

Appendix A:

Accepted Proposal: Outcome Based Assessment in  
Elementary and Secondary Teacher Preparation

## **Principal Investigator**

Burns, David, Ph.D. Associate Professor of Mathematics, Supervisor of Secondary Education math majors, Coordinator of Secondary Education Supervisors.

## **Title**

Outcome based assessment in Elementary and Secondary teacher preparation.

## **Institution**

Western Connecticut State University

## **Other Team Members**

### **Assistant Principal Investigator:**

Delcourt, Marcia, Ph.D., Associate Professor, Graduate Coordinator.

### **Team 1 Consultants – Content Specialists**

Kutz, Ronald, Ph.D., Professor and Chair of Mathematics and Computer Science Department.  
Maida, Paula, Ph.D., Assistant Professor of Mathematics, Mathematics Education Specialist.  
Cordy, Thomas, Ph.D., Professor and Chair Education & Educational Psychology Department.  
Daria, Marsha, Ph.D., Associate Professor and Elementary Education Coordinator.  
Burke, Janet, Professor - Teaches in Professional Semester and extensive expertise in instructional technology.

### **Team 2 Consultants – Disciplinary Specialists**

Finney, Regina, Department of Mathematics, Ridgefield High School.  
Santos, Rene, Morris Street School, Danbury.  
Fishman, Ann, Brookfield High School.  
Canada, Theresa, Ed.D., Associate Professor, Foundations, Research & Counselor Education.  
Stambler, Leah, Ph.D., Professor and Coordinator of Student Teaching.

## **Statement of Project Focus**

In this project we will focus primarily on generating math based performance tasks to be completed by elementary education and secondary education majors that will be used for program review of the mathematics component of the education curriculum. We want to pilot rubrics and assessment methods possibly in selected education and mathematics courses. The performance tasks will eventually become gateways in the path to certification. We fully intend that our project will be used as a model for other disciplines at the University and on other campuses.

## **Rationale for Project**

In 2003 the state of Connecticut will adopt NCATE standards in all teacher education programs. In preparation for this event, all departments involved in the preparation of teachers will find it necessary to evaluate and modify existing programs, mapping competencies between the various standards we must follow to the WCSU programs. Our program has several natural gateways that can be used to monitor effectiveness. Such gateways include PRAXIS I, a minimum GPA before entry into the program and several exit criteria including CCI evaluation. In addition PRAXIS II scores though not part of graduation requirements are still an indication of student outcomes. What we lack is a “gate” that gives us a performance evaluation of the students. Such

an evaluation is a necessary part of meeting Standard I of the NCATE 200 standards. The Mathematics Department at Western Connecticut State University is an ideal location to house this pilot. The department has a critical core of faculty who are actively involved with current trends in the preparation of teachers complementing a long tradition of providing a strong education major. Elementary and secondary education majors are all provided a significant level of mathematics content courses.

## **Defined Deliverables**

- *The investigators will work with the university administration to support and encourage cooperation between faculty in the School of Arts and Sciences and the School of Professional Studies.*

Western Connecticut State University has an established Education Review Committee (ERC) to coordinate governance-based issues among the Education and Educational Psychology Department, the Music Department, Health Sciences and the School of Arts and Sciences. This committee has a long history of responding effectively in order to facilitate communication among its members and to determine joint policies and practices. The ERC will play a key role in meeting the requirements of the proposed 2003 regulations as well, redefining process and product in preparation for national accreditation through NCATE. ERC members will serve, along with other university faculty on Consultant Team 1 and Consultant Team 2.

- *The investigators will align CCT, INTASC, NCTM and NCATE standards with Western Connecticut State programs. Part of this alignment will provide the necessary information that team members need to complete the project in a meaningful way.*
- *The investigators will identify performance outcomes based on NCTM standards in elementary and secondary education mathematics. At least one task at each level will be invented to test the students' performance in these areas.*

As stated before NCATE requires that Standard 1 be verified by the use of performance assessment. Identifying these outcomes and generating the appropriate assessment tool is critical to the accreditation of the program.

- *The investigators will develop rubrics to be used in the analysis of the performance tasks.*
- *The investigators will attempt create a template to help translate these assessment methods to other disciplines.*

Our purpose is to aid in the conversion of the education curriculum to a performance based assessment model. This is a large project and will take a great deal of work by different individuals in different disciplinary areas. Much of the initial work will involve determining a format to report the performance areas and choosing evaluation tools that may be generalized across disciplines. Wherever possible, there should be a university standard to make such reports easy to read.

## **Means to Assess Excellence of Deliverable**

- A thorough description of the Education Review Committee (ERC) will be provided. This will include a newly developed process for implementing and evaluating both

policies and practices related to the proposed 2003 state regulations and the NCATE accreditation process.

- The excellence of the performance-based curriculum, assessment tools and rubrics will ultimately be determined by the successful accreditation of the department. More immediately the tolls will provide data that can be used to evaluate program effectiveness.

## Work Plan

March 2002 – May 2002	Research and produce alignment of various standards with Western Connecticut State University programs. Identify performance tasks and design pilot assessment.
May 2002 – June 2002	Pilot assessment tools in Elementary Methods courses.
June 2002 – July 2002	Design rubrics and analyze data from first assessment pilot. Create report on pilot.
July 2002 – Sept. 2002	Design assessment pilot for secondary majors that will be applied in secondary methods course.
Sept. 2002 – Dec. 2002	Implement secondary pilot, design rubrics for analysis. Make final report.

**Connecticut State Department of Education  
 Title II Teacher Quality Enhancement Project  
 Attachment A to Institution Level Project Proposal Form**

**Project Membership with Related Honoraria**

**Title of Project: Outcome Based Assessment in Elementary and Secondary Teacher Preparation**

**Principal Investigator: David Burns, Ph.D., Associate Professor of Mathematics, WCSU**

Level of Participation	Title	Names	Honorarium	N of Members in Each Category
High	Principal Investigator	David Burns	\$6000	1
High	Asst. Principal Investigator	Marcia Delcourt	\$4200	1
High	Team 1 Consultants	Ronald Kutz Paula Maida Thomas Cordy Marsha Daria Janet Burke	\$2400 \$2400 \$2400 \$2400 \$2400	5
Low	Team 2 Consultants	Theresa Canada Regina Finney Rene Santos Ann Fishman Leah Stambler	\$1500 \$1500 \$1500 \$1500 \$1500	5
			<b>TOTAL: \$29,700</b>	

# **Listing of specific NCATE outcomes**

## **K-4 Outcomes**

- 1.5 Programs prepare prospective teachers who can –
  - 1.5.1 Demonstrate knowledge of the development, use, and multiple representation of numbers and number systems;
  - 1.5.2 Demonstrate number sense and knowledge of number systems;
  - 1.5.3 Model the use of the four basic operations in multiple contexts;
  - 1.5.4 Use a variety of mental computation techniques;
  - 1.5.5 Apply estimation strategies to quantities, measurements, and computation to determine the reasonableness of results;
  - 1.5.6 Model, explain, and develop a variety of computational algorithms;
  - 1.5.7 Apply the process of measurement to two- and three-dimensional objects using nonstandard, customary, and metric units;
  - 1.5.8 Use geometric concepts and relationships to describe and model mathematical ideas and real-world constructs;
  - 1.5.9 Collect, organize, represent, analyze, and interpret data;
  - 1.5.10 Apply concepts of probability to real-world situations;
  - 1.5.11 Describe and represent mathematical relationships.
- 2.4 Programs prepare prospective teachers who can identify, teach, and model problem solving in grades K-4.
- 2.5 Programs prepare prospective teachers who use a variety of physical and visual materials for exploration and development of –
  - 2.5.1 Preenumeration concepts;
  - 2.5.2 Numbers (whole numbers, fractions, decimals, percents) and their relationships;
  - 2.5.3 Four basic operations with positive and negative rational numbers;
  - 2.5.4 Geometric concepts and spatial visualization;
  - 2.5.5 Measurement concepts and procedures;
  - 2.5.6 Algebraic concepts;
  - 2.5.7 Logical conjectures and conclusions using words such as all, some, and none;
  - 2.5.8 Concepts of probability and elementary data analysis.
- 2.7. Programs prepare prospective K-4 teachers who know when and how to use student groupings such as collaborative groups, cooperative learning, and peer teaching.
- 2.8. Programs prepare prospective teachers who use instructional strategies based on current research as well as national, state, and local standards relating to mathematics instruction.
- 2.9. Programs prepare prospective teachers who can work on an interdisciplinary team and in an interdisciplinary environment.
- 2.10. Programs introduce and involve prospective teachers in the professional community of mathematics educators.
- 3.1. Programs provide prospective teachers with a sequence of planned opportunities prior to student teaching to observe and participate in K-4 mathematics classrooms with qualified teachers. Experiences include observing, tutoring, miniteaching, and planning mathematics activities and lessons for different levels.

- 3.2. Programs provide prospective teachers with a full-time student teaching experience in K-4 mathematics that is supervised by a qualified teacher and a university or college supervisor with a K-4 mathematics teaching experience.
- 3.3. Programs provide prospective teachers with time to confer with the supervising teacher and to do instructional planning.

### 5-8 Outcomes

- 1.5 Programs prepare prospective teachers who can –
  - 1.5.1 Apply concepts of number, number theory, and number systems;
  - 1.5.2 Apply numerical computation and estimation techniques and extend them to algebraic expressions;
  - 1.5.3 Apply the process of measurement to two- and three-dimensional objects using customary and metric units;
  - 1.5.4 Use geometric concepts and relationships to describe and model mathematical ideas and real-world constructs;
  - 1.5.5 Use both descriptive and inferential statistics to analyze data, make predications, and make decisions;
  - 1.5.6 Interpret probability in real-world situations, construct sample spaces, model and compare experimental probabilities with mathematical expectations, use probability to make predications;
  - 1.5.7 Use algebra to describe patterns, relations, and functions, and to model and solve problems;
  - 1.5.8 Understand the role of axiomatic systems and proofs in different branches of mathematics, such as algebra and geometry;
  - 1.5.9 Understand calculus as modeling dynamic change, including an intuitive understanding of differentiation and integration and apply calculus concepts to real-world settings;
  - 1.5.10 Use mathematical modeling to solve real-world problems;
  - 1.5.11 Understand the major concepts of Euclidean geometry from a variety of perspectives including coordinate and transformational;
  - 1.5.12 Use counting to enumerate and order; use matrices, finite graphs, and trees to model problem situations; describe basic algorithms for accomplishing tasks;
  - 1.5.13 Understand and apply the concepts of proportional reasoning.
- 2.4 Programs prepare prospective teachers who can identify, teach, and model problem solving in grades 5-8.
- 2.5 Programs prepare prospective teachers who use a variety of physical and visual materials for exploration and development of mathematical concepts in grades 5-8.
- 2.7 Programs prepare prospective 5-8 teachers who know when and how to use student groupings such as collaborative groups, cooperative learning, and peer teaching.
- 2.8 Programs prepare prospective teachers who use instructional strategies based on current research as well as national, state, and local standards relating to mathematics instruction.
- 2.9 Programs prepare prospective teachers who can work on an interdisciplinary team and in an interdisciplinary environment.

- 2.10 Programs introduce and involve prospective teachers in the professional community of mathematics educators.
- 3.1 Programs provide prospective teachers with a sequence of planned opportunities prior to student teaching to observe and participate in 5-8 mathematics classrooms with qualified teachers. Experiences include observing, tutoring, miniteaching, and planning mathematics activities and lessons for different mathematics courses.
- 3.2 Programs provide prospective teachers with a full-time student teaching experience in 5-8 mathematics that is supervised by a qualified teacher and a university or college supervisor with a 5-8 mathematics teaching experience.
- 3.3 Programs provide prospective teachers with time to confer with the supervising teacher and to do instructional planning.

### 7 – 12 Outcomes

- 2.7 Programs prepare prospective 7-12 teachers who know when and how to use student groupings such as collaborative groups, cooperative learning, and peer teaching.
- 2.8 Programs prepare prospective teachers who use instructional strategies based on current research as well as national, state, and local standards relating to mathematics instruction.
- 2.9 Programs prepare prospective teachers who can work on an interdisciplinary team and in an interdisciplinary environment.
- 2.10 Programs introduce and involve prospective teachers in the professional community of mathematics educators.
- 3.1 Programs provide prospective teachers with a sequence of planned opportunities prior to student teaching to observe and participate in 7-12 mathematics classrooms with qualified teachers. Experiences include observing, tutoring, miniteaching, and planning mathematics activities and lessons for different mathematics courses.
- 3.2 Programs provide prospective teachers with a full-time student teaching experience in 7-12 mathematics that is supervised by a qualified teacher and a university or college supervisor with a 7-12 mathematics teaching experience.
- 3.3 Programs provide prospective teachers with time to confer with the supervising teacher and to do instructional planning.

January 28, 2002

David Burns, Ph.D.  
WCSU  
181 White Street  
Danbury, CT 06810

Dear David:

I am writing in response to your Title II Teacher Quality Enhancement grant proposal. A committee has reviewed your proposal and is inclined to approve it with revisions. Several questions were raised about the proposal which we need you to address in your revised proposal.

As you know, the request for proposals stipulated that, at minimum, the following deliverables were expected:

- 1) Description of coordination of administrators and faculty of departments and/or schools;
- 2) Development of curriculum model and/or a related performance assessments with rubrics; and

NOTE: *although a dissemination plan was previously required, this deliverable is no longer required because the CSDE will be coordinating the dissemination of workgroup deliverables to all Connecticut teacher preparation institutions.*

The following are the deliverables you listed in your proposal:

- Performance-based assessments/rubrics in elementary/secondary education mathematics methods courses
- Create a “template” (a syllabus and performance assessment) to modify other courses within the math education curriculum and other disciplines

However, it is not clear from the above, what the actual deliverables will be. Please revise your proposal to address the following questions and concerns:

- Are you developing programmatic performance assessments or course-based performance assessments? We recommend that you consider focusing the development efforts on *programmatic* performance assessments.
- Will you focus the assessment development on secondary **and** elementary math education competencies or just one level? Focus the project and faculty resources on an achievable scope of work within the given timelines.
- At which points in the teacher preparation program do you intend the *programmatic* performance assessments to be administered to the teacher preparation candidates? We recommend that you consider assessing competency of teacher candidates at a transition point in the preparation program. Consider the **transition points** (or gates) which the NCATE accreditation will focus upon: admission to the program, prior to student teaching, student teaching and exit from the program.
- How do you intend to involve K-12 educators? You may wish to reconsider the individuals on the team and ensure that you include with K-12 educators as well as faculty who are directly connected with the preparation of secondary or elementary math teacher candidates.

- How do you intend to conduct an external review outside of the workgroup faculty? Consider a team including mathematics/education faculty outside of the workgroup and outside of the WCSU faculty.

In addition, due to the compressed timelines of the project, please be advised that we are extending the work plan deadline to December 31, 2002. Please revise your work plan accordingly and submit it along with your revised proposal by e-mail by February 15, 2002, so that I may review it for approval.

David Burns, Western Connecticut State University  
Title II Grant Proposal Revision  
February 1, 2002  
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If you have any questions, please do not hesitate to contact me at 860-713-6716 or at <<[georgette.nemr@po.state.ct.us](mailto:georgette.nemr@po.state.ct.us)>>. I look forward to hearing from you.

Sincerely,

Georgette Nemr  
Title II Project Director  
Bureau of Certification and Professional Development

cc: Margaret Leahy, Grants Coordinator, WCSU  
Lynne Clarke, Dean of Education, WCSU