Institutional Issues

# Changing the Future of Health Professions: Embedding Interprofessional Education Within an Academic Health Center

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## Abstract

Institutions are increasingly considering interprofessional education (IPE) as a means to improve health care and reduce medical errors in the United States. Effective implementation of IPE within health professions education requires a strategic institutional approach to ensure longevity and sustainability. In 2007, the Medical University of South Carolina (MUSC) established Creating Collaborative Care (C$^3$), an IPE initiative that takes a multifaceted approach to weaving interprofessional collaborative experiences throughout MUSC's culture to prepare

students to participate in interprofessional, collaborative health care and research settings.

In this article, the authors describe C$^3$'s guiding conceptual foundation and student learning goals. They present its implementation framework to illustrate how C$^3$ is embedded within the institutional culture. It is housed in the provost's office, and an overarching implementation committee functions as a central coordinating group. Faculty members develop and implement C$^3$ activities across professions by

contributing to four collaborating domains—curricular, extracurricular, faculty development, and health care simulation—each of which captures an IPE component. The authors provide examples of IPE activities developed by each domain to illustrate the breadth of IPE at MUSC. The authors believe that MUSC's efforts, including the conceptual foundation and implementation framework, can be generalized to other institutions intent on developing IPE within their organizational cultures.

**M**any health care advocates have called for changes in health professions education that they argue will improve the health care system and reduce

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medical errors. Several organizations support the concept of interprofessional education (IPE) as a way to bring about needed changes.[1–3] The Association of American Medical Colleges (AAMC), for example, considers IPE and interprofessional practice to be one of the strategic areas in which the organization and its members should engage.[4] Like the AAMC, the American Association of Colleges of Pharmacy prioritizes team-based interprofessional practice, and it includes IPE within its accreditation standards.[5] Consistent with scholarly consensus, in this article we define *IPE* as a situation in which "two or more professions learn with, from and about each other to improve collaboration and the quality of health care."[6]

Although more substantive efforts in IPE have occurred in the United Kingdom and Canada than in the United States,[6–8] the literature provides evidence of a variety of IPE courses and student activities within U.S. schools,[9–13] suggesting that IPE is increasing in frequency and scope. However, a comprehensive, integrative approach to IPE is required[8,13] before IPE can have effects that extend from curricula to practice and, ultimately, to quality care—as called for by the Institute of Medicine,[1] the AAMC,[4] and others.[2,3,5] The isolated

effort of a small faculty group is not likely to lead to effective and lasting IPE; rather, IPE must be implemented strategically, with the support of institutional leadership and attention to sustainability. The University of Washington Health Sciences Center employs such a centralized approach to interprofessional collaboration, which it promotes in education, service, and research.[13]

In this article, we describe the IPE initiative at the Medical University of South Carolina (MUSC) that is designed to advance an institutional culture change. The initiative focuses on student learning, but it takes a multifaceted approach to weave interprofessional, collaborative experiences throughout the institution's academic fabric. Our experience to date confirms others' recommendations regarding development of IPE,[7,8,13] and we extend them to offer a conceptual foundation and an implementation framework as guides for developing IPE efforts at other institutions.

## Background

MUSC, a public institution of higher learning, is a freestanding academic health center composed of six colleges: dental medicine, graduate biomedical

sciences, health professions, medicine, nursing, and pharmacy. The annual enrollment is approximately 2,500 students. More than 1,300 faculty members work on the campus, which is located on a contiguous four-city-block area and includes centralized classrooms that allow students from all colleges to share space across the campus.

### Early IPE programs and initiatives at MUSC

Since the 1990s, MUSC faculty members have engaged in a variety of interdisciplinary and interprofessional initiatives; early work focused on quality improvement through interdisciplinary collaboration.[14] In 1999, a provost's task force of deans recommended enhancing IPE by creating an interdisciplinary scholars program; their recommendation led to the creation of the interprofessional Presidential Scholars Program.[15] The program has enjoyed significant success, a high profile on campus, and a competitive application process, but only a small number of students from each college benefit (at the time of this writing, approximately 40 each year).

Therefore, in 2005, college deans agreed to the development of a required cross-college activity to engage all first-year students in an interprofessional learning experience. The first Interprofessional Day was held in January 2006 for all first-year students from all colleges at MUSC, and the activity was expanded to include second-year students in 2007. Annual events include a keynote presentation for all participants followed by small-group breakout sessions in which a faculty member and a student, from different colleges, facilitate interprofessional case discussions.

### IPE as MUSC's quality enhancement plan

In late 2005, MUSC began to prepare for reaccreditation by the Southern Association of Colleges and Schools (SACS), which requires accredited institutions to submit a 10-year quality enhancement plan (QEP)—a "carefully designed and focused course of action that addresses a well-defined issue or issues directly related to improving student learning."[16] Following guidelines for developing the QEP, our faculty and student leaders considered several issues, including faculty development,

educational technology, and IPE. These discussions occurred through multiple university constituencies—including the faculty senate, student government association, deans' council, president's council, and the university committees working on the SACS reaffirmation process.

Taking into account the university's mission, resources, and history of interprofessional learning experiences for students, we reached consensus that the QEP provided us an opportunity to generate a sustainable strategic plan for IPE. To address competing QEP topic considerations and fully integrate IPE with already-established institutional education priorities, we incorporated opportunities to develop faculty expertise and technology resources (specifically, a health care simulation center). The resulting QEP, Creating Collaborative Care ($C^3$), provides the conceptual framework, operational mechanisms, and leadership commitment that make IPE central to MUSC's accreditation. What was once a well-intended occasional event has become a core component of the university's mission.

### $C^3$ Conceptual Foundation and Goals

The $C^3$ initiative is carefully designed to build the infrastructure for MUSC's interprofessional culture and learning environment, thereby enhancing our graduates' abilities to participate as effective team members in interprofessional, collaborative health care and research settings. The initiative is built on a conceptual foundation that recognizes that students at academic health centers progress through their professional education and considers the way they develop teamwork competencies. We view the process whereby student health care practitioners and biomedical scientists learn interprofessional teamwork competencies as transformational. This transformation occurs over an extended period and through increasingly expansive and sophisticated learning opportunities; students must repeatedly transfer formative knowledge, skills, and attitudes to environments in which these are all a necessity. Faculty role modeling is also an important component of this transformative learning process, particularly as students move into more

complex clinical and research learning environments.

The four student learning goals and the conceptual foundation—along with the scholarly definition of IPE[6]—have provided the design criteria for the scope and sequence of IPE at MUSC.

### Goals

The four goals of $C^3$ reflect the skills and settings that affect students' transformation as they journey from matriculation to graduation. Each goal builds on the previous one; the goals increase in complexity and affinity for the settings where students' contributions to interprofessional teamwork will be critical for effective health care delivery and translational research. The goals listed below have guided the $C^3$ implementation to date:

*Goal 1.* Students will acquire teamwork competencies.

*Goal 2.* Students will acquire knowledge, including the values and beliefs, of health professions different from their own discipline that will enable them to define interprofessional health care delivery or research.

*Goal 3.* Students will apply their teamwork competencies in a collaborative, interprofessional health care delivery or research learning setting.

*Goal 4.* Students will demonstrate their teamwork competencies in collaborative, interprofessional health care delivery or translational research contexts.

### Conceptual foundation

The $C^3$ conceptual foundation is drawn from three key sources in the literature and promotes a common understanding of the initiative's purpose among faculty, staff, and students. First, our belief that IPE is a transformational process for students is strongly influenced by and rooted in general adult learning theory, particularly the original work of Mezirow,[17] who is considered the father of transformative learning theory. In his later work, Mezirow[18] described a 10-step process for transformative learning which includes genuine experience of dilemmas that require the development of new roles and new ways of acting; clearly, developing the interprofessional team skills necessary to succeed in a complex

health care system encompasses this type of learning.

Second, we drew additional theoretical support from Kegan's[19] work on personal and professional intellectual development to build a framework for launching and developing a plausible sequence for the C[3] initiative. According to Kegan,[19] one key to success is capitalizing on the many ways in which most adult learners acquire and refine different ways of knowing over time as a result of their developmental and transformative experiences.

Third, we used work by Baxter-Magolda,[20,21] who has shown how learners move along a continuum from the most fixed to the most flexible ways of knowing. Learners' early education within any realm typically begins with *absolute knowing:* Knowledge is conceived as either right or wrong, more certain than uncertain, and within the purview of instructors, not peers. Through experience, learners progress to *transitional knowing:* Knowledge is uncertain in some areas, acquired by understanding information, dependent on the instructor to direct its application to different contexts, and explored with peers. Students next move to *independent knowing:* Knowledge is largely uncertain, held by both instructors and peers, and comes from thinking for oneself. Independent knowing requires the learner to be open-minded and to allow others to hold their own beliefs. Ultimately, professionals' learning is characterized by *contextual knowing:* Knowledge is uncertain but can be judged. Learners acquire information by synthesizing expert opinion and existing evidence, as well as their experiences and those of others.

In developing our IPE initiative, we assumed that all MUSC students need multiple and varied learning opportunities, including extracurricular and social activities, to acquire, apply, and demonstrate interprofessional teamwork competencies. Such learning opportunities must be anchored throughout their courses of study. C[3] allows students to progress through multiple, varied IPE settings, which provide them expanding but recursive opportunities to apply interprofessional teamwork competencies and to demonstrate professional maturation. Students follow a recursive learning
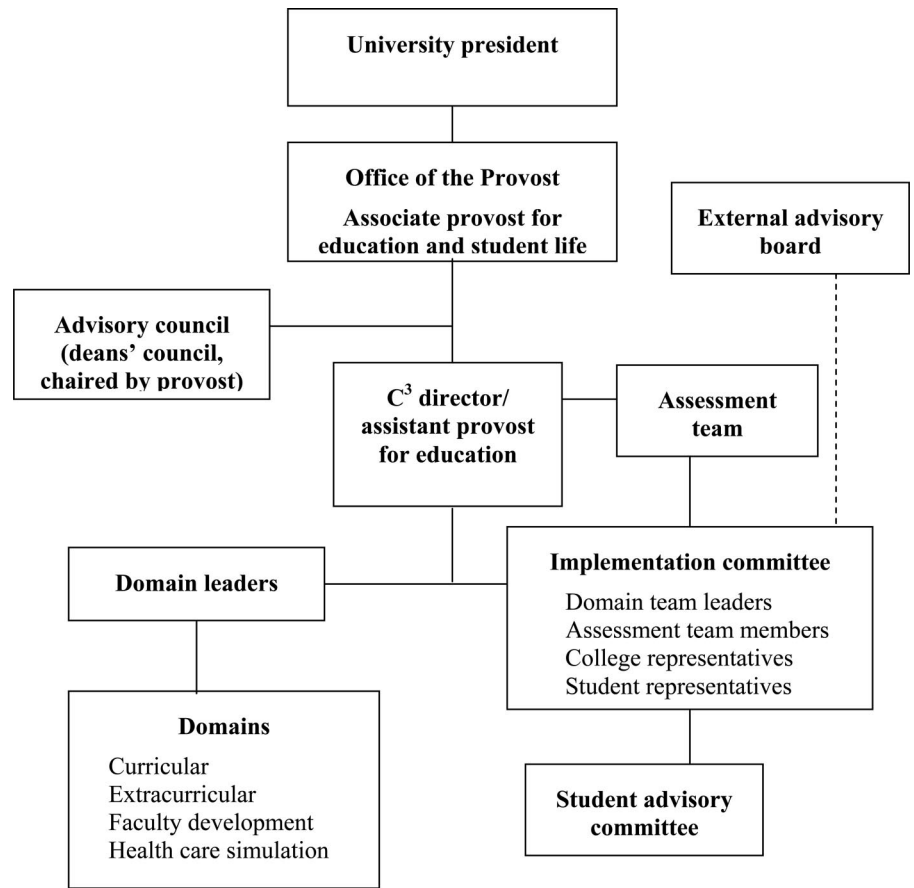


**Figure 1** Organizational structure for implementing the Creating Collaborative Care (C[3]) interprofessional education initiative at the Medical University of South Carolina.

process composed of acquisition, application, and demonstration. In the work of Anderson and Krathwol[22]—who revised Bloom's cognitive taxonomy for better use as a tool for curricular planning, instructional delivery, and assessment—*acquisition* refers to learning associated with remembering and understanding, *application* to learning associated with applying and analyzing, and *demonstration* to learning associated with evaluating and creating. When applied to IPE, this recursive learning process underpins the progression of personal and professional development necessary for building team competencies applicable to a variety of professional contexts.

### Phases of development

Students move through four key phases, based on our conceptual foundation and consonant with the C[3] goals, on their way to becoming more collaborative practitioners and scientists. As students strive to meet Goal 1, having situated themselves within the contexts of their own professions and disciplines, they

prepare to become team members and become more cognizant of how to work as part of a team. They acquire fundamental teamwork competencies that support a common understanding, and they have opportunities to envision future collaborative possibilities. In meeting Goal 2, they progress to situations in which they must begin to think like practitioners or scientists within their chosen fields as they function within a larger interprofessional context.

To meet Goal 3, students must apply competencies in novel, problem-specific situations (i.e., controlled learning settings) that challenge them to use their newly acquired knowledge to reason through solutions. Finally, students meet Goal 4 by progressing to real contexts in which they demonstrate their collaborative skills. C[3] promotes movement through this process, so learners develop maturity in their teamwork competencies and transform the ways in which they think and reason as practitioners and scientists.

## Table 1
**Creating Collaborative Care (C³) Domains and Selected Examples of Domain-Specific Interprofessional Education (IPE) Responsibilities at the Medical University of South Carolina**

| C³ domain | Examples of domain responsibilities |
|---|---|
| Curricular | Design IPE learning experiences, such as: |
| | • IPE course for first-year students |
| | • Interprofessional Service Learning Project in clinical rotations |
| | Review and approve interprofessional electives |
| Extracurricular | Support extracurricular IPE experiences, such as: |
| | • Presidential Scholars Program |
| | • CLARION Interprofessional Case Competition |
| | • IPE fellowship |
| | Design new extracurricular IPE activities |
| Faculty development | Provide team skills training sessions |
| | Host brown bag sessions |
| | Offer IPE Faculty Development Institute |
| Health care simulation | Create interprofessional learning experiences, such as: |
| | • Simulated Interprofessional Rounding Experience |
| | • Clinical skills workshops |

## C³ Implementation Framework

To ensure the initiative's success, we created an implementation framework to embed C³ within MUSC's culture (Figure 1). Consequently, the initiative is housed in the office of the provost to demonstrate institutional commitment. The C³ director reports to the associate provost for education and student life and liaises with the deans' council (chaired by the provost and composed of deans and other institutional leaders), which serves in an advisory capacity. An overarching implementation committee, with faculty representatives from each college, functions as a central coordinating group and supports the work of the four interrelated domains (detailed below). An assessment team, composed of institutional experts in quantitative and qualitative assessment, works to evaluate multiple aspects of students' interprofessional learning and the impact of the initiative on the institutional culture. Although students serve on the implementation committee and the domain committees, we established a C³ student advisory committee to ensure students had broader input into the initiative. We also enlisted three international IPE experts to serve as an external advisory board.

## C³ domains

We developed four discrete but collaborating domains to initiate C³. Each domain, directed by a domain leader and faculty/student committee, captures an IPE component and builds on MUSC's existing or developing resources, programs, and activities. The domains work synergistically to achieve the goals and overall purpose of C³. Table 1 presents examples of activities developed and implemented in each domain.

**The curricular domain.** The curricular domain addresses IPE within academic programs to ensure that all students have learning and assessment experiences that focus on IPE. Because the first goal of C³ is for students to acquire basic teamwork competencies, the faculty developed MUSC team competencies to guide students' skill development within their academic programs. The programs are implementing a variety of classroom experiences to address such development, including presentations and interactive exercises.

To address the second and third C³ goals systematically, in spring 2010 we added a required IPE course for first-year students in every degree program to introduce students to core educational objectives shared across health care professions: patient safety and error reduction; the intersection of ethics, culture, and biomedicine; health care disparities; and social determinants of health. We developed course content to address common curricular needs, and programs have adjusted their credit hours requirements and course contents to accommodate the course. To address

scheduling conflicts, we deliver the course online, but we require students to complete a group project in which they apply their interprofessional teamwork skills.

We are introducing other interprofessional experiences within particular learning contexts to further students' development of collaborative abilities. One example is the Interprofessional Service Learning Project[23]: during required clinical rotations, medical, pharmacy, physician assistant, and master of health administration students work together on community-based projects. We also offer interprofessional electives (e.g., humanities, medical Spanish, oral health, and quality improvement) for students interested in learning more about a particular subject area through an interprofessional lens.

**The extracurricular domain.** The extracurricular domain complements and enhances the academic environment by purposefully infusing interprofessional collaboration throughout student organizations and extracurricular activities. IPE is not limited to the classroom, clinic, or lab; it must be embedded in all aspects of student life, including social events. Therefore, we have introduced team skills training in student organizations. The student-organized Student Interprofessional Society sponsors planned social events and service activities. Several long-standing IPE experiences have continued, such as the Presidential Scholars Program mentioned earlier and the local CLARION Interprofessional Case Competition, which is modeled after the original program at the University of Minnesota.[24] (Our local winning team has gone forward to national competition for the past four years.) The student-run, interprofessional Community Aid, Relief, Education and Support Clinic continues to provide free services for uninsured local residents.

Building on these and other extracurricular opportunities, students may choose to complete an IPE fellowship during their education to demonstrate to employers or residency directors that they have acquired the knowledge and skills needed to be effective leaders in interprofessional collaboration. This fellowship, which is noted on students' transcripts, encourages students to seek additional opportunities to build teamwork skills

## Table 2

**The Four Interprofessional Education Student Learning Goals of the Creating Collaborative Care (C³) Initiative and Their Associated Outcome Measures at the Medical University of South Carolina**

| C³ goal | Student learning outcome measures |
|---|---|
| 1. Students will acquire teamwork competencies. | • Describe effective teamwork competencies<br>• Demonstrate effective teamwork competencies |
| 2. Students will acquire knowledge, including the values and beliefs, of health professions different from their own discipline that will enable them to define interprofessional health care delivery or research. | • Define interprofessional health care delivery or research and its value<br>• Discuss the value added by interprofessional collaboration to their own profession<br>• Display appreciation of interprofessional collaboration |
| 3. Students will apply their teamwork competencies in a collaborative interprofessional health care delivery or research learning setting. | • Apply teamwork competencies with other health care professions in learning settings |
| 4. Students will demonstrate their teamwork competencies in collaborative interprofessional health care delivery or translational research contexts. | • Demonstrate teamwork competencies in collaborative interprofessional health care delivery or translational research contexts<br>• Discuss the added value of effective teamwork to health care or translational research<br>• Display appreciation for other health professions' contributions to health care or translational research |

and apply them through a variety of IPE options.

**The faculty development domain.** The faculty development domain focuses on continuing education about IPE. Faculty members must have knowledge, skills, and values of interprofessional collaboration to teach IPE effectively in curricular offerings, to support students in extracurricular activities, and to serve as role models and mentors within educational, clinical, and laboratory environments. When faculty embrace interprofessional collaboration in their educational work with students and in their other academic functions (e.g., research, clinical work, institutional service), they further embed IPE within the institutional culture.

To address faculty development, we offer basic team skills training sessions for faculty members engaged in IPE. A handbook based on the MUSC team competencies guides faculty members' work with students around team skills development. Noon "brown bag" sessions related to IPE are held; topics include students' perspectives on IPE and institutional examples of effective interprofessional teamwork.

Approximately 25 to 45 faculty members attend these sessions. In February 2009, we established an IPE faculty institute to provide interested faculty and staff with advanced team-building skills and IPE knowledge. Nineteen faculty members—clinicians and basic scientists—participated in the 2009 institute, and 20 are participating in the 2010 offering. As a sign of the cultural change possible with committed leadership, faculty interprofessional collaboration is now included in criteria for faculty promotion and existing university faculty awards. As faculty members work to acquire IPE skills and learn to value interprofessional collaboration, IPE is further woven into the institution's culture.

**The health care simulation domain.** The health care simulation domain coordinates institutional health care simulation experiences to support student interprofessional collaboration, learning, and assessment and to assist faculty IPE development efforts. It also highlights MUSC's significant health care simulation resources and, because these resources are tied to institutional efforts around clinical effectiveness and patient

safety, acknowledges a core motivating value behind interprofessional collaboration—quality care. Using on-campus health care simulation resources, interprofessional clinical skills workshops bring together students from different professions who learn about each other as they learn clinical skills common to all. The Simulated Interprofessional Rounding Experience was created for interprofessional student teams to round on a "patient," addressing medical and pharmacologic management as well as team communication. Faculty members who serve on this domain work closely with the curricular domain faculty to develop learning and assessment activities for students.

### Evaluating the C³ Initiative

We evaluate the C³ initiative at MUSC using measures that assess student progress on the four learning goals, domain outcomes, and the program in general. The student learning outcome measures address knowledge, skills, and attitudes related to interprofessional collaboration; these are linked to specific learning goals and, by association, to the conceptual foundation (Table 2). Students' attitudes toward interprofessional collaboration are assessed at matriculation and graduation using the Readiness for Interprofessional Learning Scale (RIPLS)[25] and the Interdisciplinary Education Perception Scale (IEPS).[26]

In addition, outcomes are associated with each domain. These include participant satisfaction, number of participants, and the diversity of represented professions for domain-specific activities. Presidential Scholars Program and IPE faculty development institute activities may include assessments of participants' attitudes using the RIPLS, the IEPS, and an MUSC-developed team skills self-assessment tool. General program evaluations address alumni's perceptions of their preparation for collaborative interprofessional health care delivery or research, as well as postgraduate employers'/program directors' assessment of graduates' collaborative skills.

The measures described above were initially outlined in the C³ plan. We subsequently developed additional evaluation activities to assess institutional

change; measures include faculty and staff attitudinal assessments using the RIPLS and IEPS instruments. Moreover, the existing student evaluations of courses and instructors, as well as faculty evaluations of department chairs and deans, have been revised to incorporate questions regarding interprofessionalism. More broadly, MUSC leaders have revised institutional goals and their associated measures to include IPE and collaborative practice. The range of these interprofessional outcome measures—from student-, course-, and program-specific to MUSC strategic planning and institutional assessment—highlights the desired culture shift toward IP collaboration.

## Conclusions

In this article, we have highlighted both known and new approaches to IPE by describing MUSC's commitment to the C³ initiative and its structured implementation. Our initiative shares several elements with other successful IPE efforts: institutional leadership and support,[7,8,13] broad-based faculty involvement,[8,13] assimilation into the organizational structure,[8,13] and shared space.[13] We have been guided, however, by the early development of our conceptual foundation and specific institutional learner goals; these direct our assessment of effectiveness, provide a common understanding of purpose and direction, and, when necessary, serve as reminders of what we need to accomplish. The implementation framework, which capitalizes on MUSC-specific features (e.g., health care simulation resources, existing extracurricular programs), promotes a comprehensive, multifaceted approach to embedding IPE within our institution's culture. We believe, though, that our implementation framework and established IPE activities can be generalized to other institutions.

Researchers and educators working at academic health centers must take the lead in implementing changes in health professions education. To successfully effect changes, health professions educators need to learn from each other and model among ourselves the interprofessional collaborative

approaches we espouse. We believe that our conceptual foundation of how health professions students progress through their education and how they develop teamwork competencies for interprofessional collaboration provides other educators with a model that can guide their efforts to develop IPE learning experiences for their students.

## References

1 Institute of Medicine. Health Professions Education: A Bridge to Quality. Washington, DC: National Academy Press; 2003.

2 World Health Organization. Working Together for Health: The World Health Report 2006. Geneva, Switzerland: World Health Organization; 2006.

3 Prevention Education Resource Center. Interprofessional education. Available at: http://www.teachprevention.org/interprofessional.php. Accessed February 3, 2010.

4 Association of American Medical Colleges. Learn, Serve, Lead: The Mission, Vision, and Strategic Priorities of the AAMC. Washington, DC: Association of American Medical Colleges; September 2007.

5 American Association of Colleges of Pharmacy. Task Force on Interprofessional Education 2007–2008. Annual Report. Available at: www.aacp.org/governance/councilfaculties/Documents/COF_InterprofessionalEducation2008.pdf. Accessed April 27, 2010.

6 Center for the Advancement of Interprofessional Education Web site. Available at: www.caipe.org.uk/about-us/defining-ipe. Accessed February 3, 2010.

7 Gilbert JHV. Interprofessional learning and higher education structural barriers. J Interprof Care. 2005;19(suppl 1):87–106.

8 Ho K, Jarvis-Selinger S, Borduas F, et al. Making interprofessional education work: The strategic roles of the academy. Acad Med. 2008;83:934–940.

9 Lavin MA, Ruebling I, Banks R, et al. Interdisciplinary health professional education: A historical review. Adv Health Sci Educ Theory Pract. 2001;6:25–47.

10 Davidson RA, Waddell R. A historical overview of interdisciplinary family health: A

community-based interprofessional health professions course. Acad Med. 2005;80:334–338.

11 Yarborough M, Jones T, Cyr TA, Phillips S, Stelzner D. Interprofessional education in ethics at an academic health sciences center. Acad Med. 2000;75:793–800.

12 Harward DH, Tresolini CP, Davis WA. Can participation in a health affairs interdisciplinary case conference improve medical students' knowledge and attitudes? Acad Med. 2006;81:257–261.

13 Mitchell PH, Belza B, Schaad DC, et al. Working across the boundaries of health professions disciplines in education, research, and service: The University of Washington Experience. Acad Med. 2006; 81:891–896.

14 Chessman AW, Bellack JP, Lahoz MR, et al. Students add value to learning organizations: The Medical University of South Carolina experience. Qual Manag Health Care. Winter 1998;6:38–43.

15 Ragucci KR, Steyer T, Wager KA, West VT, Zoller JS. The Presidential Scholars Program at the Medical University of South Carolina: An extracurricular approach to interprofessional education. J Int Prof Care. 2009;23:134–147.

16 Southern Association of Colleges and Schools. Principles of Accreditation: Foundations for Quality Enhancement. Available at: www.sacscoc.org/pdf/PrinciplesOfAccreditation.PDF. Accessed February 4, 2010.

17 Mezirow J. Perspective transformation. Adult Educ. 1978;28:100–110.

18 Mezirow J, ed. Learning as Transformation: Critical Perspectives on a Theory in Progress. San Francisco, Calif: Jossey-Bass; 2000.

19 Kegan R. In Over Our Heads: The Mental Demands of Modern Life. Cambridge, Mass: Harvard University Press; 1994.

20 Baxter-Magolda M. Creating Contexts for Learning and Self-Authorship: Constructive-Developmental Pedagogy. 1st ed. Nashville, Tenn: Vanderbilt University Press; 1999.

21 Baxter-Magolda M. Teaching to Promote Intellectual and Personal Maturity: Incorporating Students' Worldviews and Identities Into the Learning Process. San Francisco, Calif: Jossey-Bass; 2000.

22 Anderson LW, Krathwol DR. A Taxonomy for Learning Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York, NY: Longman; 2001.

23 White A, Kern D, Blue A, et al. Creating interprofessional teams. Acad Exch Q. 2008; 12:115–120.

24 Johnson AW, Potthoff SJ, Carranza L, Swenson HM, Platt CR, Rathbun JR. CLARION: A novel interprofessional approach to health care education. Acad Med. 2006;81:252–256.

25 Parsell G, Bligh J. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). Med Educ. 1999;33:95–100.

26 Luecht RM, Madsen MK, Taugher MP, Petterson BJ. Assessing professional perceptions: Design and validation of an interdisciplinary education perception scale. J Allied Health. Spring 1990:181–191.