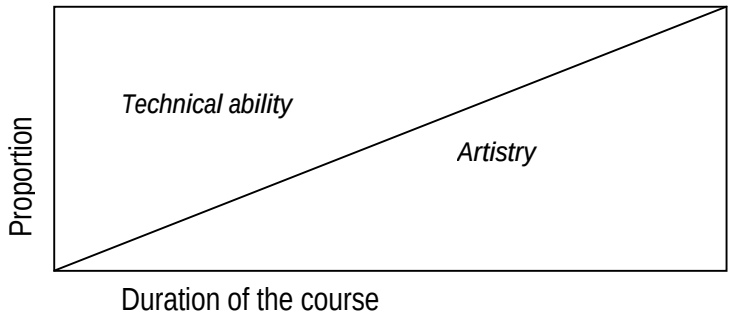
In the following paragraphs we set out our position with regard to the usefulness of portfolio for the supervision and evaluation of the various competencies for professionals. When considered in the light of the existing array of tools we see first and foremost that there is an important role for portfolio in the supervision and evaluation of learning competencies. With respect to profession-specific competencies we see that portfolio makes only a modest contribution.

Learning a Profession or Learning to Learn

While studying the many classifications of portfolio in higher education, we have arrived at a classification which merits universal recognition. In essence, portfolios in higher education can serve two different educational objectives: that of learning a profession and that of learning to learn. We call these portfolios aimed at profession-specific competencies and portfolios aimed at learning competencies. This distinction is of great value because there is a significant degree of difference between how portfolio is used for these two sorts of competencies. We will attempt to assess the value of these portfolios by placing this in the context of the existing array of tools.

Naturally students in higher education have to learn a profession. For the supervision and evaluation of profession-specific competencies higher education can fall back on an extremely wide range of methods and tools. This extends from the examination of educational content, training of skills in the educational setting by simulations and role playing, to the assessment of work experience placements. Higher education institutions have a considerable experience and expertise in this area. The question is, however, whether portfolio can offer any additional value above and beyond this. If we already have so many tools at our disposal, what can portfolio do that

FIGURE 2
Proportion of Technical Ability and Artistry Throughout the Duration of the Course



other tools cannot? In order to formulate an answer to this question, we will examine the shortcomings of the existing tools.

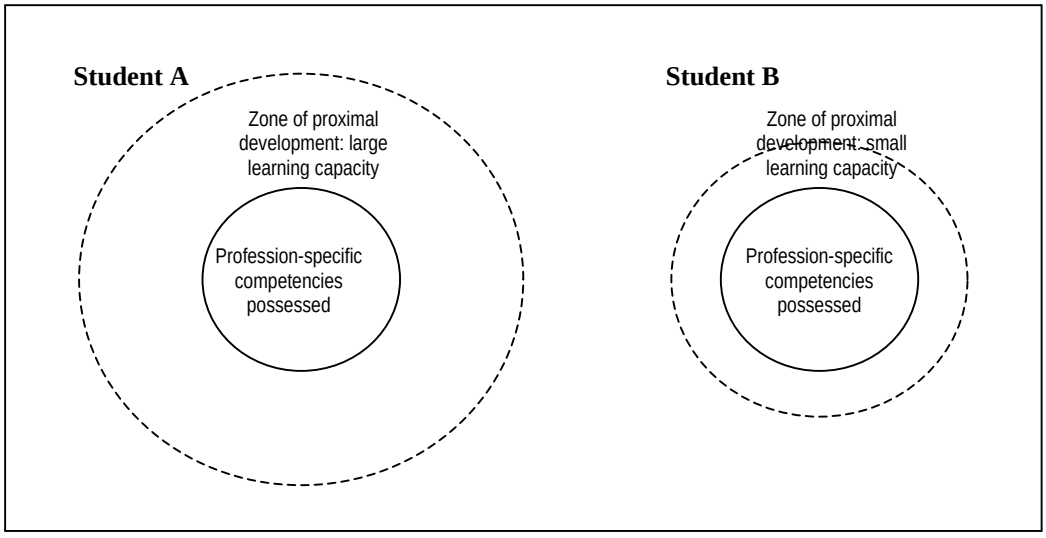
We see portfolio as a tool for indirect performance assessment. For this reason we will concentrate on the shortcomings which have been signalled with regard to the present tools for the supervision and evaluation of the work experience placement or when applied to open and practical assignments. Direct observation of the student's performance during his or her work experience placement may well be the most valid mode of evaluation. In many cases however, the resources and possibilities in this regard are rather limited. Yet the course instructor can form a picture of the student's performance using the work experience placement file, the information of personal tutors, etc. We believe that portfolio can play a supplementary role here. In a portfolio the student can provide an extensive documentation of his or her performance. In this way, the course instructor can get a better picture of the student's profession-specific competencies by using portfolio in combination with other tools.

However, the situation with regard to learning competencies, is somewhat different. By learning competencies we mean skills such as being able to work independently, the ability to plan, the capacity for reflection, being able to modify one's behaviour etc. In order to make the distinction between profession-specific competencies and learning competencies as clear as possible, we used Elliott (2003) as our inspiration. In his article he uses Vygotsky's (1978) concept of the zone of proximal development. Imagine two hypothetical students who at a particular moment possess the same quality profession-specific competencies (see Figure 3). Assuming that the quality of the supervision is the same for both students, student A will still be able to get more out of the learning situation than student B, given that the size of the zone of proximal development is a measure of the learning capacity of the student. Student A possesses more learning competencies than student B.

For instance, two student teachers are equally competent to start teaching after their initial course. In relation to there teaching competencies both have equal chances to be considered a good teacher. But society and science evolve. Which teacher is most likely to be a good teacher after twenty years? Most definitely the one who is able to adapt to the new situation. In other words, the teacher who is most capable of learning from his experiences and his environment, will keep a better position to be successful.

Since the importance of life-long learning has permeated through into higher education a great many courses now pay more explicit attention to learning competencies (Foote, 2001). Even so, for the time being, higher education cannot fall back on such a rich tradition with regard to the supervision and evaluation of learning competencies as it can in the case of profession-specific competencies. The supervision and evaluation of learning competencies is not a simple matter and we need to bear in mind that the learning process always occupies a certain period of time. The existing array of tools is rather limited and characterized by being very labour intensive. We have in mind monitoring through personal contact (such as in the master-apprentice relationship) and supervision (Stevens et al, 1998). Questionnaires for the self-reporting of learning competencies, interviews, techniques such as thinking aloud and tools such as logbooks yield additional

FIGURE 3
Differences in Learning Competence Where Profession Specific Competence Is Equal



information, but can pose problems with regard to their reliability. There is sometimes a very high chance of receiving socially desirable answers if self-reporting is used as a source of information as part of evaluation by third parties. A combination of tools is, of course, also possible.

Here portfolio serves as a powerful tool that can be used both on its own as well as in combination with other tools for the supervision and evaluation of learning competencies (Meeus & Van Looy, 2002). Portfolio offers outstanding possibilities of tracking and adjusting the student's learning process. It permits the student to show long term processes. Going through a portfolio is certainly labour intensive (Viechnicki, 1993; Evelein & van Tartwijk, 2000), but this is also true of the other tools. Moreover, all kinds of materials can be included in a portfolio such as questionnaires for self-evaluation or evaluation by others. The fundamental principle underlying portfolio aimed at learning competencies is to foster a self-directed learning process. Portfolio can play a prominent role in the supervision and evaluation of learning competencies. Evolutions in practice fit in with this point of view. In general, portfolios aimed at learning competencies seem to have more to offer than portfolios aimed at profession-specific competencies (Inspectie van het Onderwijs Nederland, 2003, p.16).

Incompatibility of Evaluation

We believe that there is a fundamental difference between the use of portfolio to demonstrate profession-specific competencies and portfolio to demonstrate learning competencies. In both portfolio types different materials are selected. In portfolio aimed at profession-specific competencies the student selects his or her best work. After all, the quality of the work is being judged. On the other hand, in portfolio aimed at learning competencies the student selects work that represents his or her learning process. Not the quality of the work but the quality of the learning process is being judged. Learning competencies can be demonstrated by revealing the different phases of a learning process. A learning process consists mainly of four phases: choosing one or more learning components, draws up a personal learning plan, carrying out the plan and reflecting on the results. Moments of failure may just be very interesting for this purpose.

Is a combination of the two sorts of portfolios in a single portfolio possible or desirable? We do indeed see organizational possibilities of combining the two sorts of portfolios. This allows the student to create a portfolio archive and to select and present material, as the course directors desire, for the evaluation of profession-specific competencies or learning competencies. However the combined evaluation of profession-specific competencies and learning competencies by the same evaluator is not desirable! In this event, the student is required to show him or herself in his or her best light, but at the same time it is assumed that the student will record qualitatively effective reflections. This means in fact that the course directors are asking the student to show both his or her strengths and weaknesses in order then to judge the student on his or her weak competencies at the same time. The chance of unreliable reflections in that case is very high (Meeus et al, 2005a).

In practice we often see many examples of portfolios where the evaluator considers both profession-specific competencies as well as learning competencies. Students are usually quick to spot this and to develop strategies for turning this problematic situation to their advantage (Meeus et al, 2005b). They avoid genuinely opening up and reduce their weak competencies to a few harmless learning components. The reflections degenerate into exercises in tactical writing to convince the evaluator of their brilliant achievements. At the same time students invent a few non-risk defects in order to show that they are nonetheless capable of adopting a critical attitude with regard to their own performance.

Evaluation methods should be chosen according to the objectives which they are intended to achieve (Van Petegem & Vanhoof, 2002, p.46). If the course directors opt for a portfolio aimed at learning competencies, the student should be allowed to report his or her learning process in a safe context. In that case there is little risk for unreliable reflections. If the course directors opt for a portfolio aimed at profession-specific competencies, the student should be allowed to select his or her best work. In that case there is a considerable risk for unreliable reflections, certainly when there is a lot at stake for the student. Students will not be eager to reveal there failures (Smith & Tillema, 1998).

Conclusion

In order to make sense of the portfolio landscape, we have distinguished between four modes of implementation of portfolio in, and in relation to, higher education. In chronological order these range from the use of portfolio in admissions to higher education, during the higher education course, on entry into the profession and for ongoing professional development.

There is a tremendous diversity of portfolio types in use in higher education courses, which manifests itself in a large number of applications. We have also observed a large number of classifications, yet there is still no universally accepted classification for portfolios in higher education. A classification which we regard as worthy of universal acceptance is one that can distinguish between portfolios aimed at profession-specific competencies and portfolios aimed at learning competencies.

We have made a number of observations regarding present portfolio applications. Portfolio

only really comes into its own within a particular educational vision, namely that of the education focused on artistry. We regard technical ability and artistry as complementary educational elements which both deserve attention in higher education. We have argued that to a certain extent skill precedes savoir-faire, which leads us to conclude that portfolio can best be used at the end of the course.

We argued that in higher education portfolios aimed at profession-specific competencies yield a limited added value because they only provide supplementary information compared to other and sometimes better tools. Portfolio aimed at learning competencies can add genuine value in higher education because there are currently few other and better tools for supporting and evaluating the student's learning competencies. If we want our graduates to be not only professionally competent, but also to be capable of continuing to learn on a life-long basis, the introduction of a portfolio of this kind is the recommended choice. The assessment of profession-specific competencies and learning competencies by means of portfolio by the same evaluator is to be strongly discouraged as it is highly prejudicial to the reliability of the reflections.

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Three Steps to Teaching Abstract and Critique Writing

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The instructional model presented is based upon the premise that abstracts and critiques are initial stages of scholarly writing. The pedagogy described is grounded in principles of effective lesson planning, instruction, and evaluation techniques. Step 1: 'Laying the Foundation' describes how to teach students the difference between 'good term paper' writing and scholarly writing. Step 2: 'Communicating Expectations and Evaluation Criteria' presents the content and use of guidelines and rubric. Step 3: 'Scaffolding for Success' outlines the use of journals, peer review, specific instruction, and resources. Initial students' success and positive feedback suggest that this instructional model has merit.

Many graduate students enter their programs with basic writing capabilities and the ability to comprehend and summarize journal articles (Buck & Hatter, 2005; Granello, 2001; Harris, 1997, 2005). Generally speaking, these students are able to relate the literature to their own experiential knowledge and offer their opinions. However, some students are not successful writers which may mask or thwart their critical thinking skills. For these students, specific instruction is essential and may need to begin at a writing lab. Both students and faculty assume that undergraduate writing skills will easily transfer to the graduate level performance (Buck & Hatter, 2005; Granello, 2001; Harris, 1997, 2005). Typically, the majority of students produce work at a beginning graduate level, not at a polished scholarly writing quality.

Unfortunately, these basic capabilities do not necessarily translate into scholarly writing skills. Why? First, within baccalaureate programs students are expected to master writing 'good term papers' that demonstrate comprehension and the ability to articulate opinions. However, a significant difference exists between scholarly writing style and term paper writing style. This difference creates a struggle for students and necessitates instruction from professors. Second, as beginning graduate students attempt to articulate the depth and breadth of their understanding, they frequently become immersed in jargon, fragmented ideas, unsupported opinions, and a disorganization 'fog' (Buck & Hatter, 2005; Granello, 2001; Harris, 1997, 2005). Fearful that they will leave an important point out, they spill every thought on the page. Ironically, the old adage 'less is more' applies to scholarly writing. The impact of unsuccessful writing cannot be fully measured, but it certainly includes frustrated instructors and discouraged students. We can speculate that, when students' writing stagnates, so do their critical thinking abilities. The premise of this article is that, by providing specific instruction to address abstract and critique writing, students will enhance their scholarly writing and critical thinking abilities. Generally speaking, graduate courses require a research project for the purpose of increasing critical thinking abilities. Graduate projects may vary from abstract writing and critique writing to literature reviews or research proposals. In graduate teaching, I found myself frustrated with the quality and variance of my students' writing skills. Additionally, I was concerned that students were not connecting to critical principles.

Literature Review

So how do we teach the elusive scholarly writing style? First, let us consider that scholarly writing has several different learning stages or developmental levels that build upon each other. This author conceptualizes the stages as the following: abstract writing, critique writing, literature reviews, research/grant proposals and reports, and journal articles. These stages easily fit into Bloom's Taxonomy (Bloom et al., 1956), a useful description of learning hierarchy and a well proven pedagogical tool (Granello, 2001). Abstract writing requires knowledge and comprehension, the beginning levels of Bloom's Taxonomy (Bloom et al., 1956). An abstract is defined as "a brief, comprehensive summary of the contents of the article" (American Psychological Association, 2001, p.12). The ability to comprehend and summarize an article is foundational in all fields of study.

Critique writing includes the higher levels of Bloom's Taxonomy (Bloom et al., 1956): knowledge, comprehension, application, analysis, synthesis, and evaluation. A critique differs from an abstract in that it includes student's opinions, while the abstract does not (White, 2004). Within a critique, students analyze the article's clarity, organization, purpose, research methodology, findings, and recommendations. Additionally, students are expected to link their analysis to their field-based experiences. One could argue that both "summaries" and "critiques" are discipline specific; however it is not within the scope of this article to delineate those differences. The proposed

instruction model attempts to present a design that can be appropriately modified to meet the needs of various disciplines.

Abstracts and critiques are building blocks for more complex writing such as literature reviews, journal articles, and research/grant proposals and reports. A literature review demands expansion of the understanding of several articles into knowledge, application, analysis, synthesis, and evaluation of ideas. Journal articles and research/grant proposals and reports include comprehensive literature reviews. Abstracts, critiques, and afore mentioned scholarly writing products must be objective, organized concise yet comprehensive and formal (Hacker, 2003; Henson, 1999). Skills used for abstract and critique writing are integral components of scholarly writing. Thus, this author hypothesizes that increased attention to the development of abstract and critique writing skills provides the foundation for improved scholarly writing and enhances students' critical thinking abilities.

University faculty members often express concern about graduate students' scholarly writing (Buck & Hatter, 2005; Harris, 2005). Students express their frustration that they don't understand the expectations. The assumption that students who have completed undergraduate work will be able to transfer those skills into scholarly writing fails students and faculty (Buck & Hatter, 2005; Granello, 2001). Another misjudgment made by both faculty and students is the assumption that writing automatically leads students to accomplish critical thinking skills (Granello, 2001). Froese, Gantz and Henry (1998) suggest that the gap between "expectation and performance may arise from instructional deficiencies" (p. 103). A literature review reveals many topics such as training, conducting literature searches, learning to read and understand research, and writing in American Psychological Association format (Redish & Racette, 1979; Jeske, 1985; Jones & Steinber, 1987; Haswell, 1989; Oliver, 1995). The current literature does not tend to address instructional techniques with Granello's (2001) work being the exception. Granello believes that the assumption that definitions and examples are sufficient instruction fails both students and faculty. Granello (2001) recommends that Bloom's Taxonomy of Educational Objectives (Bloom et al., 1956) be used as a pedagogical tool to promote cognitive complexity in graduate writing. Granello found that graduate students achieved cognitive complexity in literature reviews when they had a clear understanding of the desired outcomes.

Piercy, Sprenkle, and McDaniel (1996) emphasize that graduate students learn best by "being supported, engaged, and challenged. They also learn best when the have good models, opportunities to practise and receive feedback" (p.164). Designing instruction rich learning environments is the inherent challenge for every educator. Scaffolding is the effective instructional design that weaves together a sequence of content, materials, tasks, and supports to optimize learning (Dickson, Chard, & Simmons, 1993; Larkin, 2001). The application and effectiveness of scaffolding instruction is addressed in the literature found across disciplines and age levels including adult learning (Kao & Lehman, 1997; Larkin, 2002; Tabak, 2004). Additionally, scaffolding is viewed as a vehicle to accommodate the needs of diverse learners (Kame'enui, Camine, Simmons, & Coyne, 2002; Kirk, Gallager, Anastasiow, & Coleman, 2006; Palinesar, 1998; Salend, 2001; Stone, 1998). Larkin (2002) describes two essential elements of scaffolding instruction as engage students in establishing and actively pursuing a goal. Achievement of the goal is facilitated by "actively diagnosing student needs and understandings, providing tailored assistance and specific feedback, and controlling for frustration and risk (Larkin, 2002). Tabak delineates "synergistic scaffolds" as a pattern "which refers to multiple co-occurring and interacting supports for the same need" (2004, p.307.). Within Tabak's discussion of patterns of scaffolding, she emphasizes that the consideration of the demands of the learning task are an essential component of constructing the puzzle (2004). This proposed instructional model considers the demands of the learning task and uses a synergistic scaffold to achieve the goal of improved graduate writing.

An Instructional Model

The 'Three Steps to Teaching Abstract Writing and Critique Writing Model' is a unique combination of (a) recognizing that abstract writing and critical writing are initial stages within scholarly writing; (b) scaffolding instruction; and (c) believing that adult learners need support, engagement, and challenge (Piercy et al., 1996).

The purpose of this model is to improve graduate students' writing. This model was developed over several semesters within my special education and educational administration graduate courses. In the process, my students improved their abstract writing and critique writing skills and reported transfer of their scholarly writing skills to other graduate courses (Harris, 2004a).

The Three Steps to Teaching Abstract Writing and Critique Writing model follows principles of effective lesson planning, instruction, and evaluation techniques. The three steps are (1) Laying the Foundation, (2) Communicating Expectations and Evaluation Criteria, and (3) Scaffolding for Success. Application of this instructional model early in the semester gives students the tools to refine their writing

skills throughout the course.

Step One: Laying the Foundation

The first step of the model evolves by connecting students' knowledge and previous experiences in writing to the challenge at hand and by setting goals and objectives. Identifying the learning goals and objectives creates a concrete foundation for learning. The strength of the foundational cement depends upon connecting to students' prior knowledge and experiences and building upon that base. The goal is to improve scholarly writing. The objectives are to learn abstract writing and critique writing.

Connecting to Prior Knowledge and Experience

Through discussion, students are familiarized with the concept of scholarly writing by comparing it to 'good term paper' writing style. The essential elements of that comparison are that scholarly writing is more formal, more objective, more concise, yet comprehensive, and linear in its organization. Typically, this open and frank discussion leads students to share their experiences; frequently, they express their dismay at not understanding the expectations for the elusive scholarly writing style. Indeed, I remember the agony of a three hour negative review of my first scholarly paper and the defeat of leaving the Professor's office not understanding the expectations. Another graduate student enlightened me: "…[scholarly writing] is brief but comprehensive. It's linear and like journalism so you tell who, what, where, when, and how. Just the facts! Save your opinions!" After sharing my experience, students seem to appreciate the shared learning struggle and straight-forward advice. Then we are ready to move forward to meet the goal.

Setting Goals and Objectives

Adult learners are particularly concerned with the relevance of what they are expected to learn (Knowles, Holton, & Swanson, 1998). Many graduate students will instantly and emphatically state they are not interested in writing grants, articles, or research. Some see writing as another 'hoop to jump through' on the way to graduation. Some will accept scholarly writing as a goal because it contributes to their course grade. Many are interested because these skills will enhance their success in other courses (especially the intimidating required research course). Of course, there are students who are deeply committed to learning and believe that the process of writing contributes to their learning and future professional success (Harris, 1997, 2005).

After accepting the goal and objective, the class explores specifics. The purpose and style of abstracts are explained. "An abstract is a brief, comprehensive summary of the contents of an article" (American Psychological Association, 2001, p. 12). An abstract informs the reader about the article and should address six components of the article: purpose, scope, method, results, recommendations, and conclusions (Kies, 2004). Students should be reminded to answer the journalist questions: who, what, where, when, how, and why. Next, the differences between an abstract and a critique are addressed. The abstract is the summary while a critique includes supported opinions and analysis (White, 2004). For the critique, students should be advised to address the following questions: (a) what is the value of the information represented in the article? (b) how does this article relate to my own experiences and beliefs? and (c) how does this article relate to the course frameworks?

Teaching students to differentiate abstracts from critiques helps them to recognize the need to direct changes in their writing style. A class discussion of the questions to be addressed helps students see the differences between abstracts and critiques. Understanding that brevity and clarity are essential for both the abstract and critique is a beginning step towards accomplishing concise writing. Further support and practice addressing 'how to' write concisely are imbedded in this instructional model.

Step Two: Communicating Expectations and Evaluation Criteria

Communication of expectations and evaluation is the cornerstone of success (Buck & Hatter, 2005; Harris, 2005; Granello, 2001; Jones & Steinberg, 1987; Larkin, 2001, 2002). To ensure that students understand, the instructor presents the assignment guidelines and the evaluation rubric. During the first class, hardcopies of the guidelines and rubric are provided and time is allotted for students' questions.

Guidelines

Often in graduate courses, the syllabus is the main descriptor of written assignments and research projects. Instructors explain the tasks and answer questions in class, yet many students report they do not fully understand the expectations and their work fails to meet assignment criteria. To address this problem, specific detailed guidelines beyond the syllabus should be developed and shared with students. For each of my courses, the guidelines address three components: general description of the assignment, format, and content. For example, "Guidelines: Abstracts and Critiques" delineate

FIGURE 1
Guidelines: Abstracts and Critiques

Topics and journals:

Students will complete ten abstract/critique assignments. The first assignment will be completed using an article provided by the instructor. For the other nine assignments, students are expected to locate and use articles from the following professional journals:

Exceptional Children
Teaching Exceptional Children
Learning Disabilities Research & Practice
Behavioral Disorders
Journal of Early Intervention
Young Exceptional Children

Format:

- Use single space for the following information: your name, date, and course number on one line; second line identify the article by using **APA referencing format.**
- Must be typed, double spaced, pages numbered and stapled, 12-point font with 1-inch margins.
- Correct grammar, spelling, and punctuation are expected.
- Staple Abstract/Critique to a copy of the journal article.
- NO title pages or folders needed!
- REMEMBER: In special education professional writing includes the use of non-labeling language.

Content:

Abstract:

- Use the word "Abstract" in bold as a heading.
- An abstract is a summary written in a scholarly writing style that represents a thorough comprehension of the article.
- The text of your abstract should be 100 to 150 word count.
- Six components to include
  - Purpose
  - Scope
  - Method
  - Results
  - Recommendations
  - Conclusions

Critique:

- Use the word "Critique" in bold as a heading.
- This section should be one full page.
- A critique is your professional judgment and analyses of the article and should include:
  - Your opinion as to clarity and organization
  - Your opinion as to the validity of the research methodology and results
  - Analyses that relate article to course content and/or other research
  - Analyses that relate article to your experiences in the field
  - Analyses that relate article's premises to 'course frameworks'
- 'Course frameworks' are Turnbull's "Values to Guide Teaching."

assignment details in three sections: (a) topics and journals, (b) format, and (c) content (See Figure 1).

Topics and journals. In this section of the guidelines, the instructor sets parameters by describing general topics, number of articles, and specific professional journals to be used. If the instructor chooses to limit the types of journals and topics, students can focus on the assignment; conversely, if the instructor choices to broaden the scope of journals and topics students' horizons are expanded. These decisions will vary from course to course. Topics may be linked to larger research projects and require instructor's approval.

Format. In this section of the guidelines, the instructor explains that students are to use American Psychological Association (APA) format and describes acceptable headings, line spacing, font, margins, length, and other requirements. For example, it is helpful to require students to submit copies of the article that they have highlighted. This provides the instructor with easy access to read the article and check for plagiarism. From my experience, taking valuable class time to explain format details, beyond just "use APA," eliminates confusion for students and gives them confidence.

Content. In this section of the guidelines, the instructor addresses general and specific requirements for the abstract and critique. The guidelines state that professional writing includes correct grammar, spelling, and punctuation because an articulated expectation is more likely to be achieved. Additionally, this section of the guidelines should address specific professional writing criteria that are germane to the academic field. For example, in special education non-labeling language is a current standard; therefore, a brief explanation and written examples of non-labeling language are provided.

Next, the guidelines should delineate the abstract content and the critique content. The directions for the abstract content are simple. Students must create a concise summary that represents a thorough comprehension of the article. In contrast, directions for the critique content are detailed. First, these directions explain that in the critique the students should discuss their opinions, analyze the article's content and research, synthesize their learning, and relate the article to their experiences and the "course frameworks." Second, the critique directions should emphasize that opinions and analyses need to be substantiated. After reviewing the guidelines, the instructor should present the "course frameworks" and explain that students are to these to analyze the article.

Frameworks. A course framework is a principle or a set of principles that the course is built upon such as a conceptual model, code of ethics, or belief statements (Harris, 2005). A carefully selected framework takes the learner past trivial mechanics into critical thinking and provides a catalyst for their analysis. Essentially, core course frameworks are the principles that an instructor selects for emphasis. More than one framework may be appropriate for some courses. For example, in my special education courses I use "Values to Guide Teaching" (Turnbull, Turnbull, Shank, & Leal, 2002) as a framework. In a graduate course that prepares educational administration majors to work with students with disabilities, I use two frameworks: "Levels of Principle-Centered Leadership" (Covey, 1990) and "Values to Guide Teachers" (Turnbull et al. 2002).

In special education we encourage university students to understand and embrace the 21st century paradigm that individuals with disabilities are entitled to full participation and citizenship in our society (Turnbull et al., 2002). This paradigm, which promotes the philosophy of inclusion, proposes a set of belief statements entitled "Values to Guide Teaching." These values include a description of six components of an inclusive philosophy: (1) Envisioning Great Expectations, (2) Enhancing Positive Contributions, (3) Building on Strengths, (4) Acting on Choices, (5) Expanding Relationships and (6) Ensuring Full Citizenship. I believe these values challenge students to expand their paradigms and operationalize their inclusive philosophy (Harris, 2005).

For my course in education administration, Turnbull's values challenge educators to expand their views of special and general education, as well as change their expectations for teachers and staff. Since graduate courses in educational administration focus on leadership skills, Covey's Levels of Principle-Centered Leadership is an appropriate framework. In particular, the combination of these frameworks force students to (a) thoughtfully examine their values and principles, (b) crystallize their leadership style, and (c) develop an inclusive paradigm (Harris, 2005).

From this author's perspective, the selection of frameworks for my courses enabled me to define and articulate the paradigms, values, and principles I hoped to teach. First, the instructor should carefully select course frameworks and provide written and oral explanations to students. Second, the instructor should require students to reflect, relate, and synthesize the frameworks with other concepts and information in their written work and class discussions. Instructors may require students to discuss all components of the course frameworks or to select several significant components for their written discussion (Harris, 2005).

Evaluation Criteria

All too often at the graduate level, communication of the evaluation criteria and process is vague. Students want to know what the assignment is and how it will be evaluated. The combination of clear guidelines and an evaluation rubric creates a win-win situation for both the students and instructor.

Constructing the rubric. Instructors should use the guidelines to construct the evaluation rubric. A parallel construction of the guidelines and rubric ensure that

assignment details are consistently communicated to students (See Table 1). From "Guidelines: Abstracts and Critiques", I developed the following basic evaluation categories: Format, APA Format, Professional Writing, Comprehension and Articulation, Scholarly Writing Style, and Critique. Next, the instructor must decide whether to use a quantitative or qualitative rating scale, or a combination. I believe that qualitative rating scales assist students in achieving the assignment criteria. For this holistic rubric, the rating scale includes Beginning, Developing, Accomplished, and Exemplary. For each of the categories there is a qualitative definition for each of the four possible ratings. The rating scale for the Scholarly Writing Style category is different from the other categories (See Table 1). First, a quality definition for Exemplary is given, but the lower ratings (Beginning, Developing, and Accomplished) are combined into "Areas to Improve." The purpose of this unique rating scale is to delineate specifics aspects of scholarly writing that the student should examine.

Using the rubric. The rubric is used several times within this instructional model. During the first class, the instructor presents the rubric and describes how it will be used. First, students are encouraged to check their work with the rubric. Second, the rubric is used for a peer review of Assignment #1. Finally, the instructor uses the rubric to evaluate and give feedback for subsequent assignments. The advantages of using a rubric are a clear communication of the evaluation criteria, less grading time, more consistent objectivity, and more specific feedback.

Refining the rubric. At the end of each semester, the instructor should refine the guidelines and rubric. Miscommunications and/or learning gaps can be addressed by clarifying the guidelines and improving the rubric. From my experience, this on-going refinement process contributes to increased student success from semester to semester.

Step Three: Scaffolding for Success

Scaffolding instruction is an effective teaching strategy that, in this author's opinion, should be used from preschool to graduate school. The design of Assignment #1, instruction sequence, and evaluation process are woven together. As a whole these elements create the 'steel' frame upon which students' learning is enhanced.

Assignment #1

As described earlier, the instructor presents the guidelines, evaluation rubric, and frameworks to the students during the first class session. A specific article is given to students for Assignment #1 and their first draft is due next class. Students are assured that there will be additional instruction and that, after peer review, they will have the opportunity to refine their first draft.

Article selection for Assignment #1. The appropriateness of the first article is a key factor to success. Two pedagogical decisions must be made: (a) topic and source of article and (b) whether to use one article or several different articles. The first pedagogical decision is selecting an appropriate topic that focuses students on important course content. The instructor should select a topic that sparks students' interests, contributes to their foundational knowledge, and lays groundwork for future course content without overwhelming students. The topic should contribute to the foundational content. For example, my special education course focuses on inclusion; therefore, inclusion articles from *Teaching Exceptional Children* are used. In my educational administration course, the first unit addresses abuse/neglect and safe schools; therefore, articles from *Educational Leadership* about bullying are selected. Thoughtful topic selection and attention to the difficultly level of the article[s] used for Assignment #1 contribute to student success. The instructor should review the effectiveness of the article[s] each semester, modifying and updating as necessary.

Number of articles for Assignment #1. The second pedagogical decision is the number of articles to be used for Assignment #1. This can be approached in two different ways: (a) the same article is given to every one or (b) three or four different articles are randomly distributed. Each approach has advantages and disadvantages. Finding one article for the entire class is easy; however, the students may collaborate too much or their writing becomes so similar that they fail to recognize individual problems. Finding several articles and allotting more class time can be a challenge. Multiple articles provide opportunities for further discussion or additional peer reviews. The multiple-articles approach immerses students in the foundational topic and the literature. The instructor can choose to frame the nature of the discussions or allow the discussions to evolve differently within each group. The timing of these additional discussions is critical. After experimenting with the timing of the discussion from semester to semester, I have found that students can focus on sharing their articles best after the peer review. The unexpected benefit is that students feel that their written assignment enhanced their understanding of the topic and wasn't just another exercise.

APA mini-lesson for Assignment #1. Novices to APA (2001) are easily confused and struck with APA phobia. Before students write their first draft, instructors should present a quick lesson on APA

referencing. In lieu of a title page, students are directed to place the APA reference above the abstract. A simple demonstration explaining APA referencing calms students' fears. Students typically make errors such as using first names of authors, capitalizing the article title, or omitting commas. Another point that escapes students is that, generally speaking, they should not use citations within an abstract (Harris, 2004b). Students mistakenly believe they must quote and cite the very article they are writing about within the abstract (Harris, 2004b). Finally, provide information as to where students can find the current APA book, APA website, or on-line services that automatically produce APA references.

Lesson

By the third class meeting students have a starting point, their first draft, and the following lesson provides a pathway for improvement. This lesson includes an extensive peer review, a presentation of sample rewrites, and resource materials.

TABLE 1
Evaluation Rubric: Abstracts and Critiques

Criteria	Rating Scale			
	Beginning	Developing	Accomplished	Exemplary
Format	Incorrect margins, font, headings, insufficient length, copy of article omitted.	Several errors in format or headings, sufficient length, and included copy of article.	Minor errors in format or headings, sufficient length, and included copy of article.	Correct margins, font, headings, sufficient length, and included copy of article.
APA Format	Three or more errors in APA format of the reference.	Two errors in APA format of the reference.	One error in APA format of the reference.	Correct use of APA format of the reference.
Professional Writing	Three or more errors in grammar, spelling, &/or punctuation.	Two errors in grammar, spelling, &/or punctuation.	One error in grammar, spelling, &/or punctuation.	Correct grammar, spelling, &/or punctuation.
Comprehension & Articulation	Summary covers several points but lacks objectivity &/or accuracy. Includes some misinterpretations. Needs more clarity in the articulation.	Summary covers main points accurately but lacks objectivity. Includes some main points and supporting details, need to be more concise. Needs more clarity in the articulation.	Summary covers main points accurately & with objectivity. Includes main points and supporting details, need to be more concise. Clearly articulated.	Thorough yet concise, objective, and accurate summary. Includes main points and supporting details, yet concise. Clearly articulated.
Scholarly Writing Style	Areas to Improve: Vocabulary: unnecessary words; repetitive; too simplistic/informal; use terms from article; avoid pronouns/use precise nouns. Phrases/clauses: eliminate prepositional phrases; use adjectives/adverbs & precise nouns/verbs to replace phrase Sentences: combine sentences; combine ideas; use parallel clauses; use listing; write in positive format.			Scholarly writing style throughout the assignment. Concise and positively written.
Critique	Includes simplistic, general statements that are not substantiated or supported.	Includes some analytical statements that relate article to course content &/or real-life problems.	Includes some analyses that relate article to course content &/or real-life problems.	Includes several analyses that relate article to course content, real-life problems, &/or other research. Analyses are presented in a logical conceptual strong organization.
	Does not include statements that relate article to the course 'Frameworks.'	Includes vague or weak statements that relate article to the course 'Frameworks.'	Includes relevant statements that relate <u>implicitly</u> article to the course 'Frameworks.'	Includes relevant statements that <u>explicitly</u> relate article to the course 'Frameworks.'

Peer review. Each peer review group should have three to five people. If using the same article for the entire class, ask students to form review groups. If using several different articles, ask students to form review groups in which everyone has the same article. Next, students exchange Assignment #1 and complete a peer review using the guidelines, rubric, and tip sheet (See Figure 2). Peer reviewers can scrutinize the abstracts and critiques for clarity, comprehension, and thoroughness because reviewers already know the article's content. The instructor explains the peer review process and guides students through each step, one at a time. Using the rubric the peer review process includes the following four steps:

1. Check for accuracy of APA reference.
2. Check format details using the guidelines.
3. Read and evaluate for overall content.
    - Does the content represent an understanding of the article?
    - Does the abstract thoroughly cover the article?
    - Does the critique offer substantiated opinions and/or analyses?
    - Does the critique relate the article to writer's experiences and to frameworks?
    - Is the writing clear to the reader?
4. Provide specific feedback (written on draft and explained verbally).
    - Use "Tip Sheet".

The effectiveness of the peer review is partially evident in students' questions and comments during the process but most significantly in the differences between first and second drafts. The instructor should require that both drafts and the peer review rubric be submitted. From these, one can identify problems within the peer review process, and therefore refine techniques to lead students to more effective peer reviews.

Presentation of sample rewrites. To emphasize rewriting techniques, the instructor should present examples from student abstracts followed by the corrective rewrite (See Figure 3). I highly recommend developing a set of sample rewrites because the process helps identify typical errors made by students. I have found that presenting sample rewrites both visually and orally to give students a feel for the flow of scholarly writing. As we work through the examples students are asked to identify techniques represented in the rewrite samples from the "Tip Sheet." In my experience, students' responses to this sequential approach have always been positive with comments such as "Now I get it" or "So that's what you mean."

Resource materials. Following the presentation of sample rewrites, the instructor should provide students with resources to support editing. For example, charts from Henson's (1991) chapter "About Style" clarify both the editing process and specific areas for improvement. These include:

- "Writing Positively" (p.47).
- "Good Editing is A Step-by-Step Process" (p. 49).
- "Replacing Long Expressions with Fewer Words" (p.52).
- "Writers Should Use Small Words" (p.53).

On-line resources or discipline specific resources should be provided.

Evaluation Process

The evaluation process is built around the rubric and several layers of feedback. The most extensive evaluation should center on Assignment #1, in the hopes that these layers of feedback have instructional value. Peer reviewers provide the first feedback layer for Assignment #1. Students generally consider this a risk-free opportunity to get corrective feedback and appreciate the chance to refine their first draft. The exchange of ideas and time to ask the questions are invaluable. The second draft is evaluated by the instructor using the rubric. The instructor then gives detailed written suggestions that demonstrate improvements in organization, vocabulary, use of phrases/clauses, and sentence structure. At this point, students greatly appreciate one-on-one coaching in which the instructor explains written suggestions before students write their final draft. The time invested in written feedback and coaching sessions ensures greater student success. I have found that this approach has actually shortened the time spent on grading. All subsequent assignments are evaluated with the rubric, which is accompanied by specific written feedback.

Summary

The Three Steps to Teaching Abstracts and Critiques instructional model includes (1) Laying the Foundation, (2) Communicating Expectations and Evaluation Criteria, and (3) Scaffolding for Success. Step One: Laying the Foundation starts students in the right direction by connecting to prior knowledge and helping students set goals/objectives. Step Two: Communicating Expectations and Evaluation Criteria includes a review of the guidelines and the rubric. Step Three: Scaffolding for Success uses demonstration of APA referencing, peer review process, and extensive instructor feedback to guide students through the refinement of Assignment #1.

FIGURE 2
Tip Sheet

Rewrite: mastery…improves learning and clarity.
Type-Os & misspelling: Only humans make these errors, but they are less forgivable in the age of computers and spell check.

Professional writing style:

- Language of the article…jargon the professional way
    1. Don't be afraid to use the phrases and terms used within the article.
    2. Double check the terms used in the article's abstract, article's summary or conclusion, and the Eric's abstract.
    3. Caution…..don't plagiarize!
    4. If a term needs to be explained….explain it!
- A thesaurus can be your best friend!
    1. Look for repetition of a word or phrase within your first draft.
    2. Ask yourself what other word or phrase could you use.
    3. Use the thesaurus!
- KISS….Keep it short & sweet!
    1. Look for ways to use the positive verses the negative.
    2. Focus on the educational implications.
- What are you trying to say??????……Say it more concisely!
    1. Combine sentences.
    2. Combine ideas.
    3. Use parallel clauses.
    4. Use listing within a sentence.
    5. Eliminate prepositional phrase after prepositional phrase after prepositional phrase.
    6. Ask yourself if you could say the same thing by using an adjective and precise noun.
    7. Avoid pronouns and say the real subject/noun.

Try it on for size and look at it more than once!

1. Write a rough draft…or start with an outline…just get the words and ideas down on paper.
2. Examine the way you wrote it looking for ways to improve, shorten, and clarify!
3. Compare to the article abstract, ERIC abstract, article summary/conclusion to make sure you haven't left out anything important and have used the professional language.
4. Take a short break and come back to it then read it out loud.
5. Experiment with different sentence structures and see which you prefer.
6. Proooofff REEEEaD it one---I say one more time!!!!!!!!

Conclusion

Scholarly writing skills do not develop automatically. Students struggle with the transition from writing 'good term papers' to graduate level writing. If we address scholarly writing in stages and provide effective instruction to meet students' learning needs, it can be a win-win situation for students and instructors. A wise saying in special education is equally applicable to graduate school: "Start where the student is; and take him where he needs to go."

The instructional model presented is based upon the premise that abstract and critique writing are initial stages of scholarly writing. This model is grounded in the belief that adult learners need to be supported, engaged, and challenged. Adults learn best when they can see the relevance of their learning goals and objectives. This instructional model is built upon the principles of effective teaching: connecting to prior knowledge, clear communication of expectations and evaluation, scaffolding instruction, opportunities to practice, and constructive detailed feedback.

With this model, I have found that students acquire a better understanding of the complexities of graduate writing and specific strategies to achieve the goal. Prior to implementing this model, students complained that they did not understand the intricacies or expectations for scholarly writing. During the initial development of this model, one student shared her enthusiasm: "Everything you taught us about writing has really helped me with the grad research class, the one class I was so afraid of."

FIGURE 3
Sample Rewrites

Example #1
"The law offers no guidance as how to determine the different of the two categories. There have been not law suites to set precedence in this matter. What is offered is a list of opinions given by experts in the filed of special education. The author of this article warns the reader…"
(52 words)

Rewrite:
"The law offers no guidance as to distinguishing the two categories, nor have the courts established precedence. Weinberg summarizes expert opinions which delineate socially maladjustment from severely emotional disturbance. The author cautions readers…" (33 words)

Example #2
"Fours categories of seizures: simple partial, complex partial, absence, and generalized tonic-clonic seizures are defined to give the teacher the ability to recognize the type of seizure occurring in the classroom." (31 words)

Rewrite:
"Four categories of seizures: Simple partial, complex partial, absence, and generalized tonic-clonic are defined to give the teacher the ability to recognize and record specific observations." (26 words)

Example #3
"Each of the children was given a battery of language tests and were taught 12 novel words. Each child's production and comprehension of these novel words were assessed. The brain injured children scored below controls on all language aspects." (39 words)

Rewrite:
"Language assessments revealed that children with brain injuries scored lower than the control group on production and comprehension of novel words." (21 words)

Note: Underlined term breaches writing standard addressing non-labeling language in the field of special education. Point out that meeting the non-labeling language standard may require more words.

Since then, other students have remarked to me in subsequent courses, that the training they received through this model has helped they succeed in other writing assignments.

Although this article represents my first attempt at applying this model to graduate writing, student's positive responses and success suggest that further research is warranted. Hopefully, the Three Steps to Teaching Abstracts and Critiques will serve as a useful beginning for other students and faculty.

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Teaching Research Methods to Undergraduate Psychology Students Using an Active Cooperative Learning Approach

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Many undergraduate degree programs require students to develop a basic understanding of research methodology. Unfortunately, methods courses are typically unpopular with students because the course material is complex and technical in nature. Consequently, some instructors supplement traditional lecture-text classes with active learning experiences such as a student-developed research project. This paper describes a research methods course in the social sciences (psychology) based solely on multiple student-developed research projects. The paper highlights the strengths and weaknesses of this non-traditional approach to teaching research methods.

The completion of an introductory course in research methods is a critical step for undergraduate students who will one day need to conduct their own original research. These courses are equally important for students who are not planning to conduct research in the future, because graduates still need to make informed decisions regarding research findings as part of their professional development (Zablotsky, 2001). Consequently, research methods courses are a staple and essential requirement of many undergraduate programs in the social and natural sciences.

Research methods courses are challenging classes to teach because the technical complexity of the course material is quite high while student interest in this material can unfortunately be quite low. In the field of psychology, current research methods texts typically survey both qualitative (e.g., discourse analysis) and quantitative (e.g., questionnaire survey) methodologies. In addition, specialized methodologies in psychology range from single-subject procedures (e.g., single-subject discrete trial) to procedures involving thousands of participants (e.g., archival database analysis). Furthermore, the variety of techniques currently available to measure psychological variables ranges from technically sophisticated brain measures (e.g., fMRI and ERP) to subjective interpretations (e.g., Rorschach and Draw-a-Person). If this coverage of methods and terms was not daunting enough for both students and instructors, a further goal of most research methods courses is to teach students how to present research findings in both oral and written form using the scientific style and format dictated by each professional discipline. For psychology students, this requires an introduction to the stylistic and formatting nuances found in the 400-plus pages of the *Publication Manual of the American Psychological Association* (American Psychological Association, 2001).

Many excellent introductory textbooks are available that provide some coverage of the major methodologies and techniques used by social scientists. The majority of these texts follow a fairly consistent organization with each chapter covering a general research topic (e.g., ethics, theories, statistical analysis, presenting research) or a specific research methodology (e.g., survey, experimental design, quasi-experimental design). Typically, instructors use the structure provided by the text to organize classes throughout a semester or yearlong class. Most textbook publishers also provide supplementary materials, such as exams and review questions, for instructors to assess each student's knowledge of the information covered in the lectures and readings. However, any instructor who relies on a teaching approach based solely on a passive text-lecture-exam format runs the risk of driving student motivation and interest even lower. Many instructors realize this risk and include active-learning experiences in their research methods courses. Arguably the most popular active-learning experience in research methods courses is a student-developed research project (Marek, Christopher, & Walker, 2004).

Student-developed research projects involve original research conducted by a single student or a small group of students. Research projects provide a wonderful active-learning experience that students typically embrace with increased motivation and interest. Students learn first-hand the challenges of reviewing the relevant research literature when formulating research hypotheses. Reading scientific research is much more purposeful when students direct this reading towards their own specific research goals and objectives. Students design their own studies and must make many challenging methodological decisions. These methodological decisions are more meaningful to the students as the consequences of their decisions are experienced first-hand rather than simply read from a textbook. Students use statistical analysis as a tool for turning raw data into answers for research questions the students themselves have formulated. The resulting findings are much more meaningful to the student than sample problems taken from a statistics text. Students gain valuable experience

presenting research while getting immediate and specific feedback about their research efforts. Presenting research findings is much easier and more relevant when the student has been involved in each stage of the research process.

During the past five years, we have piloted a research methods course for undergraduate psychology students based solely on student-developed projects. Recent developments in teaching practices and information technologies have helped make this type of course both feasible and effective.

Recent Teaching and Information Technology Innovations

Problem-based learning (PBL) is a global teaching phenomenon that is changing the way many higher-education teaching faculty and administrators are approaching the teaching of undergraduate and graduate courses (Barrows & Tamblyn, 1980; Boud & Feletti, 1997; Duch, Groh, & Allen, 2001; Evensen & Hmelo, 2000; Savin-Baden & Major, 2004). This approach was first used on a large scale in the teaching of medical students in North America during the 1960s and 70s, and has now evolved into a general teaching ideology or framework (Savin-Baden & Major, 2004). The PBL approach to teaching builds on the active-learning pedagogy promoted by education researchers and has many commonalties with the experiential-learning developments seen in professional and career training programs. PBL has been successfully adapted to nearly the full range of subject areas offered in higher education, regardless of whether the subject matter pertains from the natural sciences, social sciences, or humanities. Originally, the PBL approach was developed for professional training courses, but the same general approach can be adapted to small theoretical classes and even large introductory classes (Duch, Groh, & Allen, 2001). New PBL courses are emerging around the world and whole institutions are working on the development of PBL based curriculums (Duch, Groh, & Allen, 2001; Savin-Baden & Major, 2004).

The main goals of a PBL course are (1) to encourage self-directed learning in the students that leads to higher motivation, better retention of material, and the development of important reasoning and problem-solving skills, and (2) to develop a better understanding in students of the group processes and skills necessary for successful working collaborations. As the goals of PBL have much in common with the goals we have for teaching research methods to undergraduate psychology students, many of the guidelines and innovations we have used in developing our course come from the PBL literature. A PBL course consists of the following general attributes: (1) students work in small groups on solving a problem, (2) the groups are encouraged to work as collaborative teams, and (3) the instructor facilitates the problem-solving process without specifically directing the process (i.e., learning is student-centered not instructor-centered).

Although we found PBL to be an exciting teaching foundation on which to base the design of our research methods course, the time and resource constraints of completing multiple student-developed research projects in a 15-week long class still existed. Fortunately, recent information technology developments have considerably eroded these constraints. High-speed Internet access now provides students with instant access to research resources and enhanced communication capabilities. On-line literature search engines allow researchers to conduct comprehensive literature reviews within seconds, and many of the target articles can now be accessed immediately via on-line journals. Even interlibrary loan requests for target articles now take only a few days to process with the use of new scanning and communication technologies. The Internet provides students with ready access to free experimental stimuli (e.g., pictures, sounds, etc.) and software tools for creating, manipulating, and presenting stimuli. The Internet can also present and deliver questionnaires, and free online survey sites exist. Students can communicate and share files with each other using Internet technology, and the same technology facilitates communication and feedback between the students and instructor. Our research methods course would not be possible without student access to these wonderful new technologies.

Class Organization

The first author teaches a research methods class to undergraduate psychology students each semester during the academic year. The class schedule consists of three 80-minute classes a week during a 15-week semester. The students are typically in their second year of undergraduate studies and take a research methods course to fulfill a requirement for graduating with a psychology major. Many education and neuroscience majors also complete this course as part of their degree requirements. The class has a maximum enrolment of 40 students and this is usually the number of students that enrolls each semester.

The instructor randomly assigns students to small groups of five students, and each group designs and conducts an original piece of research. PBL researchers suggest that groups of five to seven students are optimal for this teaching approach (Bruffet, 1999; Duch, Groh, & Allen, 2001). The majority of class time is taken up with group discussion, and the instructors act as "floating facilitators" -- moving from one group to the

next asking questions and assisting students in their understanding of the research problem requirements Sadin-Baden (2003) provides a helpful discussion on how faculty can facilitate this shift from being a lecturer to being a facilitator.

Throughout the semester, groups will work on three different research projects with group membership changing from one project to the next. This allows five weeks to design each study, collect the data, analyze the data, and present the findings. Eventually each group presents its research findings in class with a 20-minute oral presentation in a simulated conference session or with a poster in a simulated poster session. Students are then required to submit an individually written report of their group's research findings using the guidelines of the American Psychological Association. The instructor does not assign a specific textbook to the class although he does provide students with a list of recommended introductory texts in research methods that are optional texts for the course. Students are encouraged to purchase the latest edition of the American Psychological Association's publication manual to assist them with the completion of the written requirements of the class. Two graduate-student teaching assistants help facilitate group discussions and provide marking assistance.

Selection of Research Problems

The instructor assigns all groups of students the same general research problem and Table 1 lists some examples of research problems used in previous classes. Each research problem is matched to a methodology so that all groups incorporate the same methodology in the research they conduct (refer to Table 1). Without doubt, the selection of interesting and stimulating research problems for this class is one of the most challenging and important tasks for the instructor to accomplish, as is arguably the case for all PBL courses (Maufette, Kandlbinder, and Soucisse, 2004). Although changing the research problems from one semester to the next provides a creative challenge for the instructors, it also guarantees new and interesting teaching experiences each semester.

As can be clearly seen from Table 1, the authors favor research problems that relate to psychological differences between the genders. There are two reasons for this preference: (1) the study of gender differences is an area of psychology that has a long and strong empirical tradition that is growing in theoretical importance with the recent emergence of evolutionary psychology theories, and (2) gender differences are usually of particular interest and relevance to the undergraduate students who make up our classes. Table 1 also provides some examples of student projects that have resulted from these general research problems. Students embrace the opportunity to conduct research on interesting and topical questions, and the ownership of the research endeavor is strongly based with the students.

Facilitating Collaborative Student Teams

For this approach to teaching research methods to work successfully, it is vital that each group of students works efficiently as a collaborative team. As few students come to higher education with extensive experience working in collaborative learning groups, it is usually necessary to provide students with some basic information and guidance on group processes and effective team performance. We have found the Internet site maintained by the Derek Bok Center for Teaching and Learning at Harvard University to provide an excellent guide on how to build students' skills in group processes. In addition, most PBL texts cover this important topic, and we have found the discussion by Savin-Baden and Major (2004) to be very helpful.

We begin our course with class instruction on group processes that lead to cohesive team collaboration. The class focuses on group roles, leadership, communication skills, and conflict resolution. We incorporate this information into short role-playing exercises to provide students with opportunities to practice these skills in a non-threatening environment. This introduction helps to prepare students for the drastic change they may experience when moving from the more familiar and comfortable text-lecture-exam format to a group-project format. This change in teaching format is stressful for some students (Solomon & Finch, 1998) and instructors must provide outlets for students to air or resolve worries as they arise (Savin-Baden & Major, 2004). The role-playing exercises provide one such outlet, as do open communication channels between the instructors and students. Fortunately, the PBL approach to teaching facilitates communication between students and instructors by the use of small group discussions.

Peer Assessment

A fundamental goal of the class is to encourage consistent and optimal involvement of every student in each group project. One method that proponents of the PBL approach recommend to achieve this goal requires students to provide peer assessments of their fellow group members. Peer assessment purportedly rewards students who play a significant role in the group project and encourages others to assist in the project development as much as possible. We keep each group member's peer assessments confidential, and provide each student with the mean score of the assessments from their group. Empirical research

TABLE 1
Some Research Problems Provided to Students and Examples of Student Projects Generated for Each Problem. The Suggested Research Methodology to be Used by Each Student Group Is Also Provided.

Gender differences in same-sex best friendships (Case study)
Gender differences in conflict resolution by best friends
Gender differences in communication between best friends
Gender differences in the role of intimacy in best friendships
Portrayal of gender roles in the media (Observational/archival)
Stereotype portrayal of gender roles during infomercials
Gender differences in body portrayal in popular magazine covers
Gender differences in the coverage of elite athletes in the print media
Gender differences in stress and coping (Survey)
Gender differences in eating habits when stressed
Gender differences in the use of exercise when coping with stress
Wanting to have children and a career: Gender differences in role conflict
Gender differences in spatial abilities (Experimental)
Gender differences in spatial memory: Real world objects versus abstract figures
Gender differences in judging distances
Gender differences in the use of landmarks when navigating

appears to support peer assessment as a valid indicator of each individual's contribution to the group project (Ledman, 2003; Topping, 2001). However, we also supplement peer assessment with an equally weighted instructor assessment of each group's presentation.

Five Phases of Student-group Research Projects

For each of the three research projects conducted during the semester, activities generally follow the same five basic phases or steps of the research process. This allows roughly one week to be allocated to each phase, although this allocation of time may vary slightly for different research methodologies. Furthermore, the number of student group meetings held outside of class time without instructors present will vary from one phase to the next.

Phase 1: Research question generation. During the first phase, the instructor introduces the general research problem and each student group brainstorms some specific research questions for their group to investigate. The instructors facilitate this brainstorming process in classroom discussions and then the students refine their ideas by reviewing the relevant research literature out of class. Research questions resulting from these collaborative group discussions are typically of a high standard and very rarely overlap. Even if there is some overlap between groups, the commonalities and differences that arise can actually enhance later student discussions of each group's findings.

Phase 2: Research design. Once each group has chosen a research question that is approved by the instructor, the research design phase begins. Students review the relevant literature again, but now focus their reading on the methodologies used in published research. It is important during the research design phase that the instructor interacts frequently with each small group to facilitate and guide key design considerations and decisions. Sometimes it is more efficient for the instructors to provide formal instruction to the whole class in the form of a 10-15 minute mini-lecture on specific methodology aspects that all groups need to consider in their designs, such as, interview techniques or questionnaire development. At the end of the research design phase, each group submits a formal ethics proposal to the instructor for approval.

Phase 3: Data collection. The type of activities involved in the data collection phase varies considerably from one research methodology to the next. The data could come from the coding of archival sources such as magazine covers or Internet sites. But many times, human respondents or participants are required. These participants are typically recruited from friends, family members, and classmates of the students. Due to the time restrictions usually imposed on data collection, email versions of questionnaires are preferred and group data collection is encouraged. Once collected, data are coded, collated, and entered into a data file for statistical analysis. The data collection phase is often the most time consuming and demanding phase of the project and each group member needs to take an equal share of the load.

Phase 4: Data analysis. The data analysis phase generally requires much more instructor guidance than any of the other phases. Each group spends class time alone with the instructor preparing the data file for analysis, discussing the statistical analyses required, conducting the appropriate statistical tests, and interpreting the resulting findings. Due to the inexperience of the students with such analyses, in addition to the importance of the accuracy of the

findings, the instructor provides a major role in this process for each group. It is very important that the instructor is confident that all group members understand their findings, or lack of findings, before they are allowed to continue with the final phase of the research project.

Phase 5:Research presentation. The instructor provides some formal instruction to the whole class on presentation techniques and requirements, such as, APA publication style, scientific writing, PowerPoint slide layout, talk organization, and oral presentation skills. Two members from each group present their group's research in a 20-minute oral presentation to the entire class. The group presentations are organized and delivered as a simulated conference session. Each presentation is followed by a 10-minute open discussion period with the instructor acting as the chair of the conference session. Following the group presentations, each group member independently writes up their group's findings as an APA-style report that is assessed by an instructor.

Student Evaluations of the Course

Student evaluations from two group-project classes (n = 52) and two traditional lecture classes (n = 45) taught by the first author were compared. The research methods classes were matched on class size and semester taken. Table 2 presents the mean student evaluations obtained and highlights the superior evaluations reported for the group-project classes on all measures. Despite the heavy workload of the group-project class, students clearly perceived the course as an excellent learning experience. It was especially pleasing for us to see how much the group-project classes increased the students' interest in doing research.

Students from the group-project classes (n = 35) also completed a brief survey on specific aspects of this non-traditional teaching approach. The majority of respondents (82.4%) did not have prior experience with a class that involved working in small groups. Students reported that they did not miss the traditional use of exams (91.4%) or an assigned textbook (88.6%), and all students reported feeling adequately prepared to conduct research in the future. In fact, many students (75.8%) reported that they felt very well prepared. Very few students (2.9%) perceived the workload associated with the student-projects as less than other classes for the same amount of class credit, and many students (51.4%) felt that the group projects involved more work. Many students (51.4%) reported that working in small groups was a very positive experience, but some students (40.0%) reported that working in groups presented both positive aspects (e.g., useful and interesting) as well as negative aspects (e.g., frustrating and challenging). Students' attitudes towards peer assessment were overwhelming positive (86%). Of course, caution should be applied when evaluating student ratings of courses, especially when not all members of the class responded to the survey.

Strengths and Weaknesses of Learning Research Methods by Doing Research

Although student evaluations of our course is consistently positive, we accept that many research methods instructors will be concerned that the full range of methodologies and terminology found in

TABLE 2
A Comparison of Student Evaluations for PBL Research Methods Classes and Traditional Research Methods Classes

	PBL class		Traditional class		
Evaluation question	*M*	*SD*	*M*	*SD*	*t*
Quality of class discussion	4.49	0.62	4.00	0.57	4.030***
Course stimulated interest	4.48	0.81	3.48	0.74	6.310***
What was learned	4.39	0.88	3.74	0.63	4.123***
Rate course overall	4.55	0.54	4.04	0.59	4.444***

Note. Course evaluations are based on a five-point scale ranging from 1 (*very poor*) to 5 (*excellent*). Independent-samples t-tests (df = 95) compared scores from students who received student-project instruction with scores from students who received traditional lecture-text instruction.
***p<.001

contemporary research methods texts cannot be covered by this non-traditional approach to teaching research methods. Similar criticisms are often leveled at PBL courses, but research comparing traditional lecture-based courses with PBL courses has not generally found a significant difference in the content coverage of the courses (Shahabudin, 1987) or in the students' final knowledge of the topic (Antepohl & Herzig, 1999). Furthermore, research with medical students has found that students who received PBL training have fared quite well in later professional examinations and evaluations when compared with graduates from other traditionally taught medical programs (Antepol, Domeij, Forsberg & Luvigsson, 2003; Enarson & Cariaga-Lo, 2001).

Clearly, there are also some research methodologies that are not suited to student-developed projects that need to be completed in a few weeks. For example, longitudinal studies cannot be really considered for such short time periods. Availability to specific research resources may also rule out other types of methods. Developmental studies cannot be considered without access to young children as participants, and that access would be difficult to secure.

Our personal feeling is that traditionally-taught lecture courses definitely offer the possibility for a wider coverage of material, but that the group-project approach ensures a deeper understanding of the research process. We believe that learning to do research and to critically evaluate research practices are better facilitated by training critical research problem-solving and reasoning skills than by having students memorize research terms and definitions. We perceive hands-on experience in using a selection of the research tools currently available to social scientists as more important than reading about them in a book. We also believe in the critical value of teaching students to work collaboratively in groups. We believe so strongly in these points that supplementing a lecture-based course with a single student project does not fully achieve these goals. Of course, empirical research that tests the quality of research products provided by graduates from both types of methods courses would help to support these claims, and hopefully we can conduct such comparisons in the near future.

A number of pragmatic difficulties may exist for instructors trying to implement a course relying solely on student-based research projects at their institution. We are very fortunate to work at a university that provides students with wireless computer access to state-of-the-art information technology. Our course would be very difficult to teach at an institution without such research technology tools given the time frame imposed by the class duration. Some possible compromises to introducing this style of course may need to be implemented by faculty at institutions that do not provide this information technology. For example, faculty could decrease the number of projects attempted in the class or limit the scope of the final research product to a research proposal.

Some critics of the group project approach may raise concerns regarding the instructor's ability to adequately oversee and supervise eight student research projects at one time. We have certainly found this is a challenging task but quite feasible if the class remains student-centered throughout the semester. We are also fortunate to have control over class size and this helps us to keep the number of groups and group sizes to manageable numbers. This control may not be possible for some instructors who are faced with much larger class numbers. Some PBL authors recommend the use of peer tutors to overcome the demands on the instructor that a larger class can entail (Duch, Groh & Allen, 2001). In our case, these peer tutors would come from past graduates of the research methods class. However, we have not used peer tutors in our class and are concerned that these tutors would not have the necessary research experience to fulfill such a role. We hope to pilot a peer tutor system in a future research methods class to further examine this option.

Our university does not require ethical approval for undergraduate student research projects that are not going to be published. However, other institutions may have stricter IRB requirements. Such requirements could make it very difficult to conduct the student projects in the time provided. The fact that student projects are spread across the semester will help avoid the usual mid-semester glut of ethics reviews. Furthermore, we have often set projects that do not require human participation ethics approval, such as, evaluating media output or conducting naturalistic observational research (refer to Table 1 for some examples of such research projects). Faculty at other institutions could increase the number of these research projects to lessen the time burden imposed by stricter ethics requirements practiced at their institution

The use of peer assessments may also concern instructors who prefer more control of their class assessment. We believe that peer assessments do encourage better group participation and provide a good source of feedback for students, but we also recognize this method of assessment is still reasonably untested. For example, we are not sure how to use the peer assessments received from a group member who contributed little to the group

project and missed many group discussions -- should their assessments still be included? Would including self-assessments increase the validity of the resulting peer assessment scores? We are also experimenting with the relative weightings of peer and instructor assessment to optimize the fairness and validity of the final assessment. More research is definitely needed on the use of peer assessment in undergraduate courses that require group projects.

Summary

We believe that requiring undergraduate students to participate in group-based research projects throughout a semester is an excellent way to teach research methodology. This approach incorporates recent pedagogical and technological innovations and students respond well to the challenges posed by such a class format. We have also found this teaching format to be more interesting and stimulating to teach than the traditional lecture-text format. The class may not suit all instructors, especially those who favor a guaranteed coverage of a wide content or those who have restricted resources for student research. Finally, further research is required to compare the research products of students who have completed a group-project course with those who have completed a more traditional lecture-text course.

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Academic Integrity: An Instructor's Obligation

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Most research in academic dishonesty focuses on why cheating is an epidemic in educational institutions, why students commit dishonest acts, and what can be done to curtail dishonesty in the classroom. Very little research focuses on what instructors have to endure when they charge students with academic dishonesty. This paper offers insights into actual cases of academic dishonesty, the process, the appeal, the result of each infraction, and why instructors might be reluctant to report incidents. Furthermore, this paper offers guidelines that can help prepare anyone who is serious about upholding academic integrity.

Researchers have provided evidence of a recent increase in academic dishonesty. A Who's Who Among American High School Students survey (as cited by McMurtry, 2001) reported that, in 1998, 80% of the nation's best 3,123 students admitted to cheating on exams. Kleiner and Lord (1999) found that 90% of those admitting to cheating had never been caught, and 50% believed that cheating was not necessarily wrong. Schab (1991) reported that the number of students who admitted to cheating on tests increased from 34% in 1969 to 68% in 1989, while the number of students who plagiarized increased from 67% to 76% and the number of students who admitted to letting others copy their work grew from 58% to 98%. McCabe (as cited in Caroll, 2002) concurred that cheating at colleges had doubled since the early 1960s; furthermore, Koch (2000) reported that between 20% and 30% of college students cheated regularly.

Most researchers (Carnevale, 1999; Heberling, 2002; Hinman, 2000; McCabe, 2001; McCabe & Pavela, 1997; McMurtry 2001; Olt, 2002) focused their studies on how to curtail dishonesty. Some proposed discussing the importance of integrity with the students, while others proposed that students monitor themselves. Others demonstrated that honor codes can effectively reduce academic dishonesty (Bowers, 1964; Campbell, 1935; Canning, 1956; McCabe & Trevino, 1993; McCabe, Butterfield, & Trevino, 2003; McCabe, Trevino, & Butterfield, 1999; Trevino, Butterfield & McCabe, 1998).

Little research on academic dishonesty has covered the impact it has on the instructors. Every instructor plays a pivotal role in preventing dishonesty in the classroom, but many often hesitate. McCabe (2001) found that instructor sympathy for students and the tedious procedures involved in reporting dishonesty are the factors that most often cause instructors to ignore cheating.

McCabe (2001) offers a gleam of hope in that many of the students who admitted to cheating professed to have genuinely detested what they did. He discovered that most students preferred to work honestly if being honest would not put them at a disadvantage. Students further revealed that they wanted to see their instructors take the initiative to help them perform honestly. McCabe strongly advised instructors to address cheating because integrity carries little weight if instructors look the other way.

When instructors face academic dishonesty, they encounter misunderstanding of what constitutes an infraction, having to document the infraction, having to meet with various committees, and the emotional strain that comes with the allegation.

Charges of Academic Dishonesty

The incidents discussed in this paper occurred at a mid-sized public university where an academic honesty policy is clearly provided in the student handbook and the university catalog. Instructors are strongly encouraged to include the university's academic honesty policy in their syllabi. Proper procedure to charge and notify a student of an infraction is included in the university's catalog, and students are afforded judicial procedure. The incidents in this paper took place at a single institution, but the information reported is not unique to any specific institution.

The incidents happened in different classes within one department where the instructors strive to uphold academic integrity. The instructors discussed in this paper also present mandatory academic integrity workshops for new international undergraduate and graduate students.

Adam. "Adam" (all students' names have been changed) was caught sharing his answers on a computer disk with his friend. The instructor gave Adam an "incomplete" grade, which allowed him to complete the course in another term**.** The instructor did not comply with university protocol. Adam took another course to fulfill his program and performed well – until the instructor found transition problems in Adam's term project. Using Google, the instructor uncovered numerous incidents of plagiarism, and the university's librarian confirmed at least seven instances in the first

four pages. Adam then received an "F." Upon further investigation, the instructor uncovered a total of 45 instances of plagiarism in the paper and realized that Adam had tampered with the date of the paper and consistently lied.

Bart. Bart was in the top 5% of his class and had earned nearly a 4.0 grade point average (on a 4.0 scale) in his MBA program when the instructor found inconsistencies and transitional problems in Bart's term project. A librarian confirmed 11 instances of plagiarism, including incomplete and inaccurate citations. Bart received an "F."

Carrie. Carrie was a popular graduate student who had earned nearly a 4.0 grade point average (on a 4.0 scale) in her college career. Carrie was found plagiarizing over half of her book review. The instructor charged Carrie with plagiarism, gave her an "F," and excluded her from further participation in the class. The charge meant that Carrie would fail her class, delay her graduation, and potentially cause the revocation of a significant job offer.

Dana. Dana was charged with inappropriately sharing her assignment. Her instructor allowed discussion of the assignment but instructed students to complete their work independently. Dana and her friend were both given an "F" in the class and were excluded from further participation.

Academic Appeals: Instructors on the Defense

The instructors discussed in this paper are required to consult with the chairperson of their Department upon discovery of academic dishonesty. Students are then notified in writing of a formal charge. Students are given an automatic "F" in the course with the option to appeal. If the students choose to appeal, they may stay in class until the appeal is completed.

By this time, the instructor has already expended considerable time, perhaps anxiously. The instructor has had to track down the plagiarized sources, print or photocopy them in triplicate (one for the instructor, one for the student, one for the chair), cross-reference the student's paper with the plagiarized sources (which may include developing elaborate color-coding systems if the paper plagiarized a number of sources), write an explanatory letter, meet with the department chair, track down and break the news to the student, listen patiently to the student's sometimes tearful grievances, get the student to sign and date three copies of the letter (one for the instructor, one for the student, one for the department chair), and submit the documents to the chair in written and electronic forms. The meeting with the student must also include reminders of the student's right to appeal, including specific instructions on how to do so; the instructor must thereby spend time undermining his or her own argument. A paper that would have taken but a few minutes to grade can, through this process, consume hours, even if the student does not appeal.

A student has ten academic days to appeal formally to the department chair, who appoints a committee to review the charge. If the student's appeal is rejected, the student may petition to the university-level Academic Appeals Committee. The departmental committee or the Academic Appeals Committee may amend the sanctions. On the other hand, if the instructor's charge is upheld, the student is dismissed from the course.

While instructors may agree with the judicial procedure to protect the student, the procedure only heightens the emotional toll upon the instructors, who are almost always put on the defensive, while students are deemed innocent until proven guilty.

Student Academic Appeals

Adam. Adam immediately considered appealing because it was his second charge and the consequence was expulsion. Knowing that his second charge was conclusive, Adam appealed his first charge claiming that it had not been handled according to university policy. That charge was decided in Adam's favor.

Bart. Before Bart's departmental committee had even met, he had individually contacted each of its members to profess his innocence. He said he had not intended to cheat, but had done so through ignorance of citation etiquette. The committee upheld the instructor's charge, but not unanimously. One instructor argued that Bart had attempted to cite properly but had bungled it. Another instructor agreed with the first, but nonetheless voted to uphold the charge in the interest of "supporting the professor."

Bart appealed at the university level, and the instructor was contacted for any amendments to the penalty, since the departmental appeal was not unanimous. The chair offered Bart an opportunity to complete the course, provided the charge of dishonesty stayed on his file. Bart reluctantly accepted the offer and completed with a "C."

Carrie. Carrie claimed that she did not think it was necessary to use quotation marks because the material came from the book assigned and was obviously not her own work. Carrie was well prepared for her appeal, with supporting letters from her department chair, sports coach, and adviser. All of the letters indicated a certainty that the charge of plagiarism was "a misunderstanding" and that any dishonesty was completely inconsistent with Carrie's character. Carrie expressed sincere remorse and swore to better understanding. The committee heard from Carrie and the instructor separately prior to an extensive discussion of the charge.

Several university committee members discussed the unusually strong support for Carrie from well-known and respected personnel. The instructor's short period of employment was questioned as committee members noted that such an extreme punishment was excessive and more the result of an inexperienced instructor than a dishonest student. A critical discussion of Carrie's intent followed. A committee member from the Education faculty stated that since the instructor did not specifically address plagiarism in his syllabus, it would be hard to hold the student to the standard expressed in the catalog. Finally, the purpose of the institution to teach rather than to police was revisited. One member argued that a charge should be sufficient for the student to learn from the experience and that further action was unnecessary.

The committee voted to amend the sanction to a grade of zero on Carrie's assignment. The instructor accepted the committee's decision but felt betrayed. As a direct result of this case, the university policy was changed, giving the instructors greater discretion in punishing dishonesty and affirmatively requiring instructors to consult with their chairs prior to deciding on a penalty.

Dana. Dana felt that she was punished for helping a friend. She had a solid "A" and knew the assignment well. She insisted that she did nothing wrong and that her friend was never supposed to submit her work. Dana appealed her charge to the departmental appeals committee.

The departmental committee reviewed the charge and interviewed Dana and her instructor. The instructor spoke of inconsistencies between the two students' explanations. The hearing addressed several significant issues. Did Dana knowingly break the rule? Was the purpose of the committee to support its colleagues and not to undermine their authority? Was the charge well documented enough to be upheld? The discrepancies between the students' explanations were especially disconcerting. Finally, Dana's denial of responsibility troubled the committee. The departmental committee rejected Dana's appeal, and she appealed to the university level, which upheld the decision. Dana received an "F" and retook the course.

Although the appeals described were all technically upheld, the instructors were inevitably "put on trial" themselves to defend integrity in their classrooms. In most cases, instructors who choose to uphold integrity were not encouraged, but questioned for the charges they brought forth. In every case, the instructor was noticeably stressed. Often, while upholding the charges, committees or department chairs nevertheless undermined the instructors' judgments.

Upholding Integrity: Perspectives of Instructors

The primary role of an instructor is to teach, not to police dishonesty. It is nevertheless absolutely necessary to report an infraction because inaction tells students that dishonesty is acceptable. All incidents of dishonesty are complicated for instructors, starting from when they decide to file, document, and defend a charge. Instructors usually feel unsupported, isolated, and attacked during the whole of the process. Because charging students with dishonesty is serious, and the judicial process ensures that students are protected from wrongful charges, instructors must be willing to endure an onerous process.

Literature shows that when students know their instructors care about integrity and will take appropriate actions, they are less likely to be dishonest. Research has also shown that students actually preferred to be honest but needed their instructors to set the example (McCabe, 2001).

Before filing a charge, instructors need to review carefully all the suspect areas, accurately document the incidents, and carefully consider appropriate consequences. Instructors must be absolutely certain of the charge and provide as much documentation as possible, because a wrongful charge is devastating to students and instructors alike. It is easy to understand why some instructors ignore filing charges whenever they can and would prefer alternatives. Upholding integrity requires courage, perseverance, and the will to distinguish diligent students, who should receive what they have earned, from cheats.

Upholding Integrity: Perspective of Appeals Committee Members

The appeals committee plays several roles relating to academic dishonesty. While the process taxes the instructor, it is also burdensome to committee members. Hearings frequently last hours, and no matter the outcome, no one is completely satisfied. No committee members take the task lightly and the process is draining, time consuming, and inherently unrewarding.

Committee members frequently have different agendas and ideals. Some believe in strictly imposing the policy unwaveringly, without consideration for mitigating circumstances. Others want to see absolute proof, beyond any doubt, of the student's guilt. Some believe that dishonesty requires intent; if the student did not intend to cheat, then the student did not cheat. Others believe that intent is not an element and that ignorance is not a defense. After all, the most common defense is "I did not know."

Students who are better known and respected by instructors receive greater benefit of the doubt. Expressed support from instructors and staff also seems

to matter. Remorse and a promise not to repeat the offence seem to be important factors, as committee members tended to be more forgiving of students who admitted that they were wrong and were willing to learn from the experience.

Instructors who are less experienced tend to follow university protocol, while more experienced instructors are more likely to handle infractions outside the prescribed process. Some committee members are overly forgiving, believing that the process itself is a lesson and that the sanctions should not be too harsh. Others believe that even the slightest occurrence of dishonesty should result in expulsion from the institution, the academic equivalency of the death penalty. Most committee members believe the rules should be applied fairly and with consideration for the sake of learning. Applying the rules otherwise can only damage the institution (Hoover, 2002).

Guidelines for Integrity

Gostick and Telford (2003) offer ten characteristics of integrity, and six of them can help instructors instill trust in their classrooms. The characteristics include "you know that little things count," "you find the white when others see gray," "you create a culture of trust," "you keep your word," "you care about the greater good," and "you stay the course."

You know that little things count. Every incident of dishonesty should be apprehended. There should be no distinction between plagiarizing a sentence and an entire paper. Even minor cheats should be called out so that students know deviant behaviors are intolerable. When an instructor starts differentiating, integrity itself is jeopardized.

You find the white when others see gray. McCabe (2001) demonstrates that students want to be honest, but they want their instructors to take the lead. It is definitely easier to ignore acts of dishonesty, but instructors have to remain objective in their assessments. Instructors must keep their objectivity when making charges, to see the situation for what it is.

You create a culture of trust. Instructors must include clear policies in their syllabi and discuss them in class. Instructors must clearly state how students will be assessed and stick with it. Furthermore, instructors must also clearly communicate that students will keep the scores they earn. When charging students with dishonesty, instructors absolutely must not invent anything merely to make the charge itself more defensible.

You keep your word. An empty promise serves no one. Instructors who are serious about taking on the challenge to prevent the spread of academic dishonesty must be prepared to keep their word. They must be diligent and act quickly. Any instructor who wishes to sound rigorous at the beginning of a semester but who then balks at actually punishing offenders would have no ground to stand on.

You care about the greater good and you stay the course. Educators mold the next generation of leaders. Recent scandals have uncovered a deep social problem, an ethical vacuum that can be attributed to the poor training students received when they were impressionable. The misconceptions that cheating is tolerable, acceptable, even efficacious have severe adverse implications. Instructors must take the challenge to curb the epidemic of academic dishonesty, even by fighting one offense at a time.

Conclusion

Every instructor should take the utmost care when acting against academic dishonesty. No instructor takes the task lightly. Although the process can be arduous, instructors must regain the trust that was once the premise of educational institutions. The authors of this paper further implore instructors to take the challenge for the greater good, to regain trust in our institutions and to renew our students' sense of honor. Oftentimes, this work is difficult and unrewarding, but it is an instructor's obligation.

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Critical Thinking Framework For Any Discipline

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This paper identifies a 5-step framework that can be implemented in virtually any teaching or training setting to effectively move learners toward critical thinking. This interdisciplinary model, which is built upon existing theory and best practices in cognitive development, effective learning environments, and outcomes-based assessment, provides teachers with a useful framework. This framework can be used to move students toward a more active-learning environment which, ultimately, is more enjoyable and effective for teachers and students alike. An example of the model is applied in the context of accounting education, which represents a business discipline in which critical thinking has been consistently cited as both necessary and difficult to implement.

Thinking is a natural process, but left to itself, it is often biased, distorted, partial, uninformed, and potentially prejudiced; excellence in thought must be cultivated (Scriven and Paul, 2004). Critical thinking is, very simply stated, the ability to analyze and evaluate information. Critical thinkers raise vital questions and problems, formulate them clearly, gather and assess relevant information, use abstract ideas, think open-mindedly, and communicate effectively with others. Passive thinkers suffer a limited and ego-centric view of the world; they answer questions with yes or no and view their perspective as the only sensible one and their facts as the only ones relevant. Critical thinking is an important and necessary skill because it is required in the workplace, it can help you deal with mental and spiritual questions, and it can be used to evaluate people, policies, and institutions, thereby avoiding social problems (Hatcher and Spencer, 2005).

This paper identifies a 5-step framework that can be implemented in virtually any teaching or training setting to effectively move learners toward critical thinking. This interdisciplinary model, which is built upon existing theory and best practices in cognitive development, effective learning environments, and outcomes-based assessment, provides teachers with a useful framework in which to move students and lecture-based courses toward an active-learning environment.

Techniques That Encourage Critical Thinking

The lecture format of learning is a venerable and popular approach to content delivery in higher education; however, it frequently does not encourage active learning or critical thinking on the part of students. Those new to the teaching profession often adopt the lecture format because it is both teacher-centered and comes with a strong academic tradition. Unfortunately, it is very difficult to increase a student's critical thinking skills with the lecture format. Topics are discussed sequentially rather than critically, and students tend to memorize the material since the lecture method facilitates the delivery of large amounts of information. The student is placed in a passive rather than an active role since the teacher does the talking, the questioning, and, thus, most of the thinking (Maiorana, 1991).

Active learning can make the course more enjoyable for both teachers and students, and, most importantly, it can cause students to think critically. For this to happen, educators must give up the belief that students cannot learn the subject at hand unless the teacher covers it. While it is useful for students to gain some exposure to the material through pre-class readings and overview lectures, students really do not understand it until they actively do something with it and reflect on the meaning of what they are doing.

There have been many definitions of critical thinking over the years. Norris (1985) posited that critical thinking is deciding rationally what to or what not to believe. Elder and Paul (1994) suggested that critical thinking is best understood as the ability of thinkers to take charge of their own thinking. Harris and Hodges (1995) declared critical evaluation as the process of arriving at a judgment about the value or impact of a text by examining its quality.

The taxonomy offered by Benjamin Bloom some 50 years ago offers a straightforward way to classify instructional activities as they advance in difficulty (Bloom, 1956). The lower levels require less thinking skills while the higher levels require more. The theory of critical thinking began primarily with the works of Bloom (1956), who identified six levels within the cognitive domain, each of which related to a different level of cognitive ability. *Knowledge* focused on remembering and reciting information. *Comprehension* focused on relating and organizing previously learned information. *Application* focused on applying information according to a rule or principle in a specific situation. *Analysis* was defined as critical thinking focused on parts and their functionality in the whole. *Synthesis* was defined as critical thinking focused on putting parts together to form a new and original whole. *Evaluation* was defined as critical thinking focused upon valuing and making judgments based upon information. In the context of this paper, critical thinking is deemed

to take place when students are required to perform in the *Analysis*, *Synthesis*, and *Evaluation* levels of Bloom's taxonomy.

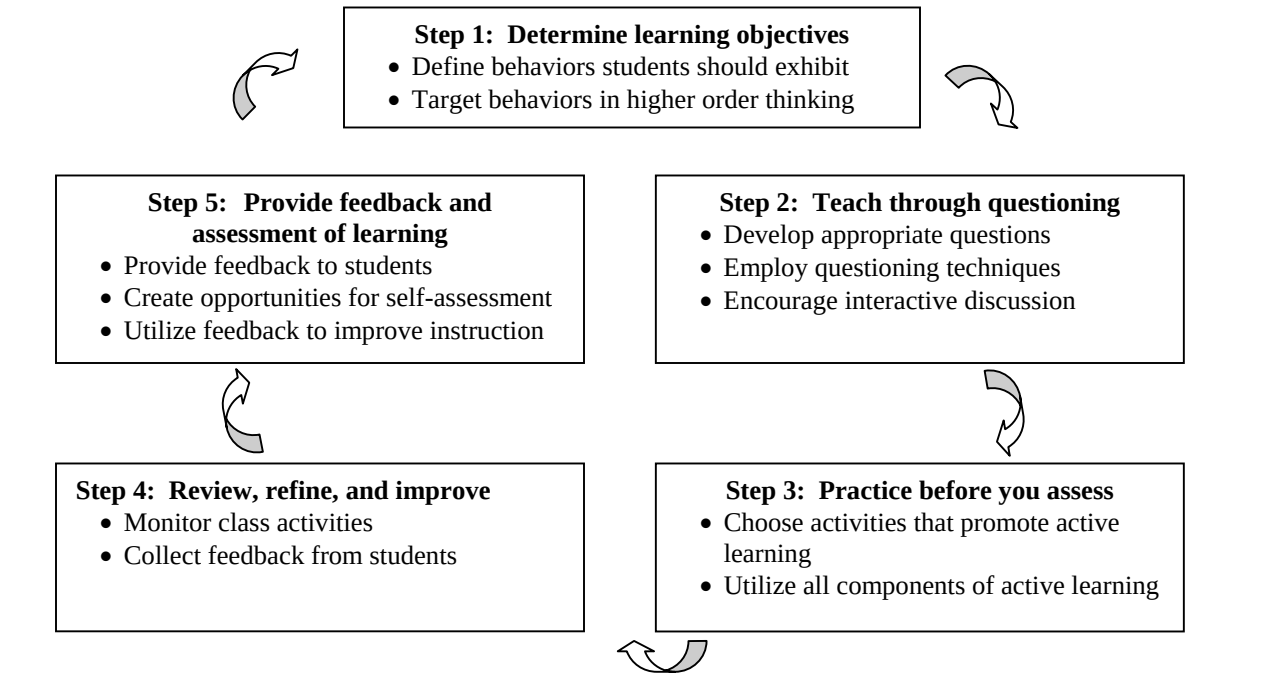
To provide the greatest benefit to students, teachers should provide many opportunities for students to engage in the upper levels of Bloom's taxonomy where critical thinking takes place. While most teachers believe that developing critical thinking in their students is of primary importance (Albrecht & Sack, 2000), few have an idea exactly what it is, how it should be taught, or how it should be assessed (Paul, Elder, & Batell, 1997). The following model (Figure 1) is a 5-step framework that can be implemented in any classroom or training setting to help students gain critical thinking skills.

5-Step Model to Move Students Toward Critical Thinking

Step 1. Determine learning objectives. Considering the importance of a course, its placement in a program of study, and its role in providing a base of knowledge to be built upon by other courses, a teacher should first identify the key learning objectives that define what behaviors students should exhibit when they exit the class. To make critical thinking happen, these learning objectives, as well as the activities and assessments, must include those tied to the higher levels of Bloom's (1956) taxonomy.

A well-written objective should include a behavior that is appropriate for the chosen level of the taxonomy. Bloom's *Knowledge* level requires an answer that demonstrates simple recall of facts. Questions at this level could ask students to answer who and what and to describe, state, and list. *Comprehension* requires an answer that demonstrates an understanding of the information. Questions at this level might ask students to summarize, explain, paraphrase, compare, and contrast. *Application* requires an answer that demonstrates an ability to use information, concepts and theories in new situations. Questions at this level may ask students to apply, construct, solve, discover, and show. *Analysis* requires an answer that demonstrates an ability to see patterns and classify information, concepts, and theories into component parts. Questions at this level could ask students to examine, classify, categorize, differentiate, and analyze. *Synthesis* requires an answer that demonstrates an ability to relate knowledge from several areas to create new or original work. Questions at this level might ask students to combine, construct, create, role-play, and suppose. Finally, *Evaluation* requires an answer that demonstrates ability to judge evidence based on

FIGURE 1
5-Step Model to Move Students toward Critical Thinking



reasoned argument. Questions at this level may ask students to assess, criticize, recommend, predict, and evaluate.

Thus, a well-written lesson plan should target a specific behavior, introduce and allow for practice of the desired behavior, and end with the learner exhibition of the behavioral response. The development of well-written questions will greatly accelerate a learner's movement into critical thinking.

Consider computer security as an example. Say that the objective is: "Students will be able to classify common security threats by category." The verb *classify* is a behavior typically identified with the *Analysis* level of Bloom's taxonomy. The three categories (natural disasters, employee errors, crime) would be presented to the students using questions to enhance the students' understanding. These questions could include (a) "What natural disasters are common in the area in which you currently live?" (b) "Are employee errors intentional acts?" and (c) "What computer crimes or acts of fraud have you read about in the past two months?" Once an understanding of the basic categories has been established, the students are placed in groups and assigned a business. Students will then be asked to identify at least three security threats from each category for that business to be shared in discussion with the entire class. Finally, students are asked individually to classify security threats by category for a business on the exam.

Step 2: Teach through questioning. Questioning is a vital part of the teaching and learning process. It allows the teacher to establish what is already known and then to extend beyond that to develop new ideas and understandings. Questions can be used to stimulate interaction between teacher and learner and to challenge the learner to defend his or her position, (i.e., to think critically). Clasen and Bonk (1990) posited that although there are many strategies that can impact student thinking, it is teacher questions that have the greatest impact. He went on to indicate that the level of student thinking is directly proportional to the level of questions asked. When teachers plan, they must consider the purpose of each question and then develop the appropriate level and type of question to accomplish the purpose. All students need experience with higher level questioning once they become familiar with a concept. Thoughtful preparation on the part of the teacher is essential in providing that experience.

Questioning techniques can be used to foster the thinking ability of students. Questions can be categorized in a number of different ways. One simple method is to use the general categories of convergent and divergent questions. Convergent questions seek one or more very specific correct answers, while divergent questions seek a wide variety of correct answers. Convergent questions apply to Bloom's lower levels of *Knowledge*, *Comprehension*, and *Application* and may include questions like "Define nutrition," "Explain the concept of investing," and "Solve for the value of X." Divergent questions apply to Bloom's higher levels of *Analysis*, *Synthesis*, and *Evaluation*; are generally open-ended; and foster student-centered discussion, thereby encouraging critical thinking. For example, "Describe the qualities that make a person successful," "Create an office design to facilitate group interaction," and "Describe how sun spots might affect tree growth" are all divergent questions.

To most effectively encourage student participation, teachers must become highly skilled questioners. This is understandably difficult and takes commitment. According to Teaching Strategies (2003), the crucial elements of a skilled questioner are that they: pose brief and concise questions, are prepared to rephrase questions, are prepared to draw further responses from participants, use a variety of techniques, redirect questions/responses, provide feedback and reinforcement without repeating answers, and spread questions around the class.

Elder and Paul (1997) proposed that the art of questioning is essential to the art of learning and that, to the extent that if they fail to ask genuine questions and seek answers to those questions, students are not likely taking the content seriously. Students learn math by asking questions about math, students learn history by asking questions about history, and students learn business by asking questions about business. Teachers can and should use questioning techniques to inspire critical thinking in the classroom.

Step 3: Practice before you assess. In the past decade, a major shift has taken place in education; that shift is toward active learning. Teachers that have used this approach generally find that the students learn more and that the courses are more enjoyable. Bonwell and Eison (1991) described active learning as involving the students in activities that cause them to think about what they are doing. Fink (2003) indicated that the concept of active learning supports research which shows that students learn more and retain knowledge longer if they acquire it in an active rather than passive manner. To make learning more active, we need to learn how to enhance the overall learning experience by adding some kind of experiential learning and opportunities for reflective dialog.

According to Fink (2003), there are two guiding principles that should be considered when choosing learning activities. First, activities should be chosen from each of the following three components of active learning: *Information and Ideas*, *Experience*, and *Reflective Dialog*. *Information and Ideas* include primary and secondary sources accessed in class, outside class, or online; *Experienc*e includes doing, observing, and simulations; *Reflective dialog* includes papers, portfolios, and journaling. Second, whenever possible, direct kinds of learning activities should be used. Examples of direct activities include doing in an

authentic setting, direct observation of a phenomenon, reflective thinking, service learning, journaling, and dialog in or outside of class.

One very important ingredient of active learning is in-depth reflective dialog. This provides students with the opportunity to reflect on the meaning of their learning experience. One can reflect with oneself, as in a journal, or with others, as in a class discussion. According to Fink (2003), in reflective writing, students should address the following questions: What am I learning? What is the value of what I am learning? How am I learning? What else do I need to learn?

When teachers think about what should happen in a course, it is important to consider the kinds of active learning that can encourage critical thinking. To enhance the overall learning experience and to create a complete set of learning activities, it is necessary to enlarge the view of active learning to include getting information and ideas, experience, reflection, and, when possible, direct experience.

Step 4: Review, refine, and improve. Teachers should strive to continually refine their courses to ensure that their instructional techniques are in fact helping students develop critical thinking skills. To accomplish this, teachers should monitor the classroom activities very closely. To track student participation, a teaching diary can be kept that identifies the students that participated, describes the main class activities, and provides an assessment of their success. Other reflective comments can also be tracked in this journal and can be very useful when revising or updating instructional activities.

Student feedback is also an important tool to be used in the improvement of a course. Angelo and Cross (1993) suggested numerous methods for collecting key information related to student learning and response to instructional techniques. One such method, the 2-minute paper, asks students to identify the most important point learned. Teachers can review the comments and use them in future classes to emphasize issues identified. Chain notes can be implemented with an envelope bearing a key question on it that students respond to by placing their answers in the envelope. Discussing the patterns of responses with the students can lead to better teaching and learning. Memory matrixes are also useful in the collection of student feedback; students are asked to fill in two-dimensional cells with labels related to a concept. For example, labels may correspond to different periods of history and students would be asked to classify events. The teacher can look for patterns among the incorrect responses and decide what might be the cause(s). These types of activities can also have positive benefits for the students. Students will become better monitors of their own learning. Students may find they need to alter study skills to improve their success in the course. Students will witness, firsthand, that the teacher cares about their learning.

Step 5: Provide feedback and assessment of learning. Teacher feedback, like assessment, compares criteria and standards to student performance in an effort to evaluate the quality of work. However, the purpose of feedback is to enhance the quality of student learning and performance, rather than to grade the performance, and, importantly, it has the potential to help students learn how to assess their own performance in the future. Feedback allows the teacher and student(s) to engage in dialogue about what distinguishes successful performance from unsuccessful performance as they discuss criteria and standards (Fink, 2003).

Teachers should provide good feedback to their students through frequent opportunities to practice whatever they are expected to do at assessment time. Teachers should spend ample time helping students to understand what the criteria and standards are and what they mean. Student peers may also provide feedback and evaluation. Each of these techniques help students learn to distinguish between satisfactory and unsatisfactory performance.

When providing feedback, teachers should be both thoughtful and purposeful. According to Wlodkowski and Ginsberg (1995), teachers should provide feedback that is informational rather than controlling, based on agreed-upon standards, specific and constructive, quantitative, prompt, frequent, positive, personal, and differential (i.e., indicating personal improvement since the last performance).

Finally, it is important to note the importance of assessment to the 5-step model itself. Information gleaned from student feedback and assessment provides an immediate and significant source of information to the teacher with respect to which objectives were met, the effectiveness of specific learning activities, things to start or stop doing, effectiveness of feedback on standards, etc. This information should be used to continually improve courses and can in turn become a valuable part of a department or discipline's outcomes-based assessment efforts.

Illustrative Example

In an effort to illustrate the application of this framework, the topic of financial statement analysis in an introductory financial accounting course will be utilized. The need for fundamental change in accounting education has been well documented for most of the past two decades (Accounting Education Change Commission, 1990; Albrecht & Sack, 2000; Doney & Lephardt, 1993). In particular, the ability to think critically, reason in a variety of ways, and solve unstructured problems has been cited consistently as a necessary quality in business graduates in general and accounting students in particular (Springer & Borthick, 2004). Accounting education has been criticized for spending too much time solving well-structured,

deterministic problems, placing excessive emphasis on memorization, being reluctant to develop creative types of learning experiences, and focusing excessively on content at the expense of skills development (Albrecht & Sack, 2000; Doney & Lephardt, 1993). The model presented in this paper seems to provide an appropriate and useful framework from which to address many, if not all, of these concerns.

Basic financial statement analysis is a skill taught in most introductory financial accounting courses. It represents a good example of a skill that is built upon in other business courses (i.e., finance, business strategy) and is also likely to be utilized by most business professionals. The first step in the model (Determine Learning Objectives) involves the determination of behaviors students should exhibit appropriate to the various levels of Bloom's taxonomy as shown in Table 1.

Note that the development of these objectives not only provides for increasingly higher levels of learning (those which demonstrate critical thinking), but also provides a basis for developing appropriate questions, designing specific learning activities, and giving feedback on and assessing student learning outcomes.

The next critical step in the model (Teach through Questioning) is to develop questions (based upon the learning objectives identified above) and prepare to employ appropriate questioning techniques that help foster an active learning environment. In this context, the use of both focused and open discussion formats is recommended. Convergent questions are utilized to assist students in mastering the basic financial analysis concepts (i.e., knowledge, comprehension, and analysis), while divergent questions are proposed for the learning outcomes identified above which may include a variety of correct responses (i.e., analysis, synthesis, and evaluation). In accounting in particular, it may be necessary occasionally for the instructor to digress to the lecture format to explain difficult concepts or computational nuances. Nonetheless, a concerted effort should be made to keep the students actively and equally engaged.

In implementing Step 3 of the model (Practice before You Assess), working through the objectives and questions can be accomplished using a variety of activities. For this particular topic, students might be given a reading assignment and then administered a short reading quiz at the beginning of class to provide both practice and feedback on the knowledge and comprehension aspects of the topic. Once the teacher is reasonably sure that the students are able to perform the analysis and compute the ratios correctly, students may be placed in teams to perform the actual analysis of the statements. For higher levels of learning, the guidelines of Fink (2003) can and should be followed. For example, students might be asked to utilize information from real companies by accessing financial statements online and then using the data to compute ratios either in groups or individually in a real world application. Students may be asked to critique the analysis, synthesis, or evaluation of others. At the conclusion of class or the learning unit, a useful exercise in this setting is that of a reflective journaling activity. For example, students might be asked to reflect in writing upon "how what I learned will be of use to me in my chosen profession." In addition to encouraging students to reflect upon what they have actually learned, this type of activity also helps make the material personally and/or professionally relevant.

Obviously, the teacher will need to continually monitor, reflect upon, and refine the activities in an effort to adapt each topic and group of students using the techniques outlined in Step 4 (Review, Refine, and Improve) of the model. A particular problem frequently encountered in accounting classes is that of the free rider effect, in which one or more strong students tend to do the bulk of the quantitative analysis to the benefit of the other members of the group. This situation can be mitigated by making expectations clear

TABLE 1
A Sample of Learning Objectives for a Financial Statement Analysis

Level	Objectives
Knowledge	Identify two basic approaches to financial statement analysis
Comprehension	Compare and contrast horizontal and vertical financial analysis.
Application	Perform a ratio analysis of a company for the most recent fiscal year.
Analysis	Compare the financial ratios of a company to industry averages and give possible reasons for any significant variances.
Synthesis	Based upon financial analysis, identify several actions a company might take to improve its operating results.
Evaluation	In the role of a potential lender, prepare a memorandum to your supervisor assessing the overall liquidity and solvency of a prospective borrower, your recommendation to extend or deny credit, and any significant assumptions made or limitations of the data you utilized in formulating your recommendation.

and holding all group members accountable for the work. For example, the teacher may require all students to prepare a solution and then randomly select one solution for grading for the entire group and/or presentation by the entire group.

Feedback and assessment of learning are provided by the teacher in the final step of the model. In this setting, feedback is relatively straight-forward with respect to the learning objectives in the lower levels of the taxonomy since accounting, by its nature, often affords the student to come up with a right or wrong answer. As was previously discussed, however, this quality of accounting education also has a tendency to produce professionals who have little tolerance for ambiguity or unstructured problem solving. It is in this area, which represents the higher levels of the taxonomy (and, thus, critical thinking) where the model can make a substantial contribution to the quality of student learning. At the same time, teachers will have to make extra efforts to provide thoughtful and purposeful feedback. Examples of outstanding work from other students or groups represent one reasonably effective way to provide feedback on the learning outcomes and standards relating to the analysis, synthesis, and evaluation of information. Standards might also include ground rules for class or group participation and responsibility for assignments.

Assessment of this topic would logically measure student performance on the objectives stated at the onset of the lesson at a level consistent with the standards articulated above. Teachers should not be afraid to ask ambiguous questions or those which require the student to identify missing or limited information, defend his or her position and recommendations, or question assumptions underlying the financial statements being analyzed. In this manner, teachers will be in the best position to assess whether or not critical thinking is indeed taking place.

This illustration has shown the applicability of the 5-step model developed in this paper to the specific context of teaching financial statement analysis in an introductory accounting course. The framework can be applied to most any discipline with appropriate modification of learning outcomes, discussion models, and activities.

Conclusion

It is important that teachers give thoughtful consideration to current instructional methods and to the personal beliefs that drive them prior to contemplating this particular approach to teaching. Implementing critical thinking through this framework clearly requires a commitment to active, student-centered learning which, at least initially, may be somewhat unfamiliar and uncomfortable to both students and teachers.

Other potential roadblocks in the application of this framework can be overcome with some planning and creativity. Although there is little question that class size and time constraints may limit the frequency and duration of techniques that encourage critical thinking, it is still very possible to engage students in large groups.

Specific disciplines may also be construed as a limiting factor when considering techniques that encourage critical thinking. Despite the widely held belief that students need to do more than just listen to learn, a survey of professors in the United States found that lecturing is the mode of instruction for 89% of physical scientists and mathematicians (Chickering & Gamson, 1987). However, active/cooperative learning as a pedagogical approach to encouraging critical thinking can be very effectively used in conjunction with lectures. According to Bonwell and Eison (1991), "when using active learning students are engaged in more activities than just listening. They are involved in dialog, debate, writing, and problem solving," as well as higher-order thinking, such as analysis, synthesis, and evaluation. The encouragement of critical thinking can be accomplished in any content area by modification of lectures and the incorporation of simple active learning techniques.

While the use of the 5-step framework to help students learn critical thinking skills may necessitate a fundamental change in instructional technique from that of the traditional lecture-based format, such efforts will likely result in learning experiences which are both more enjoyable and valuable to students and teachers alike.

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