Revitalizing K-6 Math and Science Teacher Education

Through the NSF/ATE Teaching Partnership Master Plan Project
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and
Large Scale Teacher Preparation
Tennessee Board of Regents
Teacher Preparation Partnership Project
Jim Kelley, P.I.

“Problems can become opportunities, if you get the right people together.”
Robert Redford
Revitalization begins with assessment.

- In teacher education:
  - What was happening at our school?
  - What was happening on the local scene?
  - What was happening on the national scene?

**Fall Semester 2001 we assessed our teacher education situation:**

- We knew at least 40% of future K-12 teachers take some of their math and science at a community college (NSF, 1998).
- But at PSTCC we had only ~30 students listed as education majors.
- We felt the “appropriate” math and science courses were not being provided at PSTCC.
• We also knew that school teachers tend to teach the way they were taught and emphasize the material to which they were exposed; a scary thought.

Pellissippi State’s Academic VP was thinking that to expand and succeed we needed a partner for teacher education. So he found one.

• Tennessee Technological University (TTU), is located ninety miles west of our main campus.

• They wanted to establish a 2+2, K-6 teacher education program with us, with their last two years on our campus.
Then we learned about this:

• National Phi Theta Kappa had a NSF Project (“Preparing Tomorrow’s Math and Science Teachers: The Community College Response”).
• A PSTCC/TTU Team was selected for project participation.
• What we learned there changed our whole teacher education program.

Summer 2002

• PSTCC and TTU signed an agreement to offer a complete bachelor’s degree program for K-8 teachers on PSTCC campus. (Junior and Senior years taught at PSTCC.)
• Preparation of a full NSF/ATE Teaching Partnership proposal was put in motion.
**Fall Semester 2002**

- To identify education students PSTCC campus was plastered with flyers.
- Over 200 prospective K-8 teachers identified.

**Spring Semester 2003**

- 3 of the 4 Concepts in Science courses for education majors introduced: biology, chemistry, earth science.
- Two K-8 teacher education math courses were taught.
- Intro to the Teaching and Technology course offered.
Summer 2003

- Official notification of NSF/ATE proposal funding.
- Math and Science Teacher Education Resource (MASTER) Hub established.
- The final science concepts course is introduced: physics.

Aspects of the “MASTER” Program

- Pre-service Teacher Training
- Articulation
- Student Support
- Facilities
- Technology
Pre-service Teacher Training

The Curriculum
- Introduction to Teaching and Technology
- Concepts of Biology
- Concepts of Chemistry
- Concepts of Physics
- Concepts of Earth Science
- The Structure of the Number System
- Geometry and Statistics

• The students need an introduction to the teaching profession and early field experience to help them explore teaching early in their academic careers.
Articulation

- On-site 2+2-
  Tennessee Technological University
  20 Juniors began on PSTCC campus in Fall 03
  48 juniors for Fall ’04 and ‘05
- Lincoln Memorial University
- University of Tennessee
- Maryville College

Student Support

- Future Teachers Conference
- Student Tennessee Educators Association (STEA)
- Mentor Teams
- Praxis Preparation Workshop
- Education Profession Day
- Financial Aid Workshop
- Academic Advising
Academic Advising

- Identifying interested faculty advisors, including one at each branch campus
- Training the advisors
- Creating new major codes to identify students

<table>
<thead>
<tr>
<th>Major</th>
<th>Spring 2006 Headcount</th>
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<tbody>
<tr>
<td>Elementary Education</td>
<td>119</td>
</tr>
<tr>
<td>Education-TTU (2+2)</td>
<td>254</td>
</tr>
<tr>
<td>Education – LMU</td>
<td>12</td>
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<tr>
<td>Special Education</td>
<td>31</td>
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<tr>
<td>Secondary Education</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>471</strong></td>
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</tbody>
</table>

The MASTER Hub

- A room or rooms to accommodate all education course activities.
- Laptops, Multimedia Station.
- Math and Science Materials.
- Resource Room.
### Technology

- Laptops with wireless network connections
- Interactivate math activities
- Agent Sheets as a computational science tool
- Multimedia Station
- Smart Board
- Digital Cameras
- Vernier /CBL
- GPS Technology

### And then....

- Established the MASTER Program on our Magnolia Avenue Campus.
- Assessed and analyzed what we had done, and redesigned when necessary.
- Decided to take our plan to the state level.
It seemed like a natural progression…

• In February 2003 a meeting was hosted by Tennessee Board of Regents (TBR) to examine the possibility of a state wide grant for K-6 teacher education.

• Representatives from all nineteen TBR colleges and universities attended. They were all interested in this possibility.

• A comprehensive preliminary grant proposal was prepared and submitted to NSF.

• A full proposal was encouraged, but with a reduction of the budget. The full proposal was submitted.

• The short version: NSF’s budget had been cut too much; the scope of the project had to be reduced.
The “Eastern Corridor” TBR-Teacher Preparation Partnership project was submitted to NSF and was funded; starting date, September 1, 2005.

Seven community colleges and two four-year universities:

Northeast State Technical Community College
Walters State Community College
Roane State Community College
Motlow State Community College
Chattanooga State Technical Community College
Cleveland State Community College
Pellissippi State Technical Community College
East Tennessee State University
Tennessee Technological University

The TBR-TPP project follows a pattern similar to Pellissippi State’s local NSF project.

- Improve math, science and technology preparation of future teachers
- Improve Articulation by offering similar MST courses
- Develop Student Support Systems
- Develop a more diverse teaching pool
- Provide content opportunities to meet NCLB requirements
Meanwhile back at TBR and TTU, Dr. Garber, College of Education Dean, had some wheels turning—the development of the Associate of Science in Teaching Degree.

This was modeled after the Maryland and Illinois plans.

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**Associate of Science in Teaching Degree**

**K-6 Curriculum**

**General Education Component**  41 Hours

- Communication  
  ENGL 1010, 1020, Basic Speech  9
- Humanities  
  One Literature Course from Approved List  3
  Art Appreciation or Music Appreciation  3
  One Additional Humanities Course from approved list  3
- History  
  HIST 2010, 2020, or 2030  6
- Social/Behavioral Science  
  World Regional Geography  3
  American Government (Political Science) or Sociology  3
- Natural/Physical Sciences  
  Biological/Life Science  4
  Physical Science  4
- Mathematics  
  Math Course from Approved List  3

**Remaining Nineteen Hours**

- Introduction to Education  3
- Introduction to Special Education or Development of the Exceptional Child  3

- Developmental Psychology, Educational Psychology, Life Span Development, or Human Growth and Development  3
- MATH 1410 and 1420  6
- Additional Science (Earth Science, Geology, or Astronomy)  4

**Additional Degree Requirements**

- Attaining a 2.75 cumulative grade point average; Successful completion of Praxis I
- Satisfactory rating on an index of suitability for the teaching profession (procedure will be developed through collaboration between university and community college representatives)
• With this background, the TBR-TPP project had its initial meeting; February 24 and 25, 2006.

• It was exciting, in more ways than one!
  Geared to focus on:
  • Getting to know each other: participants were sorted by field.
  • Understanding state math and science standards.
  • Understanding state licensure standards.
  • Beginning a curriculum dialogue.

  • Purposefully promoting controversy.
  – The standards versus courses discussion.

A tremendous success--

Related emails are still arriving.

Everyone is looking forward to our next meeting:
May 9-12, 2006.
All of TBR is now on the same calendar!!!
Planning is much easier.