

## **Professional Development for Community College Teachers: An Online Graduate Certificate Program in Community College Teaching**

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### **Abstract**

The departments of Adult and Community College Education (ACCE) and Mathematics, Science and Technology Education (MSTE) within the College of Education at North Carolina State University developed a prototype graduate certificate program in Community College Teaching. The program focuses on developing the knowledge and skills necessary to design and deliver course-related content through technology-enhanced learning environments for faculty who teach in Science, Technology, Engineering, & Mathematics (STEM) related areas. The courses developed for the graduate certificate enhance faculty abilities in both online and classroom environments. Current community college faculty from North Carolina and South Carolina have been recruited into the program. The project meets the broader goals of the NSF-Advanced Technological Education (ATE) program by institutionalizing the means by which working professionals can be recruited to fill shortages in community college faculty teaching positions in STEM fields. It also provides a means whereby current community college faculty can upgrade their instructional skills. The paper describes the online program and presents summary data from the first online course.

### **Introduction**

In order to meet the needs of current and future students and employers, technology must become an integral part of the system and culture of community college education. Community college faculty must be prepared to deliver instruction in flexible ways in order to meet the diverse needs of their students. In turn, students must not only be exposed to technology content within their chosen field of study, but they must also become experienced with instructional technologies used to deliver content at a distance. Unfortunately, the design and delivery of instruction at community colleges through technology-enhanced environments are in need of improvement<sup>1</sup>. One of the greatest needs among community college faculty is to develop proficiency in the knowledge and use of instructional technologies<sup>2</sup>.

In addition to the need for further developing knowledge and skills with instructional technologies, community colleges are also trying to keep up with the demand for workers in the areas of science, technology, engineering, and mathematics. Recently, a national survey by the American Association of Community Colleges revealed that ten of the fifteen degree programs ranked as having the highest probability of immediate job placement directly involved the development of specialized technology skills, and these programs are heavily dependent on mathematics and science backgrounds<sup>3</sup>. The remaining five programs (nursing, etc.) still remain heavily dependent on new technological innovations. In the South Central region of the United

States, four of the five programs most highly ranked for immediate job placement included computer technologies, radiology technologies, aviation, and computer-aided design. When combined with the increasing number of persons attending community colleges or universities in general <sup>4</sup>, these employment trends are placing enormous pressure on community colleges to deliver technologically intensive programs that are themselves accessible through technologically-enhanced environments <sup>5</sup>.

Since most community college students work full-time and attend school part-time, there is an urgent need to offer programs that are accessible at a distance through online technologies. Nationally, 53.8% of public community college students work full-time [and 47.9% attend part-time] and 44% work part-time <sup>6</sup>. These students are taking advantage of distance education. Moderately and highly nontraditional students are more likely than other students to participate in distance education and to be in programs available entirely through distance education. “Among all students who participated in distance education, 60 percent participated via the Internet <sup>7</sup>,” and by the end of the 2000-2001 academic year, “about half of all course enrollments in distance education courses were at public 2-year colleges <sup>8</sup>.” The importance for updating science, technology, engineering and mathematics content, the growing desire for distance education courses, and the increased necessity for community college faculty to develop knowledge and skills in instruction <sup>9</sup> and distance delivery <sup>10</sup> reflect a set of compelling needs for significant professional development outreach to community college faculty in the science, technology, engineering and mathematics areas.

In North Carolina and other states facing severe budget shortfalls, the pressure for technology programs is mounting at precisely the time that community colleges are seeing their legislative funding sources decline. In addition, a disproportionate number of community college faculty are nearing retirement age. Eighty percent of community college presidents reported that between 11-50% of their faculty would be retiring between 2001-2006 <sup>11</sup>. Thirty-six percent report that at least 25% of their faculty would retire during that period. In North Carolina alone, 21% of the full-time faculty employed in 1997 will have completed 30 years of service by 2006 <sup>12</sup>. While many faculty hires come from other community colleges, hiring trends indicate that 38% of new community college faculty will come from four-year collegiate institutions, as well as the business and health sectors <sup>13</sup>. Although these new instructors will bring with them content expertise, including science, technology, engineering, and mathematics content, most will have no coursework in curriculum design or in theoretically-driven strategies that promote the most effective student learning outcomes. The growing use and complexity of technologies in business and industry demand that learning designs for developing the much needed skills in these areas be effective, timely, and constantly updated. In addition, changes in accreditation are institutionalizing the expectation that all curriculum faculty have advanced degrees. National data indicate that 18.3% of full-time faculty and 30.6% of part-time faculty in community colleges have not earned a degree beyond the baccalaureate level <sup>14</sup>. In North Carolina, part-time faculty constitute 73.1% of the total faculty for the colleges. Thus, the need to improve the credentials of a sizeable faculty subset is increasing pressure on already short-staffed community colleges.

While there are some opportunities for community college faculty to gain degrees in instructional technology, technology education, or community college administration in the Mid-Atlantic States region, there are none that are systematically designed for community college instructors that emphasize distance delivery of science, technology, engineering, and mathematics content.

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Nationally, there are a few institutions now offering either community college teaching masters specialization, such as the University of South Florida, or a certificate, such as California State University at Sacramento. Most four-year institutions offer courses to develop and certify content expertise needed to qualify for community college instructor positions; however, the development of teaching expertise is only peripherally addressed, if at all. Community colleges, as well as the state system offices, support a variety of instructional development activities. These current faculty development efforts are excellent, but are limited because of the inability to offer a systematic set of offerings based in a designated set of instructional development competencies. In North and South Carolina, administrators in the state system offices and many of the community and technical colleges have expressed a need and support for courses and workshops on instruction. Graduate courses delivered through distance education are especially needed, as well as courses that provide opportunities to science, technology, engineering, and mathematics faculty to develop their own skills in the design and instruction of online community college courses.

### **Project Overview**

The departments of Adult and Community College Education (ACCE) and Mathematics, Science, and Technology Education (MSTE) at North Carolina State University within the College of Education at North Carolina State University are working together to offer a prototype Graduate Certificate Program in Community College Teaching. The program focuses on developing the knowledge and skills necessary to design and deliver course-related content through technology-enhanced learning environments for faculty who teach in STEM (Science, Technology, Engineering, & Mathematics) related areas. The courses developed for the graduate certificate enhance faculty abilities in both online and classroom environments. Current community college faculty from North Carolina and South Carolina have been recruited into the program.

The project meets the broader goals of the Advanced Technological Education (ATE) program by institutionalizing the means by which working professionals can be recruited to fill shortages in community college faculty teaching positions in STEM fields. It also provides a way for current community college faculty to upgrade their instructional skills. As interest in STEM related programs grows among the community college student population, the hope is to foster greater faculty development. The Graduate Certificate Program in Community College Teaching strives to reach these current and aspiring faculty members through distance education, strengthening the services the community college provides.

### **Project Goals**

The key goal for the online Community College Teaching certificate program is to provide high quality content and instruction for the systematic development of instructional expertise for regional community college instructors. Instructional goals for the program include:

1. Developing the key knowledge and skills regarding the adult learning, instructional strategies, and the nature of a supportive learning community classroom instructional environment.
2. Enhancing skills and adapting classroom design, instruction, and evaluation in disciplinary content areas.
3. Gaining knowledge and skills for critical decision-making in the necessary adaptations of classroom activities for diverse students who represent diverse contexts.

## **Core Courses**

The first three courses provide an introduction to instructional techniques and technologies as well as lay a foundation for further program options. These courses represent conceptual and technological content that provide learners with knowledge and skills necessary for conducting a variety of approaches to teaching while emphasizing the use of technology in instruction. In addition, courses in the certificate program provide knowledge and skills useful for the design and delivery of content in distance, and in particular, web-based learning environments.

*The Adult Learner* – This course focuses on the under girding principles in adult education programs including theories and concepts. Emphasis is placed on the interrelationship of the nature of adult learning, the nature of the subject matter and the setting for learning occurrence. The applicability of relevant principles and pertinent research findings to adult learning are discussed in the course.

*Instructional Strategies in Adult and Community College Education* – This course covers the forms of instruction appropriate for the teaching of adults. Special emphasis is placed upon the methods for maximum involvement of the adult learner. Students study the relevant concepts, theories and principles for selection, utilization and evaluation of instructional strategies with focus on integration of theory into practice. Students develop proficiency in use of applicable teaching techniques for adult and community college education through participation in online and classroom practice exercises.

*Instructional Design in Technical and Technology Education* – This course involves creating instructional activities for technical and technology education settings. Students examine learning theories appropriate for technical and technology education and explore and apply models for instructional design. Issues relative to electronic applications in technical and technology education classrooms are also explored.

## **Certificate Options**

After completing the 3 core courses, students will make a decision whether to pursue the community college teaching certificate or to apply to a master or doctoral program (see Figure 1). If they elect to only complete the certificate, they will have to complete 2 approved courses from the ACCE and/or MSTE departments. If a student wishes to continue on to complete a graduate degree, application must be made to the appropriate department. All core courses in the certificate program transfer into either department.

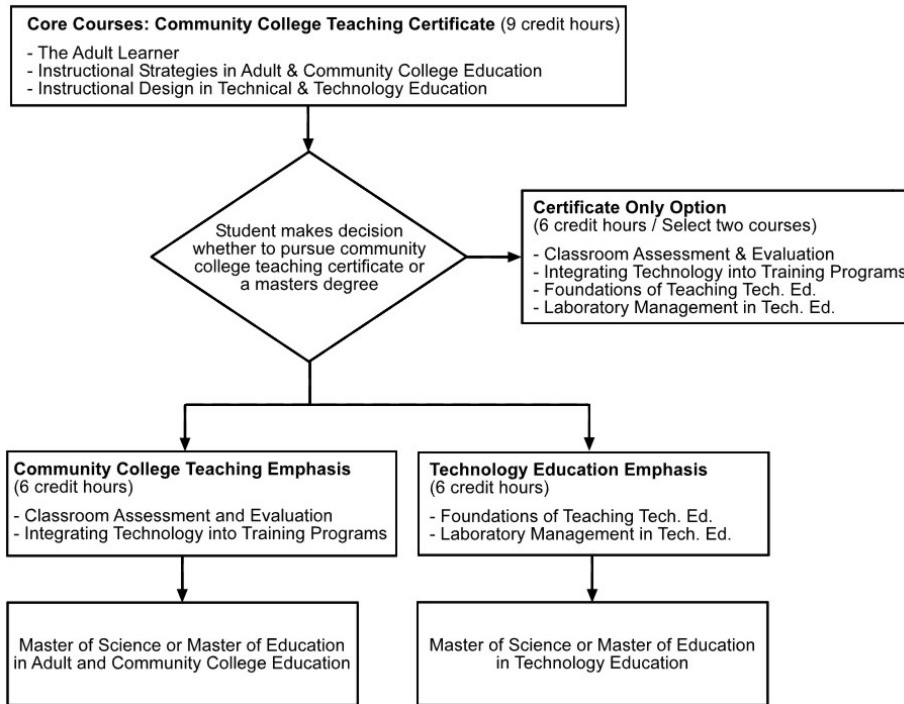


Figure 1. Flowchart for Community College Teaching Certificate.

### Current Participants

The Community College Certificate Program currently has 14 participants from 12 institutions in North and South Carolina (see Figure 2). The participants are community college faculty in the following areas of study: anatomy & physiology, biology, chemistry, civil engineering technology, civil engineering & surveying technology, computer programming, developmental arithmetic & algebra, distance learning, geology, industrial systems technology, laser & photonics technology, and mathematics & science. A majority of the participants already have master degrees in their content area.

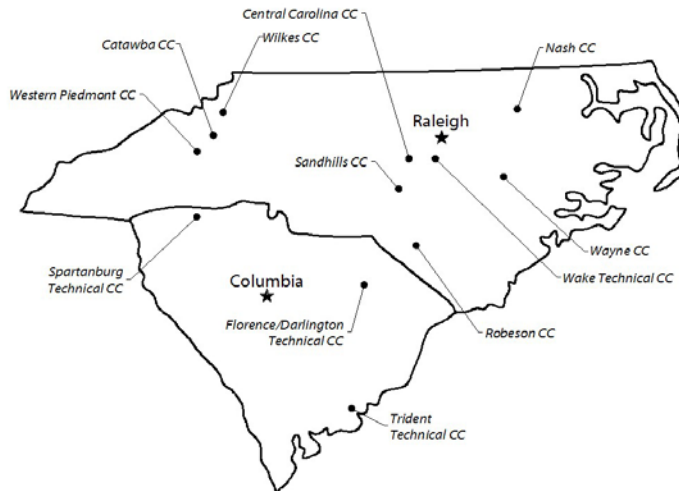


Figure 2. Map of Participants' Locations.

## Advisory Committee

The advisory committee for the project is comprised of administrators from both North and South Carolina. The committee includes two community college presidents, two administrators from the state systems, three university administrators who specialize in distance education programs, two community college vice presidents in charge of curriculum, and two community college department heads.

## Delivery of Course Content

All courses are being delivered through WebCT. Figure 3 shows the WebCT interface for the Adult Learner course. Before beginning the course, students were asked to complete an "Online Preparedness Guide Quiz" to determine their readiness for the online course. One of the biggest concerns for all faculty involved in the project is that the online learning experience is as good as or better than a traditional classroom experience. Traditional face-to-face courses involve having students complete required reading assignments before coming to class and then participate in classroom discussions. For the Adult Learner course, students were required to watch a short video (3-4 minutes) of the instructor introducing the material for the week before completing readings that were on E-Reserves. Additional assignments for units involved posting original ideas on the course discussion board, writing papers, and participating in synchronous web activities.

The screenshot shows the WebCT interface for the course "The Adult Learner" (EAC 759). The top navigation bar includes links for MYWEBCT, RESUME COURSE, COURSE MAP, RESOURCES, LOGOUT, and HELP. The left sidebar contains a "Hide Navigation" button and a "Control Panel" with options like "Visible to Designers", "View Designer Map", "Add Page or Tool", "Manage Files", "Manage Course", "Change Settings", and "Content Assistant". Below the control panel is a "Course Menu" with links to "Homepage", "Course Contents", "T&D Library", "Discussion Board", "Chatrooms", "Calendar", "Group Lockers", "Homepages", "Gradebook", and "Whiteboard". The main content area features a banner for "The Adult Learner" with the course ID "EAC 759". Below the banner is a welcome message: "Welcome to EAC 759: The Adult Learner. To get started in this course, follow the 'Course Contents' link and read the 'Welcome Page.' This page will direct you to the next steps in the course, including the location of the syllabus and first learning unit." A grid of course activities is displayed, including "Course Contents", "Discussion Board", "Group Lockers", "Whiteboard", "T&D Library", "Chatrooms", "Calendar", "Gradebook", and "Online Preparedness Guide Quiz". The NC State University logo is visible at the bottom.

Figure 3. WebCT Interface for The Adult Learner Course.

## Evaluation

Since the Online Graduate Certificate Program in Community College Teaching is funded by the National Science Foundation, the program must be evaluated by an outside agency. The external review for this project is being conducted by the Research Triangle Institute (RTI). RTI will conduct electronic skill inventories during each course, review portfolios of student work, collect and analyze contact logs between students and faculty, review recruitment plans, and review curriculum materials from each course.

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Ted is an assistant professor of Graphic Communications at North Carolina State University and has been an ASEE member since 1987. He has taught courses in introductory engineering graphics, computer-aided design, descriptive geometry, instructional design and course design. Ted has a bachelor of science in Technical Education, a master of science in Occupational Education, and a Ph.D. in Curriculum and Instruction. His current academic interests include spatial visualization ability, geometric dimensioning and tolerancing, constraint-based modeling, graphics education, and online instruction.