Advancing Careers in Information Science and Technology

by Wilbur W. Stanton, D.E. Templeton, J.D. Chase, Melinda Rose, and Carlotta Eaton

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Abstract
The authors discuss the joining of 12 Virginia community colleges from the Appalachian region of southwestern Virginia with Radford University to form the Regional Technology Education Consortium (RTEC), a three-year project funded by the National Science Foundation Advanced Technological Education program and designed to develop articulation agreements, influence the development of new curricula, provide faculty development opportunities, share curricula through distance education, and provide collaboration in student advising and career placement.

Early in 2001, Virginia was experiencing a growing crisis due to lack of qualified information technology (IT) workers. The Virginia Commission on Information Technology stated, "even if the education and training providers could magically produce 30,000 fully trained new IT workers in the proper categories and numbers tomorrow, the Commonwealth's IT worker shortage would not be totally eliminated" (Governor's Commission on Information Technology, 1999). In 2003, the Virginia Employment Commission stated that out of over 700 job titles the most needed included computer support specialists, computer engineers, system analysts, and database administrators to support the growing demands of the Virginia IT industry.

Further complicating the ability to train highly qualified IT workers has been the traditional difficulty of transferring Associate of Applied Science (AAS) credits from a community college to institutions granting baccalaureate degrees. Like many other states, Virginia recipients of two-year AAS degrees have often lost many credits in the transfer process, requiring them to spend additional time in school to complete a baccalaureate degree.

The Commonwealth of Virginia reacted to this situation by encouraging the development of collaborative relationships and articulation agreements among two-year and four-year institutions to develop and offer accelerated Bachelor of Science (BS) degree completion programs for AAS-IST community college graduates (Governor's Blue Ribbon Commission on Higher Education, 2000).

Project Building

The National Science Foundation proposal and the concept for the Regional Technology Education Consortium grew out of semi-annual partnership meetings held between Radford University (RU) and community colleges in southwestern Virginia – and out of earlier work on the problem of articulation in IT between RU and New River Community College.

Since the beginning of this partnership, we had already realized several collaborative successes between RU and regional two-year colleges. These included

- 2+2 articulation agreements (operational for over five years) in the areas of criminal justice, accounting, management, human development, social work, and nursing, between RU and Virginia Western Community College,
- a Bachelor of General Studies articulation agreement for a concentration in computer science and communication, between RU and New River Community College,
- a teacher education project with Wytheville Community College, and
- guaranteed admissions agreements between RU and five regional community colleges.

Responding to the demand for trained IT professionals, Radford University initiated a new academic college in 2001. The *College of Information Science and Technology (CIST)* was formed by merging two existing programs: Computer Science and Information Systems into one academic unit that is dedicated entirely to information technology.   Faculty from both programs had already been working on the problem of articulation, and a central component of the mission of the College was to work as a partner with Virginia regional community colleges in providing accelerated baccalaureate degree completion alternatives for Virginia AAS-IST graduates.

Project Model

Through funding assistance from the National Science Foundation ATE program, the Regional Education Technology Consortium (RTEC) aspires to ease the transfer of IT students from the VCCS to Radford. In the process, a model will be developed to that could be applied to any two-year and four-year institution partnerships.

The RETC partnership between Radford and regional Virginia community colleges was initially conceived by Dr. Wilbur Stanton, founding dean of the new College of Information Science and Technology. It has four definitive strands or tracks, each of which has a development team that is comprised of faculty and administrators from RU and five core regional community colleges. (As the project evolved the remaining colleges were integrated into the consortium over a three-year period.)

The four strands are:

- *Curriculum Development:* insure a curriculum that is current, meets industry expectations, and engages students in learning and discovery.
- *Development of Articulation Agreements:* facilitate accelerated baccalaureate degree completion for AAS graduates by providing 2+2 articulation agreements between community college consortium members and RU.
- *Collaboration Between Consortium Members and Regional Employers:* stimulate job placements and internship opportunities throughout the region.
- *Development of a Supportive Distance Learning Infrastructure:* develop an efficient and integrated distance education network among consortium institutions.

Our overreaching goal is to increase the quantity, quality, and diversity of trained professionals in computer science, information systems, and information technology throughout the Appalachian region of southwestern Virginia.   Our supporting goals of the project are to

- provide a clear path for AAS students to obtain a four-year degree in computer science (CS) or information technology (IT),
- develop CS/IT curriculum to meet academic standards and industry technology requirements,
- nurture and develop articulated programs and agreements,
- evelop institutionalized procedures to guarantee continued congruence between community college and four-year institutions, and
- encourage AAS degree track students to complete two-year degree program before transferring to a four-year degree program.

RTEC Team Building

We five participants from Radford University (Wilbur Stanton, Joe Chase, Kathy Jordan, Dennie Templeton, and Melinda Rose) were joined by the core of IT and CS faculty and administers from the four core regional community colleges (Bob Clary from Patrick Henry CC, Valerie Bird from Wytheville CC, Carlota Eaton from New River CC, Diane Wolfe and Ramona Coveney from Virginia Western CC; Bob Miller from Piedmont CC was added to the core team after the first six months).

Our core group laid the groundwork for the RTEC using the original CS/IT articulation agreements formally signed in 2002, when the presidents of New River Community College and Radford University signed two articulation agreements that provided admission to RU bachelor of science degree programs. (The first meeting of the RTEC team members had occurred in October 2001 at the RU and Virginia Regional Community College presidents meeting; this forum allowed regional community college presidents to be briefed on the project while providing a forum for the RTEC members to identify the objectives for each strand.)

RTEC team members continued to meet throughout the first year through regional site meetings, teleconferences, and audio conferences. Along with the core teams, initial RTEC regional Virginia community college members are Virginia Highlands, Southwest Virginia, Central Virginia, Mountain Empire, Danville, and Dabney S. Lancaster, and Blue Ridge Community Colleges.

Outcomes and Observations

Early into the first year of the project, the RTEC realized that it had the potential to have an even larger regional impact on Virginia and the southwest region than initially intended. After the project was underway, the core members used various dissemination outlets within the state and region to inform educators and state leaders of the potential of collaborative partnerships between two- and four-year institutions.

One of the most significant achievements of the RTEC project to date has been the extraordinary cooperation of IT faculty from the VCCS and from RU in the area of curriculum development. This cooperation has yielded significant benefits that have accelerated the development of articulation agreements.   Further, this cooperation has led to the inclusion of RU faculty in the creation of a new master IT course list for the VCCS (published in 2004) as well as new model curricula in IT, which are currently under development. Since these curricula will be based upon the Association for Computing Machinery (ACM) CC 2001 – the same curriculum outline used by RU and other four-year schools – articulation of these model curricula will be much more easily achieved.

As V. Bird, the IT chair from Wytheville CC, expressed it, "The RTEC project has been a wonderful opportunity for Virginia Community Colleges and, in particular, Wytheville Community College (WCC) IT graduates. The articulation agreement with Radford University means community college IT students can take WCC courses and begin as juniors at Radford University. This gives community college students the choice of attending a community college and moving on to a four-year college to earn a Bachelor of Science degree" (Bird, 2003).

The RTEC also realized that there were policies and roadblocks that hindered the evolution of the strands but through examination and cooperative discussion, initiatives could be applied to open forums of change.

Opportunities for VCCS Faculty

Through the partnerships within the RTEC, professional development opportunities have evolved for VCCS and RU faculty. Three faculty team members attended the 2003 ACM *Special Interest Group on Computer Science Education* (SIGCSE) conference. SIGCSE also accepted a seven-person presentation by the RTEC core group to present at their 2004 March conference in Norfolk, Virginia. This provided an opportunity for community college and university faculty to address articulation and curriculum development projects in other states within an international forum.

The RTEC has also been publicized at regional community college meetings, presentations at the 2003 and 2004 VCCS New Horizons Conference in Roanoke, a presentation to the Cooperative Education Internship Association in 2003 in Nashville, and additional presentations and meetings at the National Science Foundation Primary Investigator conference held by the National Science Foundation and the American Association of Community Colleges (AACC) in Washington, D.C. for each of the last two years. The NSF and AACC conferences were especially helpful to the development and the partnership of the RTEC team members and provided guidance in the management of the project.

Expanded Outcomes

A need that emerged from regional meetings and conferences with VCCS participants during the first year were requests from community college faculty for expanded opportunities for professional development – specifically, for IT master's level coursework. This led to the first three-day technology summer institute held at Radford University for 18 Virginia regional community college faculty and RTEC team members.

The course awarded two hours of graduate IT credit in information technology to the VCCS faculty members as well as provided a forum for discussing CS and IT curriculum. The institute also allowed the RTEC members to explore new ways to expedite the expansion of the project to include the next level of community college participants.

The strand meeting groups also identified the need for more graduate-level courses and programs for Virginia community college and K-12 educators. In response, the RU College of Information Science and Technology and

College of Education founded a master's level program addressing the needs of both community college and K-12 faculty. The new concentration in information technology within the Master of Science in Education program is a 36-hour program providing 18 hours in IT and 18 hours in education coursework; it began accepting students in the spring of 2004.

In the summer of 2004, Radford University and the regional Virginia Community College RTEC project jointly sponsored this year's Virginia/Maryland/Washington, D.C. Working Connections 2004 Summer Training Institute, which was held at Radford. The partnership between RU and the VCCS combined multiple resources to provide community college faculty with both professional development training in technology applications and master's level courses in Java and Networks. The institute not only provided an opportunity for face-to-face collaboration of VCCS faculty and RU faculty but also provided a venue for graduate course work for VCCS IT faculty.

Professional development opportunities for VCCS IT faculty will expand again at the third institute at RU slated for the summer of 2005.

Future Developments

Building on the accomplishments of the Regional Technology Educational Consortium, our team will submit an extension proposal request to the National Science Foundation for 2005 to expand and implement a second phase of the current NSF Advanced Technological Education (ATE) grant.

If funded for this expansion, the RTEC consortium will build on the current model between RU and 12 regional VCCS colleges and expand participation to a total of 23 Virginia community colleges. The proposal will provide extended articulation model development and an emphasis on providing expanded professional development opportunities through summer conferences and partnerships with Virginia community colleges. Models and publications developed through this partnership will provide an articulation "road map" for any two and four-year institutions seeking to expand educational choices.

A recent publication, *A Transfer Students Guide to Colleges and Universities (2003,)* encourages students to "make sure they develop a personal plan of action for success including early planning for transfer through articulation agreements to a four-year institution" (Key, 2003). Likewise, four-year and two-year educational institutions need to develop a plan to meet the needs of their students.

Through the National Science Foundation's ATE grant funding and the collaborative efforts of all RTEC members, the RTEC project has provided a much-needed CS and IT model for two- and four-year educational institutions in the southwest region of Virginia. Through this collaborative endeavor, other four-year institutions may develop or expand partnerships with Virginia Community Colleges – partnerships that can benefit all institutions and contribute to educational choices and opportunities for both Virginia educators and students.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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