Involving occupational therapy students in research during their fieldwork is not a new concept. Greenblatt (1964) discussed setting up positions for occupational therapy researchers in hospitals affiliated with occupational therapy education programs for the purposes of investigating science, training students during their practicums, and scouting out those therapists in training who have promise as researchers or intellectual leaders of the future. Schneider (1980) described a prereasearch seminar learning experience for occupational therapy Level II fieldwork students that took place during the mid-1960s, in which she participated as the student clinical supervisor. The objectives that shaped this seminar included the following:

- Exciting a strong interest in the process of studious inquiry or critical investigation
- Overcoming the fears and reluctance brought about by even the idea of undertaking research endeavors
- Encouraging students to conceive of themselves as thinking persons capable of doing research currently, and in the future, through the actual doing of research-type activity (Schneider, 1980)

To these objectives, I would add:

- Mutual fostering of research activity between student and therapist through a collaborative relationship that is both task and process oriented
- Communicating the excitement that research activity creates through the use of a mentoring relationship, with a more experienced researcher serving as a role model for a less experienced researcher

The objectives of the research seminar continue to be of utmost importance today, because occupational therapists hope to adopt an attitude of scientific inquiry both in furthering the development and examining the efficacy of practice (American Occupational Therapy Foundation, 1983; Ottenbacher, 1986). Peterson (1993) proposed a model for occupational therapy practice and research that uses a teaching clinic to expose Level I fieldwork students to clinical research. Colborn's (1993) study of factors that contribute to occupational therapists' ability to combine research with practice identified a number of important elements that have implications both for academic and clinical settings. Colborn concluded "not that more research courses should be taught, but changes should be made in the way research is perceived" (p. 699). To alter perceptions, Colborn suggested that real-life examples of occupational therapists involved in research are important and, therefore, local resources should be explored and collaborative efforts be made so that students might have appropriate role models. In turn, "educators' investments in students' research activity may help establish a much needed net-
work of local practitioner-researchers" (p. 700). Colborn’s suggestion for a network of local practitioner-researchers forms the backbone of the collaborative research fieldwork described in this article.

General Characteristics of the Collaborative Applied Research Experience

Each educational model of collaboration between occupational therapy education programs and community clinics that is presented in this article shares common elements. The characteristics essential to the general model are:

1. A university occupational therapy curriculum in which research application is an expected requirement of the student’s educational program.
2. An active network of clinicians and academicians committed to scientific inquiry.
3. A desire on the part of these clinicians and academicians to further their own research activity.
4. A highly structured format to help ensure that each student’s role in the research is a valuable learning experience and, if possible, a success-oriented activity, if not in outcome, at least in process.
5. An expectation of an end product—more so in the honors baccalaureate and master’s degree programs than in the traditional bachelor of science program.

In keeping with recommendations from the literature, the educational models of applied research during fieldwork that are described in this article incorporate the essential characteristics presented above. As a founding member of the School of Occupational Therapy at Dalhousie University in Nova Scotia, Canada, I helped implement Model 1, which incorporated clinical research in an honors baccalaureate program. In my position as chair of the Department of Occupational Therapy at Xavier University in Cincinnati, Ohio, I direct a curriculum in which Models 2 and 3 are currently being implemented. The department offers two types of educational programs: a bachelor of science degree in occupational therapy and a postbaccalaureate certificate in occupational therapy in partial fulfillment of a master’s degree in education.

Model 1: Collaborative Research in an Honors Baccalaureate Program

Faculty members and fieldwork supervisors affiliated with Dalhousie University have worked together to provide an integrative applied research experience to undergraduate occupational therapy students. This model could be useful both to professional occupational therapy programs and to clinical fieldwork supervisors in the United States for enhancing academic and clinical relationships by structuring collaborative research between the university educational program, the clinical fieldwork site, and the occupational therapy student. The occupational therapy curriculum at Dalhousie University was designed by Professor Barbara O'Shea, MS, OT(C), in 1980 and 1981. It included a research application course, Independent Study and Advanced Clinical Practice, which was implemented for the first time in the 1984–1985 academic year. This course required students, guided by academic faculty members and clinical fieldwork supervisors, to design and implement a research study during their final (Level II) fieldwork placements.

Ten years have elapsed since the initial implementation of this model. Both clinicians and faculty members involved with the course and the fieldwork experience believe that the model has been successful in meeting the general objectives described previously and the additional objective of fostering research in the regional fieldwork sites of Atlantic Canada. The latter objective was facilitated by providing the sites with the resource of additional personnel in the form of senior students. These students, along with the sites’ staff members, have learned more about the research process through active collaboration. An essential element of this model is that the research is of interest and relevant to current occupational therapy practice. Proposed student research topics (in the form of researchable questions) are submitted by the regional occupational therapy practitioners who usually serve in the dual roles of fieldwork supervisors and clinical research tutors during the students’ 7-week Level II fieldwork experiences.

The primary goal of the independent study course is to enable students to apply what they are learning in the more traditional research methods course (Scientific Inquiry in Occupational Therapy) by designing and carrying out a research project in their final sequence of fieldwork. The actual research component of the fieldwork is only a partial requirement of the students’ clinical practice duties in fieldwork; students devote no more than 20% of their time and assigned duties to their research projects. This fieldwork experience is most like an advanced or optional Level II fieldwork placement in the United States. Dalhousie University’s occupational therapy students are required to complete at least 1,230 hr of fieldwork (Dalhousie University, 1991/1992) versus the minimum 940 hr required in Essentials and Guidelines for an Accredited Educational Program for the Occupational Therapist (American Occupational Therapy Association [AOTA] & American Medical Association, 1991).

Students take the independent study course over both terms of the academic year for 6 credit hours. Table 1 illustrates the sequence of planning that ends with a completed student research project in the final term of the occupational therapy curriculum. This sequence includes the scientific inquiry course, which students take for 3 credit hours in the first (fall) term of their final year.
in the program. Table 1 also illustrates the sequence of the independent study course in relation to the scientific inquiry course and the students' final fieldwork rotation.

**Implementation Procedures**

As research coordinator, I worked closely with the school's fieldwork coordinator during the initial implementation of the independent study course to facilitate the development of researchable questions from clinical fieldwork supervisors at all of the sites that would be used for the students' final sequence of fieldwork experiences. The school offered a workshop to the supervisors to prepare them for developing these questions and for supervising fieldwork student-researchers in implementing their studies and collecting data. The workshop was offered in early spring, before the students' final year, after which the supervisors were asked to submit questions that students might develop as research projects. In the late spring and summer, I worked in collaboration with the fieldwork coordinator and the clinical supervisors to refine the questions into viable research projects.

The program procedures that were established during the initial implementation still exist. The research questions are presented to students in September when they return for the fall term after their summer fieldwork experiences. The independent study course instructs students in how to make their research questions operational, whereas the scientific inquiry course teaches them the components of research and of a formal research proposal. To help them develop their research proposals, each student is assigned a faculty member tutor with research interests or expertise in the student's research topic who supervises the independent study. Each of the faculty members in the school is responsible for supervising and tutoring several students. These faculty tutors often work with their students in a group seminar format in order to facilitate group learning and be more efficient.

The first year that the research projects were incorporated into the fieldwork experience, 23 students were placed in fieldwork sites. In 1993 and 1994, 36 students were placed with this model (S. Banks, personal communication, Dec. 9, 1994). Faculty tutors are assigned students on the basis of their teaching loads.

During the second part of the fall term, after receiving guidance from their faculty tutors, students' research proposals are reviewed for approval by a faculty member review committee at the school. Students then submit their proposals to the agencies in which they will be placed for their 7-week fieldwork experience in January and February. Recommendations for modifications may be made by the agencies' human subjects research or ethics review committees and, if needed, students revise their proposals accordingly before the end of the fall term. During the fieldwork rotation, students implement their studies and collect research data. After students finish the 7-week fieldwork rotation, they return to campus to complete their research project by analyzing and interpreting the data that they have collected and writing a report of the results. After submitting their research reports to their faculty tutors, students are required to present their research studies, in the form of conference presentations, to faculty members, students, and interested clinicians in the community.

**Potential Problems in Implementation**

The independent study and advanced clinical practice model presents a variation on the traditional fieldwork supervision model in which students are usually supervised by one clinician at the fieldwork site. In Model 1, during the fall term, students are guided by a faculty tutor in developing their research proposals and are in contact with the clinical research tutor (i.e., the fieldwork supervisor) who originally submitted the research question to the university. In the implementation phase of the research, students usually are supervised by occupational therapists who perform the dual responsibilities of supervising the patient care aspects of the fieldwork experience and guiding the student through the administrative and clinical aspects of the study. In most cases, the clinical research tutor and the clinical patient care supervisor are

<table>
<thead>
<tr>
<th>Table 1: Sequence of Planning for Applied Research in Fieldwork Education: Model I Honors Baccalaureate Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall Term</strong></td>
</tr>
<tr>
<td>(Proceeding May, June) - Request for relevant research questions from fieldwork sites.</td>
</tr>
<tr>
<td>September, October, November, December: Students take both Scientific Inquiry and Independent Study.</td>
</tr>
<tr>
<td>September: For independent study course, students select research question and facility for January-February fieldwork.</td>
</tr>
<tr>
<td>September, October, November: Development of research questions into formal research proposals. Proposals are reviewed by faculty members and school of occupational therapy's ethics committee and then submitted to clinical fieldwork agencies.</td>
</tr>
<tr>
<td>December: Agency ethics review committee recommends revisions, if needed, then approves research proposal.</td>
</tr>
</tbody>
</table>

| **Winter/Spring Term**                                                                                     |
| January: February: Students proceed to final 7-week fieldwork rotation, implement study, and collect data. (Data collection is intended to involve only 20% of students' work week.) |
| March: April: Students return from fieldwork, analyze and interpret data, and write up results.               |
| May: Students present their research in conference format presentation to faculty members, other students, and community therapists. Research projects and presentations are graded as part of the independent study course. |
the same person, but if two persons assume the respective roles, clear communication about expectations of student performance and evaluation is established. To promote such communication, as well as full understanding of the course by the student, a course manual was developed (Grainger & Bell, 1986) to describe expectations, schedule of assignments, and respective duties of persons involved in the course and advanced clinical practice.

In my role as the student research coordinator, at the time the course was initiated, I was the only faculty member educated at the doctoral degree level, although other faculty members did have substantial research experience. An anticipated problem was that less experienced faculty members would be (or consider themselves) ill-prepared to direct student research projects. To alleviate this problem, I met with the faculty tutors to discuss research methodology or student problems with research projects and to underscore the conviction that faculty members did not need doctoral degrees to tutor undergraduate students in their research projects.

The research coordinator position was subsequently and successfully filled by a faculty member with a master's degree. All of the school's faculty members, who are educated at the master's degree level or above, have gained both research expertise and confidence over the years.

Benefits of the Model

Many of Dalhousie University's student research projects have been presented at OT Atlantic, the annual regional occupational therapy conference involving the Atlantic provinces of Canada. Thus, a primary benefit of this model is the preparation of entry-level occupational therapists who contribute to the profession through clinical research. This contribution is demonstrated through the school's outcome data, which showed that more than 10% of the yearly student projects were presented at a professional peer-reviewed conference at the regional level, that one student project per year, on average, has been presented at the national level, and that at least four students have gone on to publish their findings in professional journals, either alone or in collaboration with faculty members (Dalhanty, 1986; Doble, Bonnell, & Magill-Evans, 1991; Lysaght, Townsend, & Orser, 1994; Unruh, Fairchild, & Versnel, 1993). The model has also succeeded in involving university faculty members in clinical research and facilitating collaborative relationships with participating clinicians. The model has generated such enthusiasm that yearly provincial research workshops are now held in response to occupational therapists' growing interest in conducting research. In 1993, for example, Dalhousie University sponsored several of these workshops, which involved more than 68 participants, at various regional sites. At one workshop, more than 50% of the rural province's occupational therapists were represented (Banks, 1993).

Potential Application to Programs in the United States

The occupational therapy baccalaureate degree program at Dalhousie University differs from many undergraduate degree programs in the United States in that it is an honors degree program. This distinction is given to those university programs that require a higher quality of work than that required by other undergraduate programs within the university. In addition to preparing graduates to become competent practitioners at the entry level, the honors program was designed to emphasize the theoretical foundations and scientific principles that form the basis for occupational therapy practice.

Two different models of collaborative research are suggested for adoption of similar applied research and clinical fieldwork experiences in the United States: Model 2, a more traditional undergraduate occupational therapy program and Model 3, a postbaccalaureate, entry-level professional program that incorporates interdisciplinary education at the graduate level.

Model 2: Collaborative Research in a Traditional Undergraduate Program

Because the United States has many well-developed, postprofessional graduate programs in occupational therapy designed to promote independent research, the expectation of an independent study research project for undergraduates is probably not realistic or applicable. Therefore, Model 1 was modified for applicability to U.S. programs. In Model 2, undergraduate students seeking a bachelor of science degree in occupational therapy register for a research application course, which is a 2-credit hour practice laboratory offered after students have taken a more traditional research methods course within the occupational therapy curriculum. Although the format of Model 2 is a very different, scaled-down version of Model 1, both models share major objectives: to encourage networking for research between persons at university and clinical sites and, at the same time, to encourage student learning and desensitization (overcoming fears and reluctance) to the applied research process in a supportive environment.

The main objective of the research application laboratory experience is to bring to life the more didactic features of the research methods course (i.e., to apply academic research knowledge in a manner that promotes interest and, possibly, excitement in the research process). Students are assigned to faculty member tutors who are involved in applied research projects or to community clinicians and will participate in this supervisor's area of research interest. Students may assist by collecting data, explaining informed consent procedures to the study par-
Participants, contributing to a review of the research literature, tabulating data for analysis, or performing other research assistant duties. Although this assignment is not a required Level I or Level II fieldwork experience, students who participate can obtain partial credit for it as an optional fieldwork experience if specified guidelines are met.

Students are scheduled for a 2- to 3-hr weekly block in the laboratory after the term in which they complete the research methods course. This time block differs from that of the advanced clinical practice fieldwork placement used in Model 1. Whereas Model 1 emphasizes the student's independent study, Model 2 emphasizes student participation. Additionally, because many occupational therapy programs in the United States currently have an insufficient number of fieldwork sites, it may be unrealistic to schedule an additional and required advanced clinical practice placement for undergraduate students. The weekly research application laboratory continues for the duration of the semester, thus allowing 13 to 14 weeks for students to follow the process of and participate in an applied occupational therapy research project. Participation in the research occurs either on campus or at a clinical facility in the community, depending on the nature of the research and whether a faculty member or clinical tutor is assigned to the student.

There are several advantages that can result from the modifications described above. Clinicians are encouraged and supported in their research interests through the collaborative relationship with the academic occupational therapy program. Faculty members are assisted in their research activities by the additional resources provided by the students—an advantage that is especially important because of the substantial amount of faculty member time and effort that is expended in guiding independent student research projects; a more limited laboratory experience decreases the faculty member workload.

Students who contribute substantially to a research project are given authorship of the published research findings, relative to the amount of contribution, and in keeping with ethical considerations for acknowledging equitable work. Attempts are made to pair students' areas of clinical or research interests with faculty members and clinicians' research and areas of expertise to promote mutual interests and role modeling within the field. Most important, because students do not have (what they sometimes perceive as the overwhelming) responsibility to conduct an independent research project, they are more likely to enjoy the practical experience of the research application laboratory and, thus, are more likely to participate in future occupational therapy research.

Although the preceding points are presented as advantages of Model 2, this does not imply that the counterpoints are disadvantages of Model 1. The two programs and collaborative research projects are very different in both scope and intent.

Model 3: Collaborative Research in a Combined Postbaccalaureate Entry-Level Occupational Therapy Professional Program and an Interdisciplinary Graduate Education Program

Model 3 has been designed as a postbaccalaureate certificate program that prepares entry-level occupational therapy students who are also pursuing the master's in education degree. This interdisciplinary program is offered through a joint effort of Xavier University's Department of Occupational Therapy and Department of Education, both of which are housed within the university's College of Social Sciences. The certificate in occupational therapy is awarded when students who have a bachelor's degree in another field successfully complete the same curriculum and fieldwork requirements as the undergraduate occupational therapy students at the university, including the basic research methods course and the application laboratory (as described in Model 2). However, because occupational therapy certificate students are also working toward the master's in education degree, they must fulfill additional research requirements specified by the Department of Education in compliance with guidelines for graduate education established by the College of Social Sciences and the Board of Graduate Studies.

Occupational therapy certificate students can complete the requirements for the master's degree in education within the 3 academic years that they are on campus pursuing their certificates. To do so, students must matriculate full time and register for an additional 18 hr of graduate courses during the 3-year period. The master's degree in education with a concentration in administration requires a minimum of 30 hr of graduate credit; however, 12 hr of upper-level undergraduate courses can be applied to the students' graduate program. The 12 hr of upper-level courses are required both as part of the postbaccalaureate and the undergraduate occupational therapy curricula and consist of the following courses: Research Methods (3 credits), Research Application Lab (2 credits), Management of Occupational Therapy Services (4 credits), and Special Topics in Occupational Therapy (3 credits), which is an elective taken for variable credit (see Table 2.)

The occupational therapy curriculum for the postbaccalaureate certificate requires that students register for the research methods course in the fall term of their final year, and the graduate program in educational administration requires that students register for a graduate educational research course that is taken in the spring term. Therefore, careful planning and coordination are necessary between the two departments to ensure that course content is not redundant and that the graduate research course actually builds on knowledge obtained in the undergraduate level occupational therapy research course. Table 2 illustrates the sequence of the courses in the occupational therapy curriculum and the graduate
education program for the third year of the program.

After the research methods course, the occupational therapy research application laboratory and the graduate level educational research paper are scheduled concurrently during the spring semester. This sequence of course work and weighting of credit hours will allow postbaccalaureate certificate students seeking the master's of education degree to initiate scientific inquiry in the fall semester. Both undergraduate and certificate students complete a prospectus of a research proposal as a partial requirement of the occupational therapy research methods course. This prospectus can then be expanded into a research project that would form the basis of the graduate educational research paper course in the spring. The Department of Education graduate research project requirement is broad based, allowing students to complete either secondary research via a literature review paper or primary research by actually carrying out a study that requires the collection of data in an applied setting.

Collaborative efforts between faculty members within the occupational therapy and education departments and clinicians or educators in the community are required if the student wishes to pursue an interdisciplinary research study involving occupational therapy in educational settings or education in occupational therapy settings. Students may choose, for instance, to pursue a topic in the public school system where occupational therapists work with children with special needs. Vocational education, independent living skill acquisition, and job training of adults or adolescents with developmental delays are other examples of topics that may be of interest to students of both disciplines. Research involving instructional technology and curriculum development would be relevant topics for those occupational therapy students aspiring to teach occupational therapy in the future. It is important that collaborative efforts are made to ensure that the topic of research inquiry is relevant to students' interest and compatible with their occupational therapy career goals.

Partial credit for Level II fieldwork may be obtained by the student if an agreed-upon contract and fieldwork schedule is made between the university and the institution sponsoring the student's applied research project. Because sites for mental health fieldwork placements are especially scarce at the current time, Xavier University is working toward the development of student fieldwork placements in educational programs for children and adolescents with severe behavioral disabilities. Given appropriate supervision by an occupational therapist, this type of placement would allow students to accumulate mental health contact hours for their Level IV fieldwork experiences and to have access to potential research subjects in an educational environment.

Another modification of collaborative research between university programs and community fieldwork sites would involve the postprofessional, or advanced, master's degree in occupational therapy. The sequence of research course gradation and research application experiences described above could easily be adopted in a graduate occupational therapy program model. I have not addressed such a model in this article because I am currently involved in Model 3's implementation. Model 3 is seen as a nontraditional alternative to a master's degree in occupational therapy, but either type of graduate program would present an excellent opportunity for promoting the collaborative research described above.

**Conclusion**

Involving occupational therapy students in applied research is feasible and recommended, regardless of whether their educational experience is at an undergraduate, postbaccalaureate, or graduate program level. Such involvement is important in promoting the socialization of occupational therapists as researchers. Previous studies have indicated that occupational therapy clinicians were interested in research and that collaboration with experienced researchers was highly desirable (Colborn, 1993; Taylor & Mitchell, 1990). Despite this interest, Colborn determined that of a national membership survey (AOTA, 1991), only 116 occupational therapists identified their work as actually combining clinical research and

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**Table 2**

**Sequence of Courses Incorporating Collaborative Research Models 2 and 3 – Traditional Undergraduate and Combined Postbaccalaureate Certificate/Master's in Education Degree Programs**

<table>
<thead>
<tr>
<th>Fall Term (August–December)</th>
<th>Credit Hours</th>
<th>Winter/Spring Term (January–May)</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Methods (Occupational Therapy)</td>
<td>3</td>
<td>Research Application Lab (Occupational Therapy)</td>
<td>2</td>
</tr>
<tr>
<td>Level I Fieldwork #3</td>
<td>1</td>
<td>Management of Occupational Services</td>
<td>4</td>
</tr>
<tr>
<td>Medical Ethics</td>
<td>3</td>
<td>Professional Issues and Ethics (Occupational Therapy)</td>
<td>2</td>
</tr>
<tr>
<td>Disabling Conditions III</td>
<td>2</td>
<td>Educational Research (for M.Ed.)</td>
<td>2</td>
</tr>
<tr>
<td>Occupational Therapy Theory &amp; Practice III</td>
<td>4</td>
<td>Educational Research Paper (for M.Ed.)</td>
<td>1</td>
</tr>
<tr>
<td>Special Topics (Occupational Therapy)</td>
<td>1</td>
<td>Special Topics (Occupational Therapy)</td>
<td>2</td>
</tr>
<tr>
<td>Education Foundation (for M.Ed.)</td>
<td>3</td>
<td>Graduate elective for M.Ed.</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

*Note: M.Ed. = Master's in Education degree*
practice. Model I has demonstrated that the number of occupational therapists interested and involved in applied research can be increased by fostering student research activity as a part of an advanced fieldwork experience (Banks, 1993). I encourage occupational therapy clinicians and academic educators who work in areas where collaborative research relationships between university and community clinics are not already established to consider adopting or modifying one of the models described in this article.

Acknowledgments

I thank Professor Barbara J. O'Shea, MS, OTR, Founding Director of the School of Occupational Therapy at Dalhousie University in Halifax, Nova Scotia, for her innovative curriculum design. I also thank those involved in the continued implementation of the Independent Study/Advanced Clinical Practice course and organization and expansion of materials that resulted in the course manual by Sheila Banks, MS, OTR, Elizabeth Bell, MS, OTR, and John Grainger, MS. I also thank all of the Dalhousie faculty tutors who have contributed to the development of the course.

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