# Professional Preparation of Allied Health Practitioners and Special Educators Using a Collaborative Transdisciplinary Approach

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## Abstract

*This article presents a curriculum model that emphasizes the development of transdisciplinary teaming skills for therapeutic recreation students and students from other related services professions. While health care professionals are often required to work in teams, professional preparation programs provide limited instruction and few experiences that prepare graduates for truly collaborative models of service delivery (Golightly, 1987; Orelove, 1994; Rainforth, York & Macdonald, 1992; Strawderman & Lindsey, 1995; Pew Health Professions Commission, 1991, 1993, 1995). Recent developments in health care reform are emphasizing the need for professionals in allied health to work in a more integrated and collaborative style than ever before. The need for disciplines to be more integrated in their approach to treatment is becoming the benchmark for qualified professionals. The Project TEAM (Transdisciplinary Education and Mentoring) model presented here provides students in communication disorders, early childhood/special education, occupational therapy, and therapeutic recreation with discipline-specific knowledge and skills, as well as a core of cross disciplinary courses and experiences, that prepares them to work effectively as transdisciplinary team members.*

*Keywords:* allied health, collaboration, family-centered practice, professional preparation, team approach, transdisciplinary, related services,

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Few professional training programs have an interdisciplinary or transdisciplinary theme; rather, they perpetuate unidisciplinary thinking. Assessment, program planning, and service provision are approached in isolation from a single-discipline perspective. Therefore, it is not surprising that the challenges of collaboration often exceed the desire or ability of professionals from various disciplines to work together effectively.

— Rainforth, York & MacDonald, (1992)

Collaboration and effective teaming across disciplines offers the best opportunity for a holistic approach to meeting the complex needs of infants and toddlers in early intervention programs and young children with severe disabilities. (Galentine & Seery, 1999; Garner, 1994; Harste, Woodward, & Burke, 1984; Johnson et al., 1994; Orelove & Sobsey, 1996; Rainforth, York & Macdonald, 1992). Best practices of early intervention specialists, occupational and physical therapists and speech-language pathologists find these professionals working together in schools and community-based programs. These professionals are making shared decisions, pursuing common goals and coordinating services to ensure the best care for children (American Occupational Therapy Association, 1989; American Physical Therapy Association, 1990; American Speech-Language-Hearing Association, 1991; Council for Exceptional Children, 1995). As therapeutic recreation services are provided in public schools, therapeutic recreation specialists can serve as vital members of these teams (Ashton-Shaeffer, Johnson, & Bullock, 2000; Sable, Powell & Aldrich, 1993/94).

Team structures vary from setting to setting and represent an array of approaches, including multidisciplinary, interdisciplinary, and transdisciplinary models of service delivery. Differences in these team approaches center on the extent to which the interaction of professionals is independent versus collaborative. The multidisciplinary team approach was originally developed from a medical model of care. Team members recognize the importance of contributions of other disciplines but each discipline operates independently – conducting a separate assessment, developing interventions specific to their discipline, and conducting the intervention in the setting or "room" earmarked for the discipline. There is little communication among providers.

Interdisciplinary teamwork is characterized by discipline-specific assessments with some sharing and synthesizing of information across disciplines. Implementation and evaluation activities are independent and occur within discipline settings. Goals are discipline-specific with attempts to incorporate other discipline goals where possible (Carpenter, King-Sears and Keys, 1998; Orelove & Sobsey, 1996).

Professionals who embrace the transdisciplinary model of service delivery not only work on a common problem, but share and transfer information and knowledge across disciplines. The family serves as an integral member of the team. Functions of one's primary discipline are often released to other team members. Team members provide consultation, as well as direct service, to parents and teachers. Assessment and implementation activities are not discipline-specific, but instead are usually orchestrated by the entire team and services are provided within the context of the child's natural environment (Orelove & Sobsey, 1996).

Despite the growing importance of teamwork, professional preparation programs in special education and related services disciplines (e.g., therapeutic recreation, occupational therapy, speech therapy), provide limited instruction and few experiences that prepare graduates for truly collaborative models of service delivery. Typically, pre-service training

occurs in isolation from other disciplines. Professionals enter the work force with limited knowledge of other disciplines and with few team interaction skills or experiences (Golightly, 1987; Orelove, 1994; Rainforth, York & MacDonald, 1992; Strawderman & Lindsey, 1995; York, Rainforth & Giangreco, 1990). Moreover, university faculty members fail to model collaborative behavior, instead preparing and delivering lectures from the perspective of their discipline alone (Orelove, 1994; Rainforth et. al, 1992). In an effort to address this need for more collaborative preservice training, the U.S. Department of Education, Office of Special Education Programs made multi-disciplinary professional preparation in related services and special education a priority for funding (U.S. Department of Education, 1999).

Discipline-specific education is also characteristic of allied health professional preparation programs. In fact, an over-riding majority of university programs preparing professionals in health and human services reinforce discipline-specific work at the expense of collaboration (Pew Health Professions Commission, 1991,1993,1995). In 1991, the first report of the Pew Health Professions Commission called for significant reform in the education of health care professionals. The Commission's second report in 1993 further defined the need for change in preparing future healthcare professionals. Among the emerging health care reforms described by the Commission was "increased integration of providers with a concomitant emphasis on teams to improve efficiency and effectiveness across all settings" (Pew Health Professions Commission, 1993, p 6).

A call for educational reform is again evident in the third report of the Pew Commission (1995). The Commission called for all allied health practitioners "to have a strong foundation in the sciences, increased critical thinking and problem-solving skills, and excellent communication abilities" (p.24). This report placed particular emphasis on the need to prepare health care workers to function in more integrated and managed systems of health care. The Commission further stated that "marketplace demands will require accommodating and participating in the emergence of new professions, achieved by the clustering of related existing skill sets and even disciplines" (p. 24). As Bradley, Ashbaugh & Blaney (1994), Orelove (1994), and Rainforth et al. (1992) have argued, the importance and value of collaboration and the need for disciplines to be more integrated in their approach to treatment is becoming the benchmark for qualified professionals.

The purpose of this paper is to present a model, Project TEAM (Transdisciplinary Education and Mentoring), for professional preparation of therapeutic recreation specialists, other related services professionals, and public school teachers. This model embraces a transdisciplinary approach to service delivery and provides university students with cross-disciplinary knowledge and skills and valuable experience in teaming. The model emerged from curriculum development efforts at the University of New Hampshire that focus on preparation of educators and related service personnel to work with children with Pervasive Developmental Disorders (PDD)/Autism in early childhood education. It is the contention of the authors, that even though the curriculum focuses specifically on children with PDD/Autism, the transdisciplinary nature of the curriculum

design generalizes to other populations and settings and is applicable for best practices of health care providers in clinical, school and community-based settings.

## Transdisciplinary Team Approach

Historically, the medical model of service delivery in which the focus is on "fixing" the specific illness or health problem dominates preparation of allied health professionals. Disciplines are inclined to focus on fragmented aspects of care with the assumption that improvement in isolated skills (e.g., fine motor, gross motor, language) would generalize in meaningful ways to everyday life. The limitations of this discipline-specific approach have become especially evident as related services personnel (occupational therapists, physical therapists, recreational therapists and speech and language therapists) attempt to address the complex needs of children with severe disabilities in public schools. As these allied health professionals were called upon to provide related services in school settings, the medical model of service delivery was problematic. Service delivery was episodic and fragmented and children were often judged to be unable to benefit from services (Rainforth, York & McDonald, 1992).

In the mid-1970s the United Cerebral Palsy (UCP) National Collaborative Infant Project introduced a transdisciplinary approach to service delivery. Professionals recognized that children do not perform isolated skills irrespective of function and environmental demands and that the multiple needs of children are interrelated. Transdisciplinary principles provide a more holistic perspective and require team members to work together across discipline boundaries to implement a unified plan that focuses on the quality of life of the individual. This approach requires an expanded repertoire of skills as professionals must be able to perform not only direct service, but consultation, role release, and indirect services as well.

The transdisciplinary team approach has gained increasing acceptance among teachers and related services professionals within public schools (American Occupational Therapy Association, 1989; American Physical Therapy Association, 1990; American Speech-Language-Hearing Association, 1991; Council for Exceptional Children, 1995). As transdisciplinary models of teamwork have emerged in public schools, special education teachers, early childhood intervention specialists and related service personnel are committed to a common set of goals. All team members are addressing the same outcomes, and there is a transfer of information, knowledge and skills across disciplinary boundaries. The process of transdisciplinary teaming requires professionals to be proficient in collaboration, shared decision making, cooperation, conflict resolution, and communication.

The transdisciplinary approach is truly holistic in focus and highly compatible with the person-centered tenets of therapeutic recreation. The TR profession has been guided by viewing the individual holistically and addressing quality of life concerns: one's strengths and one's dreams (Haun, 1971; Howe-Murphy, 1986; Powell & Sable,

1990). A transdisciplinary practice model provides a holistic way of envisioning a child's goals and creates greater opportunity for therapeutic recreation specialists to be involved in students attaining their dreams. Therapists focus on valued life outcomes and assist in incorporating meaningful activity into the individual's home, community, friendships, work environments and/or school. The transdisciplinary team approach challenges those who are involved with the child's progress not to segment services or hours of the day. The focus is not on separate aspects of the student's life: education, family, speech, mobility, etc.; but rather on the life and hopes/dreams of the individual. This approach uses the family, natural supports and service providers to reach these dreams. Thus collaboration with families is an inherent part of the teaming process.

*Family-Centered Practice*

The family plays a vital role in the transdisciplinary process and family empowerment is an important tenet of the family-centered care model. The Association for the Care of Children's Health (1989) recognizes and respects the pivotal role that the family plays in the lives of children with special needs. The major goal of this philosophy is to support families in the natural caregiving roles by promoting the family as a partner in the care of the child. Families and team members become partners in the planning process. The identification of learning outcomes and supports are discipline-free. Outcomes are not selected based on what is valued by professionals from various disciplines, but rather, they are selected based on family-centered priorities and valued life outcomes that are individually determined (Giangreco, Cloninger, & Iverson, 1993). The life of the student is viewed holistically and requires collaboration, a redefining of professional responsibilities, implementation of natural supports, and discipline-free goals. The following scenario experienced during Project TEAM exemplifies this view.

Adam attends an integrated preschool. His communication was limited to a Picture Exchange Communication System (PECS) used by only Adam, his teacher and aid. When Adam's mother met with the transdisciplinary team to discuss her dreams and goals for Adam, she talked of wanting her son to interact more with his classmates and identified increasing social skills as a priority. The special education teacher conducted a home visit to assess Adam's interaction skills with family members. She noted that Adam's six-year-old sister knew all of Adam's signs and interacted frequently with Adam around the house and during play. Adam's mom explained that his sister had picked up the signs over the course of time. This information was shared with the other team members. The speech therapist indicated that she could provide the necessary information and materials to the teacher so that the teacher could teach Adam's signs to the other children. The recreation therapist provided the teacher with ideas for games that incorporated the use of these signs. Adam's classmates enjoyed participating in the games, learned signs, and began communicating with Adam. Soon two students were providing Adam the assistance he needed to join others on the playground at recess. In this example the speech therapist served as a consultant, providing the classroom teacher with specific signs and the recreation therapist provided methods for teaching the signs through games. Direct services were not needed by either of the therapists.

*Professional Preparation in Higher Education*

Professional preparation programs in higher education tend to be unidisciplinary in focus and rarely provide opportunities for students from various related services or allied health disciplines to learn to work together (Pew Health Professions Commission, 1995: Stayton & Bruder, 1999). While generic competencies are alluded to in different allied health disciplines, professional preparation programs in higher education typically prepare students in their own discipline. Curricula most often focus on personnel preparation that faculty judge most critical to their specific profession. Graduates are sent out to work with other disciplines without ever having taken a course with other related service or other allied health professionals (Sable, Powell, & Aldrich, 1993/94; Stayton & Bruder, 1999). If students are taught in unidisciplinary environments, can we expect them to work effectively in a team environment? It is the belief of the authors that it is necessary to do more than simply espouse transdisciplinary theory. Skills necessary for effective teamwork should be taught within core courses that are shared across disciplines.

A review of the literature reveals a broad set of competencies required for effective teaming that cross discipline boundaries. These competencies are essential to allied health professionals irrespective of the specific position for which they are preparing. As such, these generic skills can augment the technical expertise and knowledge that is more idiosyncratic to the respective professionals, thus fostering team collaboration. Development of teaming skills is recognized as essential by occupational therapists (American Occupational Therapy Association, 1989); physical therapists (American Physical Therapy Association, 1990); speech and language therapists (American Speech-Language-Hearing Association, 1991); and special education and early childhood educators (Council for Exceptional Children, 1995). These organizations recommend that professionals be prepared to function within a transdisciplinary team.

## The TEAM Model

The authors present a model for transdisciplinary education that promotes collaborative teamwork and provides students from various disciplines with instruction and experience in transdisciplinary teaming. Through interactive and participatory instruction students develop critical thinking and problem-solving skills and model collaborative practices. The approach is family-centered and holistic in focus and is compatible with the tenets of therapeutic recreation.

The TEAM project (Transdisciplinary Education and Mentoring) at the University of New Hampshire provides preservice education to students from four disciplines, Communication Disorders, Early Childhood/Special Education, Occupational Therapy, and Therapeutic Recreation. Students from each discipline enroll in a transdisciplinary curriculum requiring sixteen credits of coursework. Faculty members from the four disciplines contribute to the syllabus design of all courses and contribute to the content

and structure of all courses. The delivery of courses uses a variety of faculty workload assignments. One course is individually instructed, while two courses involve at least two instructors. All the faculty are involved as mentors in the final capstone practicum course (see Table 1).

This new transdisciplinary program offers undergraduates and graduate students opportunities to develop collaborative problem solving skills, gain experiences working on a team, and operationalize what is meant by a 'related service'. A strong family-centered approach is reinforced through all aspects of the curriculum, didactic as well as clinical. Students are exposed to a common core curriculum that orients them to recommended practices in preschool and kindergarten education for children with PDD/autism and their families. They then have opportunities to implement these procedures with mentoring from University of New Hampshire faculty representing each of the disciplines and parent facilitators. Students take the 16-credit curriculum concurrently with their other departmental (discipline-specific) and university requirements. The curriculum offers a course sequence spanning a two-year period (four semesters).

TABLE 1

*Project TEAM Transdisciplinary Curriculum*

| Sequence/semester | Course title | Transdisciplinary, family-centered instructional strategy | Faculty discipline |
|---|---|---|---|
| Year 1/ fall | Overview of Children with PDD/Autism and Sensory Processing in Children with PDD/Autism | Family-based respite care experience; teambuilding exercises | OT & TR |
| Year 1/spring | Emergent Literacy: Learning Styles and Technology | Individualized education plan team assignment; parent lectures | Spe.Ed. |
| Year 2/fall | Overview of Augmentative & Alternative Communication and the Team Building Process | Team building activities; parent lectures; parent facilitators, team case study | CD & TR |
| Year 2/spring | Transdisciplinary Practicum | Parent interviews; school-based practicum; parents serve as team members | TR, OT, CD, Spe.Ed. |

Note. OT = Occupational Therapy; Spe. Ed. = Special Education; CD = Communication Disorders; TR = Therapeutic Recreation

Table 1 summarizes the transdisciplinary curriculum, providing the course sequence that each TEAM trainee is required to complete, course titles, instructional strategies for learning family-centered, transdisciplinary practices, and the cross-disciplinary back-

grounds of the TEAM faculty who teach the courses. Required courses include: (a) an introductory course on PDD/autism and sensory processing; (b) a course on emergent literacy, learning styles and technology; (c) a seminar on augmentative and alternative communication (AAC), and the team building process that employs a case study format constructed to stimulate teaming and problem solving; and, (d) a coordinated practicum experience in which students from the four disciplines operate as 'teams' under the direction of core faculty and on-site mentors. Interwoven within this coursework are the recurring themes of transdisciplinary approaches to service delivery and family-centered practices. Student competencies related to transdisciplinary and family-centered practices include the following:

Define the roles of teachers, related service providers, parents and other significant adults as major determinants of the quality of care and education available to young children with disabilities.

Define characteristics and benefits of a transdisciplinary team approach.

Describe the benefits of a consultative, indirect therapy approach vs. a direct therapy approach to service delivery.

Understand legal mandates and precedents that support collaborative teamwork.

Demonstrate ability to consult and assist teachers, parents, and students in the identification of assistive technology and adapted equipment essential to successful interaction in school and natural environments.

Demonstrate the ability to develop effective partnerships with parents.

Demonstrate an understanding of the relationships between program type, child characteristics, and family demographics.

Demonstrate an understanding of effective collaborative skills including engaging in role release, solving problems as a group, making decisions by consensus, and resolving conflict.

Demonstrate knowledge of guidelines for effective communication with parents and the ability to communicate openly with parents and care givers.

Demonstrate ability to effectively teach other team members how to integrate one's area of expertise into the student's daily programming.

The instructional methods and strategies utilized in these courses by TEAM faculty is an essential aspect of the delivery of the transdisciplinary content.

*Instructional Methods and Strategies*

Much of the instruction in Project TEAM courses is interactive, participatory and requires students to employ critical thinking and problem-solving skills. To facilitate transdisciplinary learning, instructional strategies are employed that model collaborative practices. Examples of instructional methods and strategies follow.

*Faculty modeling and mentoring.* Throughout the 16 credit TEAM curriculum, faculty colleagues from the various disciplines are available as mentors to all students regardless of their field of study. Core courses are either team-taught, or the TEAM faculty are committed to attending classes that are led by other instructors. Faculty create an atmosphere of suspended judgement (i.e., there isn't any one right solution to any given situation), and encourage full group participation in problem solving. They attempt to keep student discussions going without becoming involved in the actual problem solving. A holistic view of the child, the importance of a strong family-centered approach, and a commitment to self-determination and inclusive practice guide faculty comments.

*Teambuilding/cooperative learning.* The importance of communication and collaboration among team members is stressed throughout the curriculum. In the AAC/ Case Study course, the first four weeks of the course are spent developing the concept of teambuilding. Group initiatives that focus on communicating information in problem-solving groups and patterns of communication among group members are stressed (Johnson & Johnson, 2000). The effects of competition on communication and the gains of a cooperative orientation versus competitive orientation are presented through experiential activities and debriefing discussions. Students are also asked to reflect on the successes and failures of their earlier group project assignments, as they work to develop and enhance their collaborative skills.

In the remaining weeks students are asked to address complex problems in an effort to resolve real-life situations that involve a matrix of issues and systems. Problem solving requires that students develop communication skills to articulate ideas and propose solutions to other group members while simultaneously attending to and including others' ideas and perceptions in the decision-making process. Students who learn within this type of cooperative learning environment tend to feel more positively about each others disciplines and will be willing and able to interact constructively when performing a collective task (Williams, 1995). As collaboration skills are especially important to the process of teaming, the use of this methodology is particularly warranted. Teaming across disciplines with consumers and families provides students in these courses the opportunity to solve real problems faced by children with disabilities and their families.

*Problem-based learning/Case-study method of instruction.* The TEAM faculty employs a problem-based learning/case-study method of instruction for students. Early in the course sequencing, students are introduced to the case study format. Initially, TEAM faculty model teaming through the use of an instructional case study video. The TEAM

faculty view the case study and collaboratively develop an assessment plan, including the types of assessments to be implemented, the settings that would be used, and the nature of the information that is expected. Students are asked to reflect on their impressions of the group process and to ask TEAM faculty questions regarding the process. Later in this course, students are given an emergent literacy assessment case study assignment where they function as a team and develop an assessment plan based on a video case study. This assignment builds on the case study example modeled by the TEAM faculty. Students are subdivided into small transdisciplinary teams of 4-5 students representing early childhood educators, occupational therapists, therapeutic recreation specialists, and speech language pathologists. After they complete the emergent literacy case study on assessment, they progress to an intervention plan. The transdisciplinary team must create an intervention plan complete with goals and objectives based on the results of their assessment results. In their intervention plan, they must include specific suggestions for the use of assistive technologies and a description of how the plan can be implemented in a general education setting.

In the Overview of Augmentative and Alternative Communication and the Team Building Process course, students again use a case study format but this case study is field based. As a team, students develop a functional Augmentative and Alternative Communication (AAC) program for a child with PDD/Autism. The intent of the case study assignment is to a) apply knowledge of the dynamics of team collaboration; b) understand the roles and responsibilities of different members of the AAC Team; and c) develop a functional AAC program that reflects parents' priorities. In this case study, students have the opportunity to solve real problems that face children with disabilities and their families. The focus of the case study is the AAC program of the child, but it is viewed in terms of the importance of communication in the child's life and its functionality in the various areas in which communication occurs (school, home, playground, and community).

*Parent involvement.* The best way to teach students the importance of a family-centered approach is to expose students to the family early in the process. In this manner, TEAM students learn family-centered approaches to service delivery in a learning environment which embraces real-life situations. In the first course of the curriculum sequence, students are matched with a family who has a child with PDD/Autism. The parents introduce the student to the child, orient the student to the home environment, family members, neighborhood friends, and other natural supports. Once the child, parent and student are comfortable with their relationship, the student provides respite care within the home and develops an on-going relationship with the child.

The following year, in the AAC/case study course, two parent facilitators participate in the class throughout the semester and bring the family perspective to all discussions. As AAC specialists are invited to demonstrate the latest in high technology communication systems and introduce students to a range of switches and adaptations, they must also face questions of feasibility and funding sources – a parental priority. In this same course,

parents provide lectures on Lovaas and Picture Exchange Communication Symbols (PECS's) interventions and the implications of these intervention systems on the family. Lovaas is a behavioral approach to communication involving discreet trails while PECS involves the child removing a symbol (ex. object, photo, and picture) and handing it to the communication partner. Parents reflect on the impact that the communication system has had on their family, the home environment, the community and the school. Through parents' facilitation of class discussion and by sharing multiple/alternative perspectives to problems, students learn the value of family-centered practices and that interventions and education plans do not happen in a vacuum.

*Instructional technology, media and materials.* Students receive instruction through the use of a variety of learning media. The "Emergent Literacy: Learning Styles and Technology" course uses a computer lab to introduce students to dedicated software such as Boardmaker©, Intellipics©, and MP Express©. Students learn how to develop intervention strategies that incorporate this literacy software into the lives of children with PDD/autism. Ability to effectively use this software is not discipline-specific and offers each discipline a viable literacy tool. In most of the TEAM courses, the faculty uses Blackboard© to make a variety of course information available to TEAM students on line, 24 hours a day, 7 days a week. Because the TEAM curriculum relies heavily on group projects and correspondence among students, having courses available on line to students minimizes the difficulty of getting team members together in one place. Through Blackboard© students have access to on-line discussion groups, live chat rooms, team workgroups for discussion and group projects, and file transfer utilities, whenever it fits their schedules. Through the use of external links to related Internet web sites, the faculty provides opportunities for exploration beyond the classroom and required readings.

To highlight just a few examples of how active learning is enhanced through this instructional technology, students have an opportunity to engage in "real world" listservs with parents of children with PDD/Autism from around the world. They participate in the worldwide interactive Autism 2000 Conference (http://www.autismconnect.org) and listen and respond to the award winning British radio play "Charlie From Outside." Such information is then incorporated into classroom discussion and extended beyond the classroom through on-line bulletin boards and chat rooms.

*Practicum experiences and collaboration with school teams.* The capstone course in the curriculum affords students the opportunity to apply what they have learned within the school system. Prior to this practicum, most TEAM interactions were based in the home or community, with the school serving primarily as a source of information. In the practicum, students work directly with school personnel. Under the supervision of a TEAM faculty mentor, students complete the practicum in a preschool or kindergarten program. Students are assigned as a team to a specific child in a classroom. The university students work with the student, teacher, related service providers, parents, and other natural supports. Practicum sites are selected based on their commitment to inclusive, family-centered, and transdisciplinary approaches to services for children with PDD/

Autism. During the practicum, students observe and apply interventions that support the child's Individual Family Service Plan (IFSP). Students are instructed in the use of reflective journal writing as a means of self-assessment and processing daily experiences.

## Discussion

The environments in which therapeutic recreation services are delivered are in flux. Health care reform, home-based, community services and school settings all demand flexible and integrated team members who can function across disciplines. If graduates of therapeutic recreation are to be prepared to meet the challenge presented by changing models of service delivery, university curricula must be responsive and innovative in their design. There has been a call within the discipline to present new models. "What is lacking in the debate of curricular reform in therapeutic recreation is the documentation of actual models or approaches to curriculum design" (Monroe & Connolly, 1997/98, p.65). These authors emphasized the need to design a curriculum that "incorporates an emphasis on cross and interdisciplinary skill development which has been proposed in the health care reform literature" (p.65).

The Project TEAM curriculum presented here is one such model. It provides entry level TR practitioners with the foundation of their discipline specific competencies and requires students to stretch beyond their discipline to function as integrated team members. The TEAM model accomplishes this through the development of a common set of core competencies in transdisciplinary, family-center practices for all disciplines. It is likely that other core competencies can be identified that will prepare students to work in more integrated, inclusive, and collaborative environments. The Pew Commission (1991, 1993 & 1995) recommendations cited earlier support this approach.

Educational institutions have often been slow to respond to the changing work environment, despite the call from practitioners and educators (Brasile, 1992; Kinney & Witman, 1997; Kinney, Witman, Sable, & Kinney, in press; Monroe & Connolly; 1998; Pew Commission, 1995) that current approaches are inadequate. Professional preparation programs in higher education institutions have characteristically been unidisciplinary in their preparation of students. Issues of shared faculty or FTE (full-time equivalent) units and calculation of faculty workloads when there is co-teaching and/or team teaching present new challenges to curriculum development. Concerns of cost-effectiveness and generation of student credit hours are institutional pressures that require strategic planning. However, the current climate in higher education encourages increased collaboration across departments and colleges.

Although faculty workloads are sometimes a difficult administrative issue, shared coursework across programs has benefits. One potential gain is a more thorough understanding and appreciation for the contributions of each discipline by the faculty outside of one's department. Collaboration supports the department's centrality to the school and/or university mission. If faculty collaboration is truly successful, the potential for the elimination of redundancy of courses among departments is possible, as the channels

of communication across department faculty are opened. As these channels and interactions increase, research opportunities and further collaborations are nurtured.

A final issue in curriculum development that still remains uncertain is the opportune time to introduce transdisciplinary, collaborative, teaming skills to university students. Entry level preparation varies from discipline to discipline. For example, speech and language specialists and special educators are required to complete a graduate degree before entry into the field while therapeutic recreation specialists and occupational therapists enter the field after completion of an undergraduate degree.

Implementation of a transdisciplinary curriculum at the undergraduate level offers the advantage of exposing students to a cross-disciplinary paradigm before they have established strong professional boundaries. Philosophical perspectives are more fluid and much less defined. A likely result however, is that students may have less understanding of their respective discipline and the expertise it represents. Graduate students, on the other hand, may enter the transdisciplinary educational experiences with a better comprehension of their discipline, but may have more potential for having already established territorial boundaries.

The Project TEAM faculty made the decision to offer the curriculum to entry-level students within each discipline creating a learning environment that combines graduate and undergraduate students. Initially, undergraduate students experienced the difference in status as intimidating and a barrier to participation. As students formed teams (composed of a mix of undergraduate and graduate students), and implemented transdisciplinary practices, these distinctions faded. As students' ability to assess each other's strengths and attend to the process of the group improved, a more egalitarian respect for each other developed.

## Conclusion

Service delivery trends are requiring health care professionals to create and utilize models of collaborative practice. A transdisciplinary approach is especially sensitive to the demands of health care reform and allows for greater integration of disciplines. Universities must develop new models for personnel preparation with emphasis on cross-professional education. As the Pew Commission states, "There is no justification for the artificial separation of professionals in training. While legitimate areas of specialized study should remain the domain of individual professional training programs, key areas of pre-clinical and clinical training must be put together as a whole, across professional communities" (Pew Commission, 1995, p.24). Cross-professional education offers a framework for active modeling of collaborative teamwork and effective communication across disciplines. In the past decade, there has been a call both from the market place and from numerous national study reports to prepare multi-skilled allied health care professionals. The model presented here is one effort to prepare students to perform multiple functions across disciplines.

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