2-7-2014

A Residency Model: Shifting from Traditional to On-Site Education

Ryan Andrew Nivens
East Tennessee State University, nivens@etsu.edu

A Residency Model: Shifting from Traditional to On-Site Education

A Residency Model: Shifting From Traditional To On-Site Education

By Ryan Andrew Nivens

Paper prepared for the 18th annual meeting of the Association of Mathematics Teacher Educators, Irving, CA

Abstract
I report how methods course assignments shifted from simulation to actual participation in remediation, assessment, and co-teaching in a K-6 methods course in a state where policies dictate a residency model in place of traditional courses followed by student teaching.

This paper provides a description and report of how a K-6 math methods course has shifted from simulation-style problem-based learning projects to projects that involve actual children in the K-6 classroom in a co-teaching environment.

I also report on how the shift to a Residency model is impacting the secondary education track and how the Noyce Scholarship is helping ease the transition.

Background
The Ready2Teach program is Tennessee's effort to implement a medical school residency-style model into the teacher education programs throughout the public higher education institutions of the state. The Ready2Teach program had its earliest envisioning in 2009 and began full implementation in the fall of 2013. East Tennessee State University began piloting the Ready2Teach program in the fall of 2012.

We begin broadly with our interpretation of the Tennessee Board of Regents required residency model of student teaching that would take place over the entire senior year with reduced time on the college campus. Then more specifically, this paper looks at major changes to a K-6 math methods course and how we implemented a new field-based component that accounts for 50 of the required 212 hours of co-teaching during the first semester of the senior year. We discuss how projects in remediation have been adapted to work with real students rather than just samples provided by the instructor. Also, how an assessment design simulation has become a real assessment to be administered in the K-6 classroom, and how a one-lesson teaching experience has the potential to become a semester long co-teaching experience. Finally, we report on the impact the Ready2Teach transition has had on our secondary mathematics education program and how the NSF-funded Noyce scholarship is helping the transition. In particular, we discuss changes to the evaluation of Noyce scholarship applicants and how the residency model is posing new challenges in the matriculation of secondary mathematics education graduates.

Table 1. Comparison of field experience hours in K-6 education program

INITIAL LICENSURE PROGRAM, K-6				
	Field Experiences (Observation and/or Practicum) **-----** **Foundations**	**------** **Methods**	**Clinical Practice (Student Teaching or Internship)**	**Total Number of Hours**
Previous Program ISED K-6 B.S.	Three experiences: EDFN 2300- **20 hrs** Low SES/Minority Intensive/Urban SPED 2300 – **10 hours** Service Learning in a Community – Based Setting EDFN 3301 – **10 hrs** Social Service Agency Total – **40 hours**	Two experiences: READ 3200 field based assignment of **10 hours**. CUAI 4230 field based observations of **60 hours** Total – **70 hours**	CUAI 4580 Two 7.5 week experiences, two in grades K-6; each at a different school and/or grade level TOTAL – **425 hrs**	535
Ready2Teach Program ISED K-6 B.S.	Same as previous. Total – **40 hours**.	5 experiences: CUAI 4310 co-teaching assignments totaling **32.5 hours** SCED 4321 co-teaching assignments totaling **32.5 hours** CUAI 4210 co-teaching assignments totaling **32.5 hours** READ 4026 co-teaching assignments totaling **32.5 hours** CUAI 4241 co-teaching **82 hours** Total – **212** hours	Two Clinical Experiences: CUAI 4560 Pre-Residency 1 – **40 hours** in grades K-6 CUAI 4590 Residency 2 – 12.5 weeks, about **425 hours**, in same setting as Residency 1 and 2.5 weeks in another grade level K-6 Total – **465**	717

Clarification of Terminology and Residency Structure

Specifically, the residency model is being interpreted so that prior to the student teaching semester (now called Residency 2), pre-service teachers (PSTs) will engage in a pre-residency course requiring them to participate in the public school's first week of school, as well as the week prior. In our service area, this can mean that our PSTs begin pre-residency during the last week of July. Residency I, the semester before student teaching, will require that our pre-service teachers and their mentor teachers to engage in 212 hours of co-teaching, with PSTs being full-time in the classroom for 4 of the 15 weeks that semester.

Tables 2 and 3 show the general sequence of residency and expectations of progress through the edTPA and approximate timing of math methods course assignments.

Table 2. Residency I Semester Outline, K-6

Week #	ETSU Campus	Field Placement	edTPA	K-6 Math Methods
1.	M W or T R	8 hrs co-teaching	TASK 1	Simulation for Analysis & Remediation
2.	M W or T R	8 hrs co-teaching	TASK 1	
3.	M W or T R	8 hrs co-teaching	TASK 1	
4.	M W or T R	8 hrs co-teaching	TASK 1	Actual Student Analysis & Remediation
5.	M W or T R	8 hrs co-teaching	TASK 1	
6.	M W or T R	8 hrs co-teaching	TASK 1	
7.	M W or T R	8 hrs co-teaching	TASK 1	
8.	M W or T R	8 hrs co-teaching	TASK 1	Assessment
9.	M W or T R	8 hrs co-teaching		
10.	M W or T R	8 hrs co-teaching		
11.		32.5 hrs co-teaching	TASK 2	Lesson Plan Teaching
12.		32.5 hrs co-teaching	TASK 2	
13.		32.5 hrs co-teaching	TASK 2	
14.		32.5 hrs co-teaching	TASK 2	
15.	M W or T R	Remaining hours		Reflection
16.	Finals Week	Remaining hours		211.5 hrs in field

Table 3. Residency II Semester Outline

Week #	ETSU Campus	Field Placement	edTPA
1.	Weekly seminar	Full time residency	TASK 3 (or redo 2)
2.	Weekly seminar	Full time residency	TASK 3 (or redo 2)
3.	Weekly seminar	Full time residency	TASK 3
4.	Weekly seminar	Full time residency	TASK 3
5.	Weekly seminar	Full time residency	TASK 4
6.	Weekly seminar	Full time residency	TASK 4
7.	Weekly seminar	Full time residency	TASK 4
8.	Weekly seminar	Full time residency	
9.	Weekly seminar	Full time residency	
10.	Weekly seminar	Full time residency	Prepare submission
11.	Weekly seminar	Full time residency	Submit TPA
12.	Weekly seminar	Full time residency	
13.	Weekly seminar	Full time residency	
14.	Weekly seminar	Full time residency	
15.	Weekly seminar	Full time residency	
16.	Finals Week at ETSU		

Residency I: Math Methods for K-6

The course entitled Residency I: Mathematics is a 3-credit K-6 math methods course that requires 2 credits to be completed on campus with 1 credit (approximately 32.5 in-field hours) involved in teaching/co-teaching mathematics. As stated in the syllabus, "This course addresses methodology and theories for teaching and learning elementary mathematics (K-6) with attention paid to problem solving, diversity, current technologies, assessment (including diagnosis and remediation), current issues in mathematics education, reflective teaching and learning, and the application of mathematics to everyday life."

The methodology of teaching that is emphasized in this course is social-constructivism. The current textbook we use is the eighth edition of *Elementary and Middle School Mathematics: Teaching Developmentally* by Van de Walle, Karp, & Bay-Williams (2013). This book places emphasis on activities that emphasize conceptual development, a focus on mathematical models, and multiple strategies for approaching problems. Furthermore, the authors place a focus on students engaging with mathematics in a social manner rather than in isolation.

Theorists that are emphasized in the course include van Hiele, Vygotsky, Piaget, Dienes, Brownell, and Ashlock. In particular, the work of Ashlock (2010) is fundamental to the structure of in class discussions which lead into the major project of analyzing student work and planning remediation discussed below.

Problem solving is taught in the course primarily by immersion in problem solving activities. Activities such as Product Bingo, Roller Derby, Tile Rectangles, and Addition and Subtraction Word Problems are engaged in by the entire class. Discussion center on what grade levels these activities are appropriate for, what Common Core standards are addressed (both content and mathematical practices), and adaptations that may be necessary for English language learners or students with physical disabilities.

Diversity is focused on with selected readings in addition to parts of the van de Walle, Karp, and Bay-Williams textbook. For a discussion on teaching students with special needs, the students read Bray (2005) and Karp and Howell (2004). To learn more about students from diverse backgrounds, the students read Khisty (2002). We also stress the importance of addressing issues in academic language, especially for students from non-English speaking families. This is accomplished by reading Ron (1998) and Rubenstein and Thompson (2002). As the semester extends into a focus on assessment, the PSTs read Wilson (2004). Each of these articles are summarized in an approximately one page document where they are to address the main point of the article, things that surprised them, things they agree with, and things they disagree with.

Current technologies are part of the course and begin with the use of cameras and tripods on the first day of class. While this may seem trivial to some, most people have not had to use a tripod, and during Residency II our PSTs are required to video tape their lesson. This video is recorded in part by using a tripod. However, the primary focus is on creating a photo sheet of everyone in class to emphasize that technology should be used to connect people. Getting to know each other by face and name is a requirement in math methods.

Websites are introduced on the first day of class through the use of the National Library of Virtual Manipulatives (NLVM). In playing the game Product Bingo, we make use of a low-tech spinner on paper as well as the virtual spinner located on NLVM. Later in the semester PSTs visit the NCTM Illuminations website, where they review a number of the applets there that pertain to their field placement grade level. Throughout the semester, the website Wolfram Alpha is utilized. The first use of this typically during the lesson on Tile Rectangles, where students are investigating the nature of primes, composites, squares, and the uniqueness of the number 1. When querying numbers from this activity in Wolfram Alpha, a wealth of information is gathered. In addition to numbers being displayed in multiple representations (symbol, English word, number line location, array of dots, representations in Mayan, Greek, Roman, and Babylonian), the first equation displayed is a number followed by an equal sign and then an expression. For most PSTs, this equation is backwards, in that they have usually seen and expression followed by an equal sign and then a number answer. In this way, technology is used to show PSTs how mathematicians view numbers and equations. During the last week of the semester the PSTs engage in a video creation activity in which they choose a math manipulative or algorithm and create a 5 minute or less video of how to use these in teaching. This is more of an introduction to using a video camera than it is about video editing and script writing. To see an example of these videos, visit http://www.youtube.com/channel/UC-k3IPKexvm23z1FOPnZ8dg.

The main projects of the semester are analysis of student work, planning remediation, designing assessments, lesson planning, and reflective teaching. Table 4 shows what these activities looked like before the transition to the Ready2Teach model and after.

Table 4. Data for methods course changes to teacher education at East Tennessee State University.

Project	Before Ready2Teach (Prior to 2012)	Full Ready2Teach implementation (Current, Fall 2013)
Analysis & Remediation in simulation	Student work samples provided by instructor. PSTs planned a month-long plan for sample student. Content focus: 2nd grade addition.	Student work samples provided by instructor. PSTs planned a month-long plan for sample student. Content focus: 2nd grade addition.
Analysis & Remediation of actual student		Actual K-6 student *identified by PST and mentor teacher*, individual sample collected through a "diagnostic interview" (van de Walle, Karp, & Bay-Williams, 2013). PST designs a month-long remediation (and optionally implements with actual student).
Assessment Design	PSTs designed an assessment on their choice of math strand and grade level.	PSTs, *in collaboration with the mentor teacher*, design and administer an assessment to their field-based students.
Lesson Planning	PSTs planned and taught one math lesson to teach in the field	PSTs actively co-teach throughout the semester. One lesson plan required for course.
Reflection	PSTs reflected on the lesson after teaching it	PSTs reflected on the lesson after teaching it.

Evaluating time in field toward the math methods course

Authentic activities

Coursework that prepares for success on the edTPA

Cross-curricular collaboration

Challenges encountered in Full Implementation

One of the biggest challenges faced was the impact of college coursework on the K-6 classroom workload. The mentor teachers have their own agenda and at times the college coursework requirements seemed to be in the way. Learning how to balance what we want done in the classroom with what the mentor teachers want done is our next goal.

Opportunities for Improvement

What collaboration can be accomplished between science methods, reading/literacy methods, and language arts regarding mathematics education?

The introduction of the session will present this information in brief form, with slides detailing relevant data from each category. However, this data is only to inform the discussion of the impact on the K-6 math methods course and the accompanying co-teaching Residency.

References

Van de Walle, Karp, & Bay-Williams (2013). *Elementary and Middle School Mathematics: Teaching Developmentally* (eighth edition). Boston: Pearson.

Ashlock, Robert. (2010). Error patterns in computation: Using error patterns to help each student learn. Boston: Allyn & Bacon. ISBN 0-13-500910-3.

Natalie N. Duncan, Charles Geer, DeAnn Huinker, Larry Leutzinger, Ed Rathmell, and Charles Thompson (2007). *Navigating through Number and Operations in Grades 3-5*. Reston, VA: National Council of Teachers of Mathematics.

Bray, W. S. (2005). Supporting diverse learners: Teacher collaboration in an inclusive classroom. *Teaching Children Mathematics, (11)*6, 324-329.

Karp, K., & Howell, P. (2004). Building responsibility for learning in students with special needs. *Teaching Children Mathematics, (11)*3, 118-126.

Khisty, L. L. (2002). Mathematics learning and the Latino student: Suggestions from research for classroom practice. *Teaching Children Mathematics, (9)*1, 32-35.

Ron, P. (1998). My family taught me this way. In L. J. Morrow and M. Kenney (eds.), *The teaching and learning of algorithms in school mathematics, 1998 Yearbook of the National Council of Teachers of Mathematics* (NCTM) (pp. 115–19). Reston, Va.: NCTM.

Rubenstein, R. N., & Thompson, D. R. (2002). Understanding and supporting children's mathematical vocabulary development. *Teaching Children Mathematics, (9)*2, 107-112.

Wilson, L. D. (2004). On tests, small changes make a big difference. *Teaching Children Mathematics, (11)*3, 134-137.