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Kimberly K. Cleary
Idaho State University

Dana M. Howell
Idaho State University, dana.howell@eku.edu

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▲ The Educational Interaction Between Physical Therapy and Occupational Therapy Students

Kimberly K. Cleary, MPT
Dana M. Howell, OTR/L, OTD

The objectives of this study were to identify the prevalence of shared learning in U.S. physical therapy (PT) and occupational therapy (OT) education programs; determine what terminology is used for these courses; and identify perceived barriers, benefits, and challenges of the educational interactions. A survey, designed to collect information about the educational interaction between PT and OT students, was mailed to all program directors ($n = 206$) at each of the academic institutions ($N = 103$) in the United States with accredited or developing entry-level programs in PT and OT. A census study was conducted, and the entire study population received a survey. A total of 206 surveys were mailed, and 123 were returned (59.7% response rate). Of program directors, 40 (67.8%) of the PT and 42 (65.6%) of the OT program directors reported that their students shared courses with each other. None of the PT and only 8 (12.5%) of the OT directors reported that students shared clinical experiences. The term *interdisciplinary* was used most frequently to refer to shared educational experiences. Benefits of shared learning included sharing resources, collaboration, learning about the other profession, and gaining respect for the other profession. Challenges to shared learning included resource constraints, curricular differences, competition and differences between disciplines, relevance of course work, and different faculty expectations. Barriers reported by program directors whose students did not engage in interdisciplinary education were resource constraints, curricular differences, faculty attitude, and failure of past attempts. A model of interdisciplinary education that seeks to instill collaboration and understanding among professions is difficult to implement without shared clinical experiences. Most students in entry-level PT and OT programs in the United States do not currently have the opportunity to practice the teamwork that will be essential when they enter their respective professions. *J Allied Health*. 2003; 32:71-77.

MANY ALLIED HEALTH EDUCATION programs seem to embrace an interdisciplinary education model that allows resources to be shared by multiple disciplines while maintaining quality education. Some educators believe that clinicians trained in an interdisciplinary program are better prepared to collaborate with other health care professionals; delineate working boundaries; and deliver streamlined, cost-effective, well-coordinated care.¹ Although the literature base is saturated with examples of interdisciplinary education in allied health,²⁻⁸ few data exist regarding its prevalence in the United States. Important research questions regarding cost-effectiveness and efficacy of interdisciplinary education, and its impact on professional practice and health care outcomes have not been studied rigorously.^{9,10} A clear understanding of the amount and type of education interaction currently occurring in the health professions is necessary before more complex research questions can be addressed. Results of the census survey presented in this article describe the prevalence of interdisciplinary education, defined here as combined learning experiences, in physical therapy (PT) and occupational therapy (OT) programs in the United States and identify benefits, challenges, and barriers to practicing interdisciplinary education.

Many allied health education programs profess to engage in interdisciplinary education, yet the concept is not defined explicitly in the literature.¹¹ Although some authors make distinctions between terms,¹ *interdisciplinary*, *interprofessional*, *multidisciplinary*, *transdisciplinary*, *integrated*, and *shared learning* often are used synonymously.^{1,12-16} Interdisciplinary education may mean different things to educators, which makes it challenging to implement into allied health curricula.¹ Interdisciplinary education may refer to a class attended by students from more than one discipline or, more appropriately, to an educational model that seeks to instill collaboration and understanding among professions.¹⁷⁻¹⁹ Confusion among instructors regarding consistent terminology used in interdisciplinary education makes its provision difficult.

Several interdisciplinary models have been developed to guide educators and practitioners in establishing successful, collaborative relationships.¹⁷⁻¹⁹ Many allied health education programs have published descriptions and results of their efforts related to interdisciplinary programs, seminars, courses, and grant-funded projects.²⁻⁸ McMaster University used small group tutorials with PT and OT students on clinical fieldwork to facilitate shared knowledge and a team

Ms. Cleary is assistant professor of physical therapy, and Dr. Howell is assistant professor of occupational therapy, Department of Physical and Occupational Therapy, Idaho State University, Pocatello, Idaho.

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Address correspondence and reprint requests to: Kimberly K. Cleary, MPT, Department of Physical and Occupational Therapy, Idaho State University, Campus Box 8045, Pocatello, ID 83209; telephone: (208) 282-4416; e-mail: <cleakimb@isu.edu>.

approach.⁸ Interdisciplinary teams of PT, dental hygiene, and physician assistant students worked together in Kansas to address simulated and real cases in a problem-based learning format.⁷ The University of New England developed an interdisciplinary course using case studies as a framework.² The course included medical, OT, and PT students and focused on the interaction of the disciplines in clinical reasoning. PT and OT students in South Carolina participated in an Allied Health Project Grant that taught students to evaluate a geriatric population as part of an interdisciplinary team.⁵ A similar project, Gerontological Initiatives for Visionary Education, offered seminars and miniconferences to educate OT and PT students in health promotion efforts aimed at a rural, geriatric population.³ Most of these combined efforts resulted in reports from students and faculty regarding their perceptions of interdisciplinary education and the identification of some benefits and barriers to further combined experiences.

Benefits of interdisciplinary education identified in the literature include increased understanding of the roles of other disciplines on the part of faculty and students and increased respect for other disciplines. Common challenges or barriers are faculty time limitations for preparing and implementing interdisciplinary courses, differences in level of student preparedness, scheduling conflicts, poor understanding of other disciplines, and lack of commitment by faculty.^{13,16,20,21}

Minimal data are available related to the prevalence of interdisciplinary education specific to PT and OT programs. In a survey of 20 Canadian PT and OT programs, every program reported some level of interdisciplinary education, although the term was defined differently at each institution.²² Most offered combined science programs (course work that is shared by both professions, such as anatomy), as opposed to core professional classes (course work that is specific to delivering patient care, such as clinical procedures) or clinical experiences that would allow students to learn how the other discipline delivers care. Similar studies specific to PT and OT programs in the United States could determine the extent to which combined education occurs. When the prevalence of combined education is realized, further research on outcomes and efficacy of interdisciplinary education could be conducted.

The objectives of this study were to identify the prevalence of shared learning in U.S. PT and OT education programs; determine what terminology is used for these courses; and identify the type and prevalence of perceived barriers, benefits, and challenges of the educational interactions.

Methods

SUBJECTS

The study population included all academic institutions ($N = 103$) in the United States with accredited or developing entry-level programs in PT and OT. These universities, types of degrees offered by both programs, and their appro-

priate mailing addresses were identified through the American Physical Therapy Association and American Occupational Therapy Association websites.^{23,24} A survey, cover letter, and self-addressed stamped envelope were mailed to each program director of PT and OT at all of the institutions offering both entry-level programs. A total of 206 surveys were mailed ($n = 206$). A census study was conducted and the entire study population received a survey. A second copy of the survey was sent to nonrespondents 1 month after the initial mailing. By returning the completed survey, the program directors provided implied consent to participate.

SURVEY INSTRUMENT

The 11-item survey was developed by the authors and contained two sections. Section one included five questions about the educational interaction between PT and OT students at the university. In question 1, program directors were asked to report the types of courses, if any, their students take with students of the other discipline. Possible choices were *basic or core science courses*, *professional level courses*, *clinical or practicum experiences*, *other courses*, and *no shared courses*. Respondents were asked to mark all answers that applied to their students and to list course names and corresponding credit hours for each category chosen. Program directors who reported that their students shared no courses with the other discipline were asked to skip to question 5.

Question 2 asked respondents to select from a list the term or terms used to refer to the shared experiences because the terminology in the literature is unclear. Some authors use terms such as *interdisciplinary* and *multidisciplinary* interchangeably, whereas others make distinctions between the terms.^{1,12-17} Definitions of the terms were not provided so that respondents would not be swayed by definitions that may have conflicted with their own use of the term. The list included *interdisciplinary*, *multidisciplinary*, *transdisciplinary*, *no specific terms are used*, and *other (please list)*.

Qualitative data were collected in questions 3 through 5 through open-ended questions. Qualitative data are appropriate when seeking to describe a topic in depth through insights from participants.²⁵ Open-ended questions were deemed by the researchers to be the most effective way to discover the program directors' valuable perceptions about the benefits, challenges, and barriers of the combined learning experiences.

Questions 3 and 4 asked program directors who reported shared experiences in question 1 to list their perception of the benefits and challenges of the combined experiences, then to skip to section 2 of the survey. In question 5, respondents who reported no shared experiences in question 1 were asked to list their perception of the barriers to combined experiences.

Section 2 of the survey consisted of questions about program demographics. Respondents were asked to report the length of their entry-level program, the total number of seats that could be offered each year, and the year the first

TABLE 1. Reported Types and Numbers of Shared Courses

Shared Courses	PT		OT	
	n	%	n	%
Basic or core science courses	35	59.3	30	46.9
1–3 courses	26	74.3	16	53.3
4–8 courses	9	25.7	14	46.7
Professional level courses	24	40.7	25	39.1
1–3 courses	17	70.8	18	72.0
4–6 courses	7	29.2	7	28.0
Clinical experiences	0	0.0	8	12.5
Other courses	6	10.2	10	15.6
1–3 courses	6	100.0	9	90.0
4–7 courses	0	0.0	1	10.0
No shared courses	19	32.2	20	31.3

Note: n and % vary because respondents could choose more than one answer. PT, physical therapy; OT, occupational therapy.

class of students graduated. The profession of the program director and the department chair was reported. Finally, respondents were asked to identify whether their students took courses with any other health profession disciplines and, if so, to indicate those disciplines.

Quantitative survey data were processed primarily using descriptive statistics. Paired t-tests and chi-square also were calculated using SPSS. Qualitative data were obtained from the open-ended questions 3 through 5 in section 1 of the survey. Both researchers first reviewed the qualitative data for general understanding. Next, the researchers developed categories for each question that encompassed the information provided by respondents. Each line of text was matched to the appropriate category. Challenges such as “providing the right amount of material for each discipline” and “offering appropriate examples for each discipline” were grouped into the category labeled ‘relevance of combined courses to each profession.’ Finally, frequencies of text in each category were counted. Verification was achieved through triangulation of the data to the literature and by the agreement of both researchers coding the data.²⁵

Results

A total of 206 surveys were mailed, and 123 were returned (59.7% response rate). Of the surveys returned, 64 (62.1%) were from OT program directors, and 59 (57.3%) were from PT program directors. Responses did not seem to be representative of any particular area of the United States, size of program, or type of program. In general, when data from individual schools where PT and OT program directors replied were examined (36 schools/72 surveys), programs reported different numbers of shared courses. Program directors also generally reported different benefits, challenges, and barriers to combined courses, indicating a lack of agreement between PT and OT program directors at the same university.

SHARED LEARNING

Of the program directors, 40 (67.8%) of the PT and 42 (65.6%) of the OT directors reported that their students shared one or more courses with each other. Of respondents, 35 (59.3%) of the PT and 30 (46.9%) of the OT respondents reported that their students shared basic or core science courses (Table 1). The reported number of shared science courses ranged from one to eight. Examples of basic or core science courses include anatomy, physiology, and neuroscience. Of respondents, 24 (40.7%) of the PT and 25 (39.1%) of the OT respondents reported that their students shared professional-level courses. The reported number of shared professional courses ranged from one to six. Professional communication, clinical procedures, research methodology, and resource management are examples of professional-level courses reported. None of the PT and only 8 (12.5%) of the OT program directors reported students sharing clinical experiences. Clinical experiences reported include shared fieldwork, clinical practicums, and other patient care experiences. Of respondents, 6 (10.2%) of the PT and 10 (15.6%) of the OT respondents reported that their students share “other” courses. Courses reported include prerequisites, electives, grand rounds/case studies, and seminars. Of respondents, 19 (32.2%) of the PT and 20 (31.3%) of the OT respondents reported that their students do not share any courses with the other discipline.

TERMINOLOGY

Interdisciplinary was the term most frequently identified as being used to refer to shared educational experiences. Of the PT respondents who reported that their students share some courses with OT (40 [67.8%]), 13 (32.5%) reported calling the combined courses *interdisciplinary*, and 4

TABLE 2. Perceived Benefits, Challenges, and Barriers to Combined Experiences, with Frequencies, as Reported by Respondents

Categories	PT		OT	
	n	%	n	%
Benefits	38		38	
Shared resources	10	26.3	7	18.4
Collaboration among students/faculty	16	42.1	15	39.5
Personal and professional relationships	13	34.2	16	42.1
Learning about the other discipline	26	68.4	28	73.7
Gaining respect for other profession	13	34.2	9	23.7
No benefits	0	0.0	2	5.3
Challenges	35		42	
Resource constraints	11	31.4	18	42.9
Curricular differences	17	48.6	19	45.2
Competition between students	7	20.0	12	28.6
Differences between disciplines	1	2.9	12	28.6
Relevance of combined courses to each profession	6	17.1	7	16.7
Different faculty expectations	8	22.9	4	9.5
Barriers	15		18	
Resource constraints	3	20.0	7	38.9
Curricular differences	13	86.7	15	83.3
Faculty attitude	2	13.3	4	22.2
Failure of past attempts to combine	2	13.3	0	0.0

Note: n and % vary because respondents could choose more than one answer, or no answer, in each category. PT, physical therapy; OT, occupational therapy.

(10.0%) reported using the term multidisciplinary. Of the OT respondents who reported that their students shared some courses with PT (42 [65.6%]), 21 (50.0%) reported referring to the combined courses as *interdisciplinary*, and 1 (2.4%) reported using the term *multidisciplinary*. Of respondents, 22 (55.0%) of the PT respondents and 18 (42.9%) of the OT respondents indicated that no specific terms are used for combined courses. None of the respondents from PT or OT identified *transdisciplinary* as a term used by their programs to refer to combined courses. Four (10.0%) PT respondents and 3 (7.1%) OT respondents indicated an “other” term was used for shared courses, including *cross listed*, *core*, *rehab*, and *combined*.

QUALITATIVE DATA

The categories and frequencies of perceived benefits, challenges, and barriers to combined learning experiences reported by respondents are summarized in Table 2. Examples of statements in each category follow. Detailed descriptions of the qualitative data may appear in a later article.

Six benefit categories were identified based on responses from program directors whose students shared one or more courses with the other discipline. *Shared resources* included faculty workload, classroom facilities, and equipment. *Collaboration among students and faculty* included opportunities for modeling teamwork and communication, sharing ideas and goals, and simulating the workplace. *Personal and professional relationships* included enhanced professional and

social interactions among students and faculty. *Learning about the other discipline* included increasing knowledge about the other discipline’s philosophy, professional role, unique contributions to health care, and similarities to their own profession. Shared learning also was seen as an opportunity to dispel myths and stereotypes about each profession. Finally, *gaining respect for the other profession* was reported frequently and was deemed to be distinct from *learning about the other discipline*, so that it became its own category. Two (5.3%) OT respondents reported no benefits to combined experiences.

Six challenge categories were identified based on responses from program directors whose students shared one or more courses with the other discipline. *Resource constraints* included scheduling and time constraints, geographic separation between programs or facilities, equity of faculty workload, and limited time to develop a combined course. *Curricular differences* included prerequisites, course sequencing, and different degree levels offered. *Competition between students* included polarization between disciplines, perceptions of different workloads or program rigor, disparity in class sizes resulting in an “underdog” phenomenon, and turf issues. *Differences between disciplines* included lack of knowledge, myths and stereotypes about the other discipline, and difficulty retaining a positive professional identity in combined courses. *Relevance of combined courses to each profession* included providing the right amount of material, offering appropriate examples and applications for each discipline, and establishing the appropriate content

TABLE 3. Disciplines in the Health Professions that Respondents Identified as Sharing Courses with Their Entry-Level Students

Categories	PT (n = 59)		OT (n = 64)	
	n	%	n	%
Audiology	0	0.0	3	4.7
Dentistry/dental hygiene	4	6.8	2	3.1
Nursing	9	15.3	16	25.0
Pharmacy	1	1.7	2	3.1
Physician assistant	11	18.6	13	20.3
Psychology	3	5.1	10	15.6
Social work	2	3.4	8	12.5
Speech and language pathology	3	5.1	11	17.2
Other (mentioned in text)	15	25.4	24	37.5
No other disciplines	26	44.1	22	34.4

Note: n and % vary because respondents could choose more than one answer.

emphasis. Finally, *different faculty expectations* included choosing textbooks, evaluating student performance, agreeing on course content and depth, willingness to compromise, perceptions of workload, and understanding the students' background and knowledge base.

Four barrier categories were identified based on responses from program directors whose students did not share any courses with the other discipline. This group of respondents identified *resource constraints* and *curricular differences* as more than simply challenges, but as prohibitive to interdisciplinary education. In addition, respondents noted *faculty attitude*, which included resistance to compromise, not valuing interdisciplinary education, professional arrogance, and perceived competition between faculty, and *failure of past attempts to combine* as barriers.

DEMOGRAPHICS

The mean length of PT programs reported by respondents was 34 ± 10 months (range 24 to 72 months). The mean length of OT programs reported was 35 ± 15 months (range 22 to 120 months). The difference between PT and OT program length was not significant ($p = 0.79$). The mean number of students who could be admitted to PT programs was 43 ± 16 per year (range 20 to 85 students) and to OT programs was 38 ± 15 per year (range 15 to 90 students). The difference between PT and OT program size was significant ($p = 0.049$). The mean year the first class of students graduated from PT programs was 1981 ± 18 years (range 1940 to 2004), and for OT programs, it was 1986 ± 18 years (range 1918 to 2003). The difference between PT and OT respondents in the year the first class of students graduated was not significant ($p = 0.19$).

Of PT respondents, 58 (98.3%) reported that their program director is a physical therapist, whereas 1 (1.7%) PT program reported having an occupational therapist as its program director. All 64 (100%) OT respondents reported that their program director is an occupational therapist. Of PT respondents, 57 answered the question about the disci-

pline of their department chair; 32 (56.1%) reported that the program director and department chair is the same person, and 19 (33.3%) reported another physical therapist is the department chair. No PT respondents reported that an occupational therapist is the department chair, and 6 (10.5%) reported a department chair from another health profession. Of OT respondents, 62 answered the question about the discipline of their department chair; 35 (56.5%) reported that the program director and department chair is the same person, and 15 (24.2%) reported another occupational therapist is the department chair. Of OT respondents, 5 (8.1%) reported that a physical therapist is the department chair, and 7 (11.3%) reported a department chair from another health discipline.

Table 3 reports responses to whether PT and OT students take courses with students from any other health profession disciplines. Of respondents, 26 (44.1%) of PT respondents and 22 (34.4%) of OT respondents reported that their students do not take courses with students from any other health profession discipline. Of the PT and OT respondents who reported that their students do share courses with other disciplines, nursing and physician assistant programs were identified most frequently. Respondents were asked to report other disciplines (not listed in the survey) with which their students share courses. Those reported included athletic training, exercise physiology/science, health information management, nutrition/dietetics, public health, respiratory therapy, special education, and therapeutic recreation. Chi-square analysis (Fisher's exact test, two-sided) revealed that if students from PT programs take courses with OT students, they are more likely also to take courses with students from other disciplines ($p = 0.008$). The same relationship was significant for OT students who take courses with PT students ($p = 0.000$).

Discussion

Survey results indicate that approximately two thirds of PT and OT students in the United States share some type of

course work during their professional programs. Although these students gain exposure to the other discipline, most of the educational interaction between disciplines occurs in basic science and professional level courses. The nature of science courses, such as anatomy and physiology, presents a challenge to make the course work truly interdisciplinary.^{17,22} Professional-level courses, such as clinical procedures or professional communication, may offer more interdisciplinary opportunities in which students can collaborate as developing professionals.^{2,4,8,16} Our data indicate that few PT and OT students in the United States currently have the opportunity to collaborate during clinical experiences or when providing patient care. Our results show that one third of PT and OT students in the United States who attend universities that offer both programs do not have any opportunity to interact educationally.

Although several respondents reported using the term *interdisciplinary*, most do not use specific terminology to refer to the shared learning opportunities. Although some literature has made distinctions between terms,¹ responses suggest that terms used to define different levels of inter-professional education in allied health programs are unclear.^{12–16} Clarity among terms¹¹ may lead to an improved understanding of the expectations of a shared learning experience.

Benefits and challenges of shared learning based on faculty and student perceptions after interdisciplinary programs, seminars, courses, and grant-funded projects are suggested in the literature, often anecdotally.^{2,3,5} Program directors who participated in this study reported many of the same perceptions of benefits, challenges, and barriers to shared learning previously discussed in the literature. This study also documents the frequencies of these perceptions, however. Many of the issues perceived as benefits to shared learning also were seen as challenges or barriers. Sharing resources, including faculty time and classroom space, frequently was reported as a benefit of combined experiences. Conversely, limits on the same resources (resource constraints) frequently were reported as challenges or barriers. Program directors whose students share course work were willing to work through challenges to reap the accompanying benefits. Program directors whose students did not share course work described seemingly insurmountable barriers, however, that presumably outweighed any benefits to collaboration. The striking similarities between benefits, challenges and barriers suggest that it may be possible to shift challenges and barriers into benefits. This change may come through simple rescheduling of courses or through a more complex process of program redesign.

The demographic data revealed insights into some of the inherent differences between OT and PT programs in the United States that may make shared learning difficult. Discrepancies between responses by PT and OT program directors at the same university were common, even when they were reporting relatively straightforward facts, such as the number of combined courses. Programs at the same univer-

sity typically varied in length, degree level offered, and number of students enrolled. In addition to these disparities in program structure, programs reported differences in philosophy, missions, and expectations of student preparedness. These issues may be compounded further with the addition of other disciplines (Table 3) to combined classes. This diversity was presented as too challenging to overcome in some programs but as an opportunity for a richer learning experience in other programs.

Educating students in an interdisciplinary curriculum has direct implications for clinical practice. Students who have participated in interdisciplinary training may have improved overall communication with other professionals.^{1,4,8,21} Students who have the opportunity to collaborate during clinical experiences can practice the time-effective and cost-effective team approach to patient care that is crucial in the current health care environment.⁴ A model of interdisciplinary education that seeks to instill collaboration and understanding among professions^{11,17–19} is difficult to implement without shared clinical experiences. Most students in entry-level PT and OT programs in the United States currently do not have the opportunity to practice the teamwork that becomes essential when they enter their respective professions.

Future research could explore how the issues identified in this study are viewed as challenges to collaboration by some but barriers to shared learning by others. In addition, differences between students who are trained in an interdisciplinary fashion and students who are not could be measured. In educational and professional practice settings, these students' knowledge of, referrals to, and collaboration with the other profession could be compared. The relationship between how students were trained, how they practice as clinicians, and subsequent patient outcomes also should be explored. Studies that document the efficacy of interdisciplinary education could provide the impetus for more collaboration in allied health programs.

Although the prevalence of shared learning between PT and OT students in Canada has been reported in the literature,²² the type and amount of shared learning in the United States have not been reported previously, and we assume they have not been measured. That the survey was sent to the entire population of interest (census), rather than a subset (sample), is a strength of this study. The significant response rate from the study population allows authors to describe accurately the prevalence of interdisciplinary education in the United States.

In terms of survey design, the researchers created categories for responses to survey question 1 to help identify reported courses whose names may have been unfamiliar. The course categories were not defined for respondents, however. This lack of formal definitions may have resulted in respondent misunderstanding or reporting courses in one category that researchers deemed part of another category. To limit the length of the survey and encourage participation, researchers did not collect data on program cost to

students or program financial resources and expenses. This information and additional curricular or demographic information could have been collected to define further characteristics of programs whose students do or do not participate in shared learning experiences.

CONCLUSION

Interdisciplinary education in the health professions is an important topic that should be explored further. Some PT and OT students in the United States share course work, but few share clinical experiences. Although some programs perceive that barriers prevent them from collaborating, others have created some level of shared learning for their students, recognizing benefits and challenges to the educational interaction. Subsequent collaborative relationships between health care providers may result in more appropriate referrals, a greater understanding and appreciation of the roles of each professional on the health care team, and a more efficient treatment plan for the clients served.

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