

Multi-faceted Distance Delivery of C# Instruction in Chinese and English

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2006 Technology-Enhanced Learning (TEL) Grant Program

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Tang Jinyang
Principal Investigator Signature

Jinyang Tang
Principal Investigator Name Printed

Grant Title:


Multi-faceted Distance Delivery of C# Instruction in Chinese and English

If you indicated that you or your co-investigators do have a conflict of interest, please describe the nature of the conflict (attach additional sheets if necessary):


2006 Technology-Enhanced Learning (TEL) Grant Program Signatures

We, the undersigned, certify that we have reviewed the attached

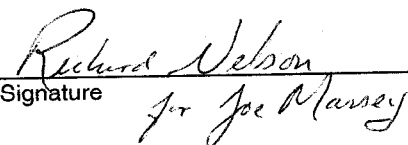
- grant proposal,
- cover sheet, and
- conflict of interest disclosure.


Principal Investigator Signature

Jingpeng Tang
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Department Head Signature

David DeLuitt, Jr.
Department Head Name Printed


Dean Signature

Richard Nelson
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TEL Grant Program 2006 - Jingpeng Tang - University of Minnesota, Crookston **“Multi-facetted Distance Delivery of C# Instruction in Chinese and English”**

Introduction - C# Programming Language

C# (pronounced C-Sharp) programming language was announced by Microsoft in 2000. It has roots in C, C++, and Java, adapting the best features of each and adding new features of its own. C# language was designed specifically for the .NET platform as a language that would enable programmer to migrate easily to .NET. In 2000, Microsoft announced its .NET initiative, a new vision for embracing the Internet and the Web in the development and use of software. Within the .NET platform, software components from different languages can interact as never before. Old software can work with new C# programs. More importantly, C# applications can interact via the Internet, using industry standards such as XML, XML-based Simple Object Access Protocol (SOAP), and Web Services. C# programming language is not only a powerful Object-Oriented computer language, but also a chain that connects modern Software Engineering concepts and practices.

The information technology industry is experiencing a rapid increase in demand for programmers with a competency in C#, but most universities are still teaching C++ and Java as Object-Oriented languages. UMC sees an opportunity to develop an online C# programming course to meet the demands from on-campus students, distance students, and industry.

Target Audience for this Project - China

In December 2006, UMC signed an international cooperation agreement with Zhejiang Economic and Trade Polytechnic (ZETP) in China to deliver an associate degree in Information Technology Management and a bachelor's degree in Computer Software Technology. According to the agreement, UMC, via its Math, Science, and Technology department, will help ZETP to construct the curriculum and deliver six courses to China. ZETP will then select prospective students to attend UMC to finish their BS degree. A model for delivering an online class supported with streaming audio and video, discussions, blogs, wikis, and creative methodologies enabling interactive assessment is needed to assure the quality demanded of this program. The C# class presents an opportunity to prepare the Chinese students by providing instruction in a comprehensive computer language while enhancing their English ability and would provide the campus with a model as we continue developing international education partnerships. The updated strategic plan for the UMC campus calls for increases in enrollment, for significantly diversifying the campus, and broadening our commitment to alternative academic delivery strategies. This project will add substantially to our understanding of the methodologies that will be necessary in delivering into distance markets with unique language and cultural differences.

Course Construction

This C# programming course will be constructed as video streamed, on-line course to meet the demand of on-campus students, industry people, and overseas students. Necessary hardware and software are needed to construct the course.

The course will be divided into two parts,

Part 1 is the introduction of basic C# concept as a traditional Object-Oriented programming language. Topics covered in this part include Classes and Objects, Control Structures, Inheritance, Polymorphism, Overloading, File and Streams, and Data Structures.

Part 2 will introduce more advanced topics of C# with Internet Services. Topics covered in this part include .NET Concept, Graphic and Multimedia, XML, Database and ADO.NET, ASP.NET, and Web Services.

Upon successful completion of this course, the student will:

- Understand and demonstrate use of C#'s primitive datatypes
- Be able to declare, initialize and use variables and arrays,
- Be able to use selection and iteration constructs.
- Be able to create classes, objects and interfaces.
- Demonstrate use of GUI components and event handling.
- Demonstrate understanding of composition, inheritance, and polymorphism.
- Be able to handle exceptions.
- Be able to write clear and concise documentation for program code.
- Demonstrate competency in manipulating Microsoft Visual Studio IDE.
- Demonstrate basic Software Engineering concepts in assignments and group projects.
- Demonstrate an understanding of the .NET platform Simple Object Access Protocol (SOAP), and Web Services.
- Have developed an appreciation for cultural differences and challenges in developing software in the global marketplace

Tools for Delivery

The delivery of any programming language course requires a high level of interactivity. Late in the Spring of 2006, the campus will make take delivery on an instructional technology media delivery system marketed as Sonic Foundry's MediaSite platform of hardware and software which will allow for lectures to be streamed live while being captured for later viewing and for asynchronous delivery. The great strength of the MediaSite technology is that the captured presentation does not require editing once the presentation is completed. It is also extremely professor and student friendly with no software, other than a browser, required on either end. UMC has also acquired the Macromedia Flash extensions for MediaSite that will allow for the conversion of the final presentations from a Windows Media stream to a Flash movie. This will allow for much more efficient media delivery to distance audiences. It should also be noted that MediaSite will allow the instructor not only to use PowerPoint, but will allow for comprehensive demonstrations of software applications. It also has interactivity tools that allow for the engagement of students during the live presentations.

In addition, we will use Macromedia Breeze 5 for interactive sessions with students, and WebCT or Moodle for course management. Our initial intent is to support this class with the tools in WebCT, but the campus is also field testing the Moodle open-source learning content management system. It has superb support for Chinese, along with fully functional wiki and blog tools. The decision on what platform to use will be made during the preparation stages in the delivery of the product of this project. It is also the intent to develop individual podcast learning modules.

A typical lecture would refer to short modules (5-10 minutes each) recorded in MediaSite. The course management system would be used for setting schedules, delivering and receiving assignments, team work through discussions, wiki, and blog requirements and basic assessment.

This project will be developed in collaboration with the Instructional Technology Center (ITC), under the direct support of Steve Hannah. A student will be employed to help with the development of the LCMS materials that will guide instruction.

Timelines and Budget

TEL 2006 C# Project Timelines	
May 2006	Create course online infrastructure
June-July 2006	Create/capture teaching modules
August 2006	Prepare for on-site delivery
September-December 2006	Deliver course live at UMC
September-December 2006	Deliver course off-site to ZETP
January-March 2007	Compare, refine techniques

TEL 2006 C# Project Budget	
PI Summer Salary	\$6000
Student Assistant for the Academic Year	\$3500
Travel Costs for Presentation at UMN	\$500
Matching Support	
ITC Staff Support (In-kind)	\$3,500
Department Contribution	\$1,500
MediaSite Equipment Investment	\$36,500

Summary

We propose to deliver an online C# course using a variety of sophisticated and emerging technologies which include MediaSite, Breeze, Moodle, tying together a variety of University of Minnesota resources, thus improving educational access.

Moreover, in this courses development, we expect this format as having strong potential for the balance of our curriculum, both live, and online within the MST department, but also for then entire online curriculum at UMC (and beyond).

In addition, our aim is to create a sense of community with UMC and ZETP students for the purpose of enhancing instruction and learning by improving the lines of communication and interactivity in an online course.