
**AC 2012-3815: IMPLEMENTATION OF LOW-RESIDENCY DELIVERY
OF A BSEET ARTICULATION PROGRAM**

Prof. Pamela S. Frinzi, Southern Polytechnic State University
Mr. Scott Larisch, Southern Polytechnic State University

**Implementation of Low-Residency Delivery of a BSEET
Articulation Program**

Abstract

Southern Polytechnic State University (SPSU) has implemented a system-wide articulation with the Technical College System of Georgia (TCSG). This articulation will provide the opportunity for SPSU to offer a Bachelor of Science Electrical Engineering Technology (BSEET) degree on a statewide basis, with the TCSG institutions as our partners. The TCSG institutions will offer roughly the first two years of the program, including some of the general core. Our department will offer the last two years of the program online.

One of the goals of the articulation agreement was to reach the non-traditional students who would be unable to attend SPSU due to reasons such as living too far from campus, jobs, family, etc. This required the development of on-line versions of the courses in the last two years of our program, including both lecture materials and laboratories.

Initially, the courses offered at SPSU will be in a format in which most of the content is offered online, with laboratories being offered in a ‘low-residency’ format. This low-residency format will require students to complete a group of laboratory assignments on two or three Saturdays during the semester. We anticipate future efforts to offer both the lectures and laboratories completely online.

SPSU’s approach, in collaboration with the TCSG, to the development of these courses was to require consistency in the format of each of our courses by implementing a standard template. This will facilitate courses to have the same look, feel, tools, and structure. Faculty developing these courses must have completed our Teaching Academy for Distance Learning (TADL) training course prior to writing courses. To ensure quality course development and structure, each course is submitted to a third-party instructional evaluation team and assessed to a high standard rubric.

This paper will focus on the actual tools used in developing the instructional materials for the lecture portion of the courses, including the instructional technologies used – Vista, Echo 360, Camtasia, and Podcasting. We will also describe many of the teaching and learning strategies necessary for successful remote delivery, including innovative ways to engage online students. These include question and answer components, discussion postings, collaboration among students, and opportunities for further study.

The paper concludes with an assessment and future plans for development.

Introduction

Today's business must apply technology in every way imaginable. That's why at Southern Polytechnic State University (SPSU) students study the sciences and technologies in a unique, practical manner that provides an education that is career-based and balanced.

SPSU is a residential, co-educational member of the University System of Georgia (USG). Located on 203 acres of naturally wooded landscape in Marietta, Georgia, we are just 20 minutes from Atlanta. Approximately 5,500 students study here, including student representation from 36 states and 64 countries.

We are proud to be Georgia's technology university. Our academic, professional, outreach, and service programs embrace all aspects of technology, including the practical applied skills (*techne*) needed to solve today's real-world problems and the theoretical knowledge (*logos*) necessary to meet tomorrow's challenges. Our graduates are well prepared to lead the scientific and economic development of an increasingly complex state, nation, and world.

Our mission is to serve both traditional and non-traditional students at the undergraduate, graduate, and continuing education levels; in engineering and engineering technology, the sciences, applied liberal arts, business, and professional programs. We work to develop the broader community's intellectual, cultural, economic, and human resources. Facilitated by our innovative faculty, dedicated staff, and supportive campus environment, our learning community empowers our students with the ability and vision to transform the future.

SPSU is a place where students are educated for life and for leadership in an increasingly technological world. We prepare our students for their very first job after graduation, with the skills that make them highly marketable and successful. We feel it is just as important that our education also prepares students for the last job in their careers. Thus, our courses and programs are structured to enable men and women to adapt, grow, and continue to learn over the years, developing the leadership skills needed to implement the vision of a technological future.

Students at SPSU learn skills beyond the essential technological and scientific knowledge that qualifies our graduates to contribute to some of the fastest growing fields in the nation. They also learn traditional liberal arts skills that enable them to learn to think critically, communicate clearly and persuasively, solve problems collaboratively, and develop an international perspective in an increasingly global marketplace.

SPSU offers online and blended learning delivery options for many of our programs and courses. Our first online program, a Master of Science in Quality

Assurance, was offered in 1997, and we continue to expand our online program and course offerings.

SPSU has instituted an articulation program with the Technical College System of Georgia (TCSG). Students that have earned an Associate of Applied Science (AAS) from a TCSG institution, are now eligible to earn one of the following Bachelors of Applied Science (BAS) degrees from SPSU:

- BAS in Information Technology
- BAS in Manufacturing Operations
- BAS in Supply Chain Logistics
- BAS in Business Management

We strongly encourage TCSG graduates to consider additional educational opportunities at SPSU. While many career opportunities will be available to graduates with a TCSG degree, we believe that adding a Bachelor's degree will enhance their career choices even further. For this reason, we have developed several pathways from selected TCSG AAS degrees into related Bachelor's degrees at SPSU. More importantly, these pathways will fully utilize the AAS courses that students have taken at the TCSG by fully transferring them into the BAS programs.

The TCSG and SPSU have worked together to align our curricula so that students will experience a smooth and comfortable transfer from the TCSG to SPSU. In addition, our coursework will be available to students completely online in a 'low-residency' format which may require that they attend labs at our campus or a regional site one or two weekends during the semester (not all BAS degrees require labs). These programs are designed to allow the student to complete their Bachelor's degree without having to leave their current employment or disrupt their family in the process. Naturally, students living within convenient driving distance of our campus may also take the courses on campus.

Three BS Articulation Programs are available now. Note that students must have earned their AAS degree in one of the TCSG programs identified below.

- **BS in Mechanical Engineering Technology (BSMET).** Students must have earned an AAS degree in Pre-Engineering Technology to be eligible for the BS in Mechanical Engineering Technology.
- **BS in Electrical Engineering Technology (BSEET).** Students must have earned an AAS degree in Pre-Engineering Technology to be eligible for the BS in Electrical Engineering Technology.
- **BS in Industrial Engineering Technology (BSIET).** Students must have earned an AAS degree in Pre-Engineering Technology to be eligible for the BS in Industrial Engineering Technology.

SPSU provides technology that allows students to become engaged in our online learning community. We currently use Blackboard Vista 8 as our Learning Management System, which is the technology that is the backbone of our online learning courses. Depending on the program or course, students may also use our synchronous (real time) meeting technology (Blackboard Wimba). Instructors may make use of podcasts (video or audio), streaming video, and even interactive flash animations or other multimedia technology in their classes. Students have access to our campus library and other campus-based network services online, including online library materials. Students can connect with student organizations via the OrgSync system, and students and alumni can learn about career services.

We also have a website with resources for adult students and those who are in or have served in the military.

Development of Instructional Materials

Our Teaching Academy of Distance Learning (TADL) is a 47 hour three-part training program for our faculty that is designed to provide:

- Training in online course development concepts,
- Training on Vista 8 common tools as well as other instructional tools,
- Guidance and advice regarding online course development processes, and
- Staff assistance in lab sessions as you develop/revise a course.

TADL is designed to provide instruction and assistance to faculty wishing to get a complete overview of distance learning course development and related teaching concepts. TADL is more than tools training. TADL includes online teaching concepts, pedagogy, tools training (including Vista 8, Wimba Classroom, Camtasia, Respondus quiz builder, Podcasting Server, etc.) and individualized assistance with course development/revision.

An initial eight-hour course provides the conceptual framework for online instruction including the philosophy and pedagogy related to teaching online rather than in class. Participants will complete a course plan for developing and revising a specific class for online instruction.

The next 30 hours focus on eight of the critical tools in Vista designed to provide instruction, practice and application of these tools in developing an online course. Participants will implement the course plan they developed in TADL Part 1 and effectively use the use the Vista tools as well as other online technologies and methodologies to implement.

The last nine hours of TADL focuses on applications-based workshops. Staff will

be on hand to assist participants in applying Vista and other support tools to complete their online course development. Participants will complete designated milestones that will help them with the development of their course. Along with mandatory attendance for face-to-face meetings, there will be an ongoing asynchronous online component that encourages participants to reach milestones in the course development process. Additionally, TADL instructors will be available for synchronous online office hours for 3 hours each week. Participants will relate their progress and receive feedback regarding each milestone in TADL through online discussion.

SPSU's distance learning efforts and student enrollment have expanded at a rate of 33% each year from 2007 to 2010. Distance courses are 17% of the credit hours at SPSU. This reflects a phenomenal growth rate that does not include the tremendous expansion of hybrid course offerings throughout the same period. We currently offer 28 certificates and degrees online. Future plans include development of at least 4 new online programs in the next two years.

SPSU has faculty that do an excellent job in developing and offering online classes. As existing programs expand and new programs come online, more faculty members are now being called upon to develop and teach online courses. It is imperative that all faculty members have the opportunity to attain the knowledge and skills necessary to develop and deliver excellent online instruction.

Instructional Technologies

SPSU has purchased and made available several software tools to assist faculty in creating better online courses. Each course is designed such that faculty other than the course developer can easily navigate and teach the course. Classrooms have been developed and outfitted with the necessary equipment to facilitate in-class learning as well as on-line student participation.

Wimba Live Classroom is a fully-featured, live, virtual classroom solution that includes audio, video, chat, application sharing and content display. It is a tool that enables instructors to create an efficient on-line class that is more interactive with their students. Our Instructional Design Team has developed detail instructions and short-courses for learning the various components available within Wimba. One of the features we feel is very beneficial to all students, both those attending online, as well as those attending in person, is the ability to archive each lecture and make those archives available for students to watch as many times as they need. This ends up being a popular and invaluable study tool.

Wimba Create allows quick and easy conversion of Microsoft Word documents into content for online courses. It will generate a set of webpages from a Word document that includes navigation and interactive features that are easy to

upload to the course. The security settings are easily accessible and may be changed by the instructor teaching the course.

Wimba Voice Board allows instructors to create threaded voice discussions for their courses. These are great for brainstorming and collaborating between instructors and students.

Camtasia is a screen video capture tool for creating screen capture movies, narrated Powerpoint presentations, training videos, etc. It allows instructors to record exactly what is on the screen, including the instructor's voice, and then finally create the finished product: a narrated presentation with the screen capture movie.

The *Echo360* system captures and publishes lectures, tutorials, and other instructional materials by faculty. It then provides an on-demand Internet viewing service for students. This system captures lectures digitally in real-time, using video and /or audio and then provides links for the instructor to deliver the content to the students. We have dedicated classrooms set up for *Echo360* delivery.

Impatica transforms a Powerpoint file into a much smaller secured file ready to publish in Internet presentations including Vista, e-mail, etc. The *Impatica* file is typically compressed and hence significantly smaller than the usual Powerpoint file, providing a significant reduction in download time.

Respondus is a powerful tool for creating and managing quizzes, exams, or surveys that can be printed to paper or published directly in Vista. The tool includes the ability to import questions from either MS Word or NotePad format. Once a quiz or exam is created, *Respondus*'s exam wizard creates an assessment in minutes.

Turnitin is an online tool to help faculty check students' work for improper citations or potential plagiarism by comparing it against continuously updated databases. An originality report provides instructors with the opportunity to teach their students proper citation methods as well as to safeguard their students' academic integrity.

Podcasting is also a tool available to add to a course by adding an actual Podcast Channel. This allows sharing of audio or video digital media files by instructors and students.

While there are other instructional technologies available to faculty, the ones discussed here are most commonly used.

Student Success Strategies

While online courses offer easy accessibility for students to take courses at a campus that is not in their local area, success in these courses may be more difficult than when attending class in person. There are many factors that are critical to ensuring an online student's success.

In 1987, Chickering and Gamson developed the 7 Principles of Good Teaching¹ as a result of over 50 years of research. They are based on a learner-centered approach that suggests students learn best when:

1. They talk about their learning and apply it.
2. They receive frequent timely feedback.
3. They are able to learn in a variety of ways.

Our goal is to take the 7 Principles of Learning and come up with strategies to accomplish these in online delivery.

Principle 1 – Encourage Student-Faculty Interaction. This the most important factor in learning. Student motivation comes mainly as a result of communication and interaction with their instructor. It enhances their commitment to the course and encourages them to think about their plans. In the traditional classroom, this is easy. However, different approaches need to be taken in an online class. We have tools built into our online classes to facilitate this interaction. One, for example, is a video introduction that is made available online. The instructor would typically send students an email a week in advance of the class with a link to the video. Another method of interaction is for the faculty to clearly state their email policy in the syllabus, e.g., availability on weekends, maximum response time to an email. We also conduct online office hours using Vista, which allows real-time responses.

Principle 2 – Encourage Student-Student Interaction. One of the best ways to deepen the understanding of something is to explain it to someone else. Working with others stimulates ideas, questions, reactions, and disagreements. It improves their overall thinking and learning experiences. There are a number of ways to accomplish this in the traditional classroom. We need different tactics in the online environment. One of the first things we do in online classes is to have an icebreaker discussion assignment. This helps students to get to know each other. Creating a place for students to engage in non-course related chats fosters an environment similar to gathering in the lobby before class.

Principle 3 – Encourage Active Learning. Students typically do not learn by sitting, listening, and memorizing information. In many cases, active learning takes place outside of the classroom with homework assignments. In addition, for courses in our programs, they need to reinforce the materials learned in class by performing experiments in the laboratory. In our online courses, one of the tools we use is the assignment tool to create and receive assignments. Wimba

LiveClassroom can be used to provide structure for students to give real-time presentation and demonstrate laboratory assignments.

Evaluation Rubric

As part of SPSU's Quality Enhancement Plan (QEP), we want to achieve a consistent course evaluation process. Our instructional design team has developed a Distance Learning Standard Rubric by which all online course offerings will be assessed.

The components of this rubric are as follows:

- There are 43 elements (some required and some recommended) divided among 7 major sections. Required and recommended are terms used by the Rubric in order to nominate courses for internal and external award programs for online design, as well as satisfying contractual agreements with the Distance Learning Task Force (DLTF).
- There are 7 Sections, each of which has two required elements that are required to receive a rating of 4.0 or higher on a scale of 1-5. The Rubric allows for exceptions with written justification of how the elements are addressed through alternative means.
- Of the 29 Recommended Elements, a course **should** contain at minimum 20 Recommended Elements and an overall rating on the Recommended Elements employed of 3.5 or higher. There is no minimum required rating for any one Recommended Element; however, those that fall below 3 are better removed from the course or improved immediately. The Rubric allows for exceptions with written justification of how the elements are addressed through alternative means.
- There is a Simplified Checklist to aid faculty during the course development process. However, this checklist does not replace the Standard Rubric.

Assessment of the Course

The Teaching Academy for Distance Learning (TADL) borrows from the success

of the our Teaching and Learning Academy of 1996-98 and customizes that concept to concentrate on online development.

While we have offered online classes since 1995 and our first online degree (MSQA) was initiated in 1997, there has always been a commitment that our online efforts will meet high standards. In the summer of 2003, a DLTF-funded project had two faculty members develop an assessment instrument by which our online courses can be evaluated. The assessment instrument was further refined and improved over the following two years. The instrument that exists today has two parts: the Instructional Design Assessment and the Content Assessment.

The first-phase of Instructional Design Assessment is completed by an outside assessor. The second and third phases of Instructional Design Assessments are completed by instructional design staff in ASC. All courses must receive at least a 4.0 on a 5 point scale, include no "Not Evident" ratings and include an Instructor's Manual to successfully complete phase 1 of the Instructional Design Assessment.

The Content Assessment may be completed by the Department Chair, Dean, or by an outside content expert. The assessment is on a 5 point scale. All courses must receive at least a 4.0 to successfully complete the Content Assessment. Courses may not be scheduled to be taught until they meet the 4.0 minimum assessment score on both the Instructional Design and Content Assessment and complete through phase 2 of the Instructional Design Assessment.

Future Plans

SPSU plans to continue assisting the technical colleges in improving their student success in our programs by providing feedback and suggestions to make necessary changes to their programs. It is our eventual goal to take the program from a 'low-residency' delivery to a 'no-residency' delivery.

We will be exploring tools and techniques to develop our laboratory component of the course so laboratories may also be performed in an online environment. We envision this as freeing up current lab space for more specialized lab equipment. Instead of outfitting labs with 8 oscilloscopes, 8 power supplies, 8 digital multi-meters, and 8 function generators, for example, we would be able to use that space and budget for one high-end biomedical instrument. This approach will eventually enable us to develop specialized power and communication labs.

Finally, by creating a 'no-residency' program, we will be able to offer our programs to active military serving our country both in the U.S. and overseas.

We have always strived to accommodate our military and this will allow a student that is currently enrolled to continue progressing toward their degree when called to serve elsewhere.

Summary

The development of the articulation agreement with TCSG institutions provides the opportunity for graduates of 2-year colleges to complete their BSEET in a 'low-residency' format. This will enable the non-traditional students to further their education without having to relocate, quit their job, etc. Offering this program has required the development of online versions of the last 2 years of our program, as well as modification of our labs. SPSU has been offering online courses for many years giving us the necessary experience to develop the program.

SPSU's approach to the course development was to require a consistent format for each course using a standard template. This allows the courses to all have the same 'feel' for the students as well as the instructor. Once a faculty member successfully completes our Teaching Academy for Distance Learning, they are qualified to develop the course. Each completed course is then assessed against a standard rubric by a third-party vendor.

Several instructional technologies are available for the developer to incorporate in the course to facilitate engagement of students in our online community. The backbone of our online courses is Blackboard Vista 8. Other technologies include, but are not limited to, Blackboard Wimba, Camtasia, Echo360, and Podcasting. These tools are invaluable in enabling student success in online courses.

Our goal for future development is to create a laboratory component so we may make our program 'no-residency.' We are currently investigating new instructional technologies to assist in the development of online laboratories.

Bibliography

- (1) Seven Principles for Good Practice in Undergraduate Education, by Arthur W. Chickering and Zelda F. Gamson,
<http://www.uis.edu/liberalstudies/students/documents/sevenprinciples.pdf>