2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS

COVER PAGE

Indicate content focus (Science, LIGO, ELA/Literacy, or Mathematics): Mathematics **Grade Level(s) Targeted: 5th and 6th** **Number of Targeted Participants: 30** **Number of Targeted LA GEAR UP Schools: 0**	**School Districts To Be Served:** **Indicate high-need districts with an asterisk *** **Lafayette** **Iberia***

Name(s) of Submitting Institution(s) of Higher Education (Include Branch/Campus/Other Components):
University of Louisiana at Lafayette

Address of Institution of Higher Education (Dept/Unit, Street Address/P.O. Box Number, City, State, Zip Code):
Department of Curriculum and Instruction, PO Box 42051, Lafayette, LA 70504

Title of Proposed Project: *Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra*

Funds being requested for each funding cycle:

July 1, 2012 – September 30, 2012: $77,660	**October 1, 2012 – June 15, 2013 $131,585**

Matching funds from partners:

IHE: **$30880**	**High-need LEA(s):** **$2550**	**Other:** **$22310**

The signatories certify that the institution and the proposed project are in compliance with all applicable Federal and State laws and regulations.

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(Form 2- 2012-13 LaSIP PD, Revised 8/2011)

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS

PROJECT ABSTRACT

Name of Institution (Include Branch/Campus): University of Louisiana at Lafayette

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Title of Project: *Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra*

Abstract

The purpose of this project is to equip middle grades teachers with the requisite mathematics and pedagogical content knowledge needed to fully address the intellectual rigor of the Common Core State Standards for Mathematics, namely the Expressions and Equations standards. In doing so, we aim to position our participants' students for immediate success under the academically demanding structure of the CCSS. Our project will specifically focus on ensuring a grounded knowledge of Algebra, referred to by the National Mathematics Advisory Panel (2008) as the Critical Foundations of Algebra, with hopes of producing demonstrable, statistical gains in: 1) participants' knowledge of Algebra, 2) participants' knowledge for teaching Algebra, and 3) students' knowledge of the pre-requisites of formal Algebra. Partners in our project include the University of Louisiana at Lafayette's College of Education, Department of Mathematics, Lafayette Parish School System and the Iberia Parish School Board, a designated high needs school district. The project is designed for classroom teachers in said parishes teaching mathematics to 5^{th} and 6^{th} grade students. In total, the project will encompass 139 hours of professional activities. Summer 2012 will consist of 54 hours (nine days – six hours each day) while the academic year follow-up days will consist of four Saturdays each lasting 4 hours. Summer 2013 will also consist of 54 hours (nine days – six hours each day). The remaining 15 hours are dedicated to participants "coaching" an *Early HEAT* team that meets during non-school hours and consists of at least ten students. Each *Early HEAT* team will then compete in the *Early HEAT* competition to be held on the University of Louisiana at Lafayette's campus in December 2012. We anticipate the event will attract 300 students taught by our 30 participants (29 teachers and 1 lead teacher) and provide strong evidence of our participants' influence on student mastery of algebraic topics covered. Other distinctive features of our project include: 1) the development of concrete pedagogical strategies (featuring the use of Hands-On Equations); 2) the use of the math circle concept to deepen the problem solving capacity of teachers; and 3) exposure to mathematics and pedagogical content knowledge that parallels what is expected of Elementary Mathematics Specialists and Master Teachers. Finally, components of our project jointly attempt to advance our participants core mathematics knowledge and instructional practices in such a way that it instantly manifests into perceptible boosts in their students' ability to master the critical foundations of algebra.

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PROJECT PROGRESSION TIMELINE OF ACTIVITIES TABLE

Time line	Contact Hours	Action/Activities	Measureable Objective for each activity	Staff Responsible
July 2012	**6hours/ 9days**	Professional development sessions covering Algebra and associated pedagogy. In addition, participants will complete essential evaluation documents.	The activities discussed are most closely aligned to project objectives: #1, #2, #3 #4, #5, #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, problem solving; Collection of Baseline Data
September 2012	**4 hours**	First academic year follow up session; expectations for school year, review and extension of summer training. Scheduling of Fall LOT Observations	The activities discussed are most closely aligned to project objectives: #4, #5, and #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, problem solving;
November 2012	**4 hours**	Discussion of Observation Results; Algebra & Problem Solving Content and Pedagogy;	The activities discussed are most closely aligned to project objectives: #4, #5, & #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, problem solving; Data Collection
December 2012	**4½ hours (non-pay)**	*Early HEAT* Interscholastic Competition held on the UL Lafayette Campus	The activities discussed are most closely aligned to project objectives: #3 and #6.	All Staff Present and Responsible for Activity.
January 2013	**4 hours**	Algebra & Problem Solving Content; Scheduling of Spring LOT Observations	The activities discussed are most closely aligned to project objectives: #3 #4, #5, #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, problem solving;
April 2013	**4 hours**	Algebra & Problem Solving Content; Discussion of Spring LOT Observations; Organizing HEAT teams and Competition	The activities discussed are most closely aligned to project objectives: #3 #4, #5, #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, problem solving;
June 2013	**6hours/10 days**	Professional development sessions covering Algebra and associated pedagogy. In addition, participants will complete essential evaluation documents	The activities are most closely aligned to project objectives: #1, #2, #3 #4, #5, #6.	K. Lopez, content; P. Sheppard, pedagogy & assessment; C. Turner, Calculus Topics for K-8 teachers;

Rationale and Need for the Project

The *Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra* project is unquestionably influenced by the national dialogue regarding mathematical literacy. The National Mathematics Advisory Panel (NMAP, 2008) posits that strengthening America's pipeline of mathematicians, scientists, and engineers is critical to the nation's global competiveness, economic prosperity, domestic safety, and quality of life. Similarly, the National Academy of Sciences (2007) is "deeply concerned that critical scientific and technological building blocks are eroding at a time when many other nations are gathering strength ….. thus we must prepare with great urgency to preserve (our) strategic and economic security" (p. 3- 4). Foremost among the bevy of recommendations for addressing said issues is the improvement of K-12 mathematics and science education. Recent international comparisons of mathematics performance "show that American students have not been succeeding in the mathematical part of their education at anything like a level expected of an international leader" (NMAP, 2008). However, the Common Core State Standards (CCSS) is designed to be the impetus for marked improvements in our nation's mathematical performance. The mission of the CCSS is to provide robust and relevant standards that reflect knowledge and skills necessary to fully prepare students for success in college, careers, and the global economy (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). Likewise, the Louisiana Department of Education (2010) seeks to provide its school-aged population with a "world-class education system" that "prepares students to be effective citizens in a global market." Accordingly, Louisiana is among the conglomerate of states that have adopted the CCSS. As such, the purpose of this project is to better prepare teachers for the intellectual rigor of the CCSS for Mathematics thereby positioning their students for immediate success under the academically demanding structure of the CCSS.

Louisiana's adoption of the CCSS for mathematics requires teachers at the sixth grade level to implement considerably more foundational algebra topics than was previously expected. Specifically, one of four central focus areas for sixth grade instruction in the CCSC is writing, interpreting, and using expressions and equations. Accordingly, the domain *Expression and Equations* is introduced at the sixth grade level along with nine associated standards. Of those nine associated standards, six were not required for sixth grade in Louisiana prior to adopting the CCSS (see Table 1).

Table 1: Common Core State Standards Required for Louisiana Sixth Graders

CCSC Identifier	CCSC Sixth Grade Expression and Equations Standard	Gr. Prev. Taught in LA
6.EE.1	*Write and evaluate numerical expressions involving whole-number exponents*	***Eighth***
6.EE.3	*Apply the properties of operations to generate equivalent expressions*	***Ninth***
6.EE.4	*Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them*	***Ninth***
6.EE.7	*Solve real-world & mathematical problems by writing & solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational number*	***Seventh***
6.EE.8	*Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem*	***Seventh***
6.EE.9	***Use variables to represent two quantities in a real-world problem that change in relationship to one another***	***Eighth***

This is somewhat problematic for a large number of middle school teachers in Louisiana who earned their teacher certification for grades 1-8 (without a mathematics focus area) which was the structure for teacher certification in Louisiana for decades. Compounding the problem is Louisiana students' lackluster performance on national measures of mathematics achievement. The National Assessment for Educational Progress (NAEP) uses representative samples for each state in its analysis and therefore its results are critically important to engendering Louisiana's mission to create a world class education system. The 2011 NAEP report on mathematics showed:

- Louisiana eighth graders' composite score in mathematics was higher than Mississippi and Alabama but 43 other states scores were higher (statistically significant) than Louisiana's score.
- Louisiana had the second lowest average scaled score in the nation and was outperformed (statistically significant) by 44 other states.

Most germane to this proposal is Louisiana's performance on the algebra strand of mathematics. Unfortunately, the results are just as distressing. Every year that NAEP has been administered since 2003, Louisiana has scored significantly lower than the national average scaled score on the algebra strand of the NAEP mathematics exam at both the 4th and 8th grade levels.

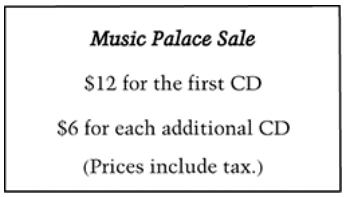
Table 2: Louisiana's Performance on NAEP Mathematics Algebra Strand

Year	Ave Scaled Score Louisiana	Ave Scaled Score National	Difference
2011 4th grade	238	244	**-6 ***
2011 8th grade	276	289	**-13***
2009 4th grade	236	244	**-8 ***
2009 8th grade	276	288	**-12***
2007 4th grade	236	244	**-8 ***
2007 8th grade	276	285	**-9***
2005 4th grade	236	243	**-7 ***
2005 8th grade	271	282	**-11***
2003 4th grade	232	241	**-9 ***
2003 8th grade	268	280	**-12***

Note: * indicates statistically significant differences. SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, NAEP, 2003, 2005, 2007, 2009 and 2011 Math Assessments.

The depth of the problem is perhaps best exemplified through the released test item seen below from the 2011 8th grade NAEP exam. An unfathomable 95% of Louisiana 8th grade students incorrectly answered the following question:

*Music Palace is having a sale. Write an expression that shows how to calculate the cost of buying **n** CD's at the sale*



Our partner school districts, Lafayette Parish School System (LPSS) and Iberia Parish Schools (IPS), are not only concerned about the above issues but are equally concerned about their students' performance on the state-mandated Louisiana Educational Assessment Program (LEAP) test. Our collaborative scrutiny of the data also made us a bit uneasy. When comparing the performance of the 2011 8th graders with their own 2007 4th grade scores, we noticed that the percentage of students scoring at the mastery and advanced levels (the two highest performance levels) in mathematics dramatically decreased in both districts (see table 3). The same trend is also evident for 2010 eighth graders when compared to their 2006 4th grade scores and for 2009 eighth graders when compared to their 2005 4th grade scores. Reasons for the decrease run the gamut, but in our estimation the composition of the 4th and 8th grade tests are key contributors. The 8th grade LEAP test is comprised of three times more algebraic content than that of the 4th grade test. These results ostensibly evince that students in our partner parish are having difficulty making the transition from an arithmetic driven curriculum to one that embeds more algebraic content.

Table 3: Cohort Mathematics Performance on LEAP for IPS and LPSS

School District/Cohort	4th grade Mastery/Advanced	8th grade Mastery/Advanced	% Difference
IPS, 8th grade - 2011	19%	8%	**- 11**
LPSS, 8th grade - 2011	21%	14%	**-7**
IPS, 8th grade - 2010	24%	13%	**-11**
LPSS, 8th grade - 2010	31%	18%	**-13**
IPS, 8th grade - 2009	18%	13%	**-5**
LPSS, 8th grade - 2009	26%	19%	**-7**

In summation, it is clear that improving mathematics teaching and learning is a matter of local, state, and national importance. Our hope is to improve the performance of our local partners, IPS and LPSS, so that they can see demonstrable improvements in the algebraic competency and proficiency of their students thus contributing to the state's overall mission and meeting the goals of our partners. Undoubtedly the most appropriate route to achieve this is by improving teacher knowledge of mathematics and mathematics pedagogy. Prior research has shown that improvement in students' mathematical knowledge is a function of teachers' mathematical knowledge and knowledge for teaching (NMAP, 2008). By delivering a high quality professional development series that shows appreciable gains in teacher knowledge, we hope to further validate the above conjecture. Simultaneously, we would like tenets of our program to be deemed *best practices* so that its replicable components can be used in professional development projects beyond the borders of Louisiana.

Project Design

The current proposal seeks to improve algebraic proficiency in two Louisiana school districts: Iberia Parish Schools (IPS) and the Lafayette Parish School System (LPSS). IPS, a designated high needs school district, has an enrollment of nearly 14,000 students, 72% of whom receive free or reduced lunch and 51% are minorities. Among Lafayette Parish's 30,000 students, 61% qualify for free or reduced lunch and 50% are minorities. According to the 2011 Louisiana Department of Education District Accountability Ratings, both school systems earned "C" letter

grade (Louisiana Department of Education). A more detailed examination of the performance of each school district reveals the following:

- In LPSS, 64% of 5th grade students receiving free or reduced lunch scored at the Basic Level or above in mathematics on the 2011 state mandated I-LEAP test, while 88% of LPSS' 5th grade students who do not receive free or reduced lunch scored basic of above.
- In LPSS, 67% of 6th grade students receiving free or reduced lunch scored at the Basic Level or above in mathematics on the state mandated I-LEAP test, while 89% of LPSS' 6th grade students who do not receive free or reduced lunch scored basic of above.
- In LPSS, 54% of 5th grade minority students scored basic or above in mathematics on the 2011 state mandated I-LEAP test, while 85% of LPSS' non-minority 5th grade students scored basic of above.
- In LPSS, 60% of 6th grade minority students scored basic or above in mathematics on the 2011 state mandated I-LEAP test, while 86% of LPSS' non-minority 6th grade students scored basic of above.
- In IPS, 64% of 5th grade students receiving free or reduced lunch scored at the Basic Level or above in mathematics on the 2011 state mandated I-LEAP test, while 88% of LPSS' 5th grade students who do not receive free or reduced lunch scored basic of above.
- In IPS, 67% of 6th grade students receiving free or reduced lunch scored at the Basic Level or above in mathematics on the state mandated I-LEAP test, while 89% of LPSS' 6th grade students who do not receive free or reduced lunch scored basic of above.
- In IPSS, 52% of 5th grade minority students scored basic or above in mathematics on the 2011 state mandated I-LEAP test, while 77% of LPSS' non-minority 5th grade students scored basic of above.
- In IPSS, 70% of 6th grade minority students scored basic or above in mathematics on the 2011 state mandated I-LEAP test, while 81% of LPSS' non-minority 6th grade students scored basic of above.

In light of the above data, our targeted schools in each district will be schools whose majority populations include students who receive free or reduced lunch and/or minority students. Accordingly, we hope that our project will help curtail the above test score differences. We hope to provide teachers from said schools with "ample opportunities to learn mathematics for teaching, (so that they) will know in detail and from a more advanced perspective the mathematical content they are responsible for teaching and the connections of that content to other important mathematics, both prior to and beyond the level they are assigned to teach" (Kilpatrick, Swafford, & Findell, 2001).

Measurable Objectives

Drawing upon recommendations by the National Mathematics Advisory Panel, the project intends to utilize increases in participants' mathematics and pedagogical content knowledge as chief catalyst for meeting our goals and objectives. The six objectives that guide the project were designed to reflect LaSIP's three major goals. To address LaSIP goal #1 (*increase student achievement),* we intend to measure student achievement in two ways. First, we will compare students' standardized test scores from the year 2012 to their scores on the 2013 tests (pre/post model). Next, we will compare students' pre and post test scores on a project-developed measure of algebraic competency. Thus, our first two objectives are as follows:

1. As a result of this project, students of LaSIP trained teachers will show a statistically significant increase from their prior year's standardized test scores.
2. As a result of this project, students of LaSIP trained teachers will show a statistically significant increase in their knowledge of foundational algebra skills on a project-developed measure of algebraic competency.

To address LaSIP goal #2 (*plan effective professional development*) the authors are proposing a multifaceted approach to the project. The project will focus on increasing pedagogical content knowledge and "pure" mathematics content knowledge. A plethora of research (Ma, 1999; Michigan State University, 2007; Charles A. Dana Center, 2004, Phillip et .al 2007, Ball, 2007) contends that that the best way to improve mathematics skills of students is to ensure that their teachers have adequate content knowledge. Equally as important as subject-matter knowledge is pedagogical content knowledge. Pedagogical content knowledge can be defined as the teacher's extensive knowledge of strategies for communicating information and developing conceptual understanding in alternative ways germane to the subject area taught (Le, Stecher, Hamilton, Ryan, Williams, Robyn, & Alonzo, 2004). Considering the aforementioned, objectives #3 and #4 are listed below:

3. As a result of this project, participants will demonstrate a statistically significant increase in their pre-test and post-test scores on measures of mathematics content knowledge.
4. As a result of this project, participants will demonstrate a statistically significant increase in their pre-test and post-test scores on measures of pedagogical content knowledge.

Further, the project will emphasize: 1) the use of concrete representations to model algebraic concepts and 2) the use of deep problem solving sets to make acquired mathematics knowledge contextually applicable. This kind of pedagogy is closely associated with reform-based teaching. Teachers who possess strong pedagogical content knowledge (which we intend to demonstrate by achieving objective #4) are more likely to engage in reform-oriented teaching. Le et. al (2006) points out "that reform-oriented teaching stresses instruction that engages students as active participants in their own learning as a means of helping them develop complex cognitive skills. This approach pushes students to "do math" emulating the practices of mathematicians and scientists. In mathematics, for instance, teachers might emphasize the use of manipulative aids, problem-solving, and mathematical communication." For those reasons, our subsequent objectives are specifically designed to address the skills necessary for teachers to maximize their instructional potential and simultaneously adhere to LaSIP goal #3 (*Increase leadership capacity and pedagogical skills).* Objectives #5 and #6 are as follows*:*

5. Participants will create and implement at least 15 instructional lessons that model algebraic concepts using concrete representations.
6. Participants will create and implement at least 15 algebraic problem -solving activities that embed critical thinking skills.

Le et al. (2006) also notes that students who had been exposed to more reform-oriented teaching performed better in both math and science than those who had experienced less. Hence, the current proposal seeks to increase participants' pedagogical content knowledge in hopes of increasing the likelihood that they will engage in reform-oriented instruction which in turn will increase students' algebraic knowledge base.

Specific Subject Matter Content/Classroom Instructional Strategies

As the title of our project suggest, the bulk of our pedagogical instruction will be deeply concentrated in Hands–On Exposure to Algebraic Topics (HEAT). We expect these experiences will help participants gain a greater appreciation of the relationship between effective tactile learning experiences and conceptual understanding. We hope that teachers realize that using concrete and pictorial mathematical models to represent and understand quantitative relationships is equally as important as rapidity with algorithms is with respect to algebraic competency.

In particular, we will use the *Hands-On Equations* system developed by Borenson as a primary pedagogical tool for teachers to employ. The *Hands-On Equations* model is based on the fundamental meaning of the equal sign and embeds fundamental mathematical ideas such as transitivity, symmetry, and decomposition. Rather than catering strictly to students who possess logical-mathematical intelligence, this approach appeals to tactile learners and thus we believe will help students make stronger connections between algorithms associated with algebra and the conceptual underpinnings of those algorithms. We find this particularly important for 5^{th} and 6^{th} graders who will be transitioning from arithmetic thinking to algebraic thinking.

To ensure that participants will employ the tactile strategies presented in our summer session, participants' students will be required to compete in the HEAT competition. The HEAT competition was originally developed by the project director as a sub-grant with through an LPSS GEAR-UP grant in 2010. The primary feature of the HEAT competition is that it requires the use of manipulatives and pictorial aids to solve problems (the project director refers to this as an NCAA competition – *No Computational Algorithms Allowed*) so that students can focus on the power of tactile learning and meaning of algebraic concepts. The GEAR-UP version of HEAT was relatively successfully in that it attracted over 150 students from six LPSS GEAR-UP schools for each of the three HEAT competitions (Spring 2010, Fall 2010, Spring 2011). The limitation of the original GEAR-UP HEAT competition was that it was limited to six LPSS GEAR-UP schools.

Through LaSIP funding during the 2011-12 academic year we were able to host the fourth edition of the HEAT competition, which included students whose teachers participated in the *"A TEAM Approach to Algebraic Competency"* project. The project serviced thirty four 6^{th} - 8^{th} grade teachers and resulted in 340 student participants during the December 2011 competition. The event was endorsed by Henry Borenson the inventor of *Hands-on Equations*, who flew in from Pennsylvania to make a guest appearance at the competition. Most important were the results of the competition. First, student participants demonstrated statistically significant gains from a pre-test measure of algebraic topics to a corresponding post-test (which was masked through competition problems). Secondly, even though the top scoring team earned a "D" rating by the Louisiana Department of Education, ten of its students formed the top scoring team in the competition beating out several higher rated schools including an "A" rated school. Finally, the only student to earn a perfect score is enrolled in a different school that earned a "D" rating, meaning she defeated hundreds of students from higer performing schools. What is most notable about the latter two statements is that the HEAT competition once again proved that despite the undesirable rating of schools, there are still students who manage to excel in those environments.

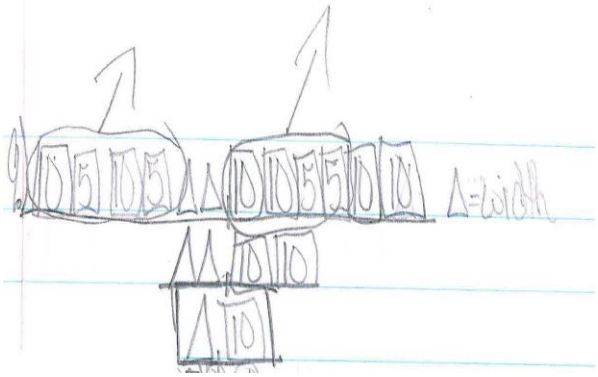
For this current proposal, we envisage an *Early HEAT* competition to include 5^{th} and 6^{th} grade students. With a strong emphasis on the *Expressions and Equations* standards of the CCSS

it seems ideal to include both 5th and 6th grade students. For 6th grade students the content will mirror what they are expected to know. For 5th grade students, it will in effect give them a jumpstart on what they are expected to know in 6th grade (hence the title *Early HEAT*). We trust that our student participants will no longer struggle with problems of this sort (taken from the 2011 NAEP 8th grade mathematics exam):

- A rectangle has a width of *m* inches and a length of *k* inches. If the perimeter of the rectangle is 1,523 inches, which of the following equations is true?
  a) 2(m+k) = 1,523 inches
  b) 2m+k = 1,523 inches
  c) m+k = 1,523 inches
  d) mk = 1,523 inches
  e) m^2k^2 = 1,523 inches

Only 31 percent of Louisiana 8th grade students correctly marked "a" on the above question. Ironically, a similar question was posed to participants in the HEAT competition: *The length of a rectangular map is 15 inches and the perimeter is 50 inches. What is the width of the map?* Figure 1 shows how a 7th grade student from a LPSS Gear-Up school responded to the question, which required a pictorial representation to solve.

Figure 1. Sample Pictorial Response from the HEAT Competition Spring 2011



Explanation. The student decomposes 15 into 10 and 5 and shows this twice to model the length of the rectangle. The two triangles represent the width. He also decomposed 50 into four tens and two fives. This allows the student to remove two tens and two fives from both sides of the balance. This results in two triangles being balanced by two tens. Therefore, one triangle is equal to ten. So the width of the rectangle is 10 inches.

Furthermore, *Hands-On Equations* and the *Early HEAT* competition may be particularly beneficial for our partner school districts in curbing score differentials among the sub-groups mentioned earlier in this proposal. Moreover, we suspect that vertical collaboration will be a reasonable outcome of engaging both 5th and 6th grade teachers who hail from feeder schools that are typically not on the same campus.

The principal investigators of this project also feel strongly that teachers should be engaged in problem solving that deepens their knowledge of concepts they introduce. We believe if teachers are engaged in problem solving they will be more likely to value it in their own classrooms. Thus, we will implement tenets of the Math Teachers' Circle program (see www.mathteacherscircle.org) to engage teachers in deep open-ended problem solving. Open-ended problem solving involves the teachers working through rigorous and challenging problem solving sessions with trained mathematicians. Teachers will be immersed into problems which may take several hours (possibly days) to solve. Through this immersion they will first get to

experience firsthand the frustration some of their students encounter. Secondly, they will learn methods of problem solving that they can implement to not only enhance their content knowledge, but also the knowledge of their students. By building a community of mathematics problem solvers, we suspect, with a high degree of certainty, their enthusiasm will be translated to their students and fellow teachers. This will lead to cohorts of students who can logically analyze and critically think to solve problems.

In each of the two-hour open-ended problem solving sessions a problem or set of problems will be introduced. Participants will be allowed to work on the problems as they wish (either independent or collaboratively) for the remainder of the time. Participants will then be encouraged to work on the problems outside of our meetings. During our next meeting, we will discuss solutions to the problems and the teachers will present their various solutions to the class. Additionally, participants will be expected to consider ways to make given problems appropriate for their own classrooms. Participants will be required to document their students' success and struggles when implementing problem-solving techniques in their own classrooms.

Additionally, the "pure" mathematics content covered during this project will be based on the Texas Standards for Teacher Certification in Middle School Math. We chose to align our course work with that of Texas because no such framework exists in Louisiana. We will focus on Algebra and include the use of: 1) algebraic concepts and reasoning to investigate patterns, make generalizations, formulate mathematical models, make predictions, and validate results; 2) properties, graphs, and applications of relations and functions to analyze, model, and solve problems; 3) variables, expressions, equations, inequalities, and systems in order to analyze, model, and solve problems; 4) connections among geometric, graphic, numeric, and symbolic representations of functions and relations; 5) linear and nonlinear functions and relations, including polynomial, rational, radical, exponential, and piecewise functions, to model problems.

In summation, our overarching goal of the project is to increase algebraic proficiency. As a result, it is appropriate for us to address pre-cursors to algebraic proficiency and associated applications. We will be guided by applicable strands of the CCSS, NCTM content and process standards, and established content standards for teachers of middle school mathematics. Specifically, the CCSS that we plan to address can be found under the sub-heading Expressions and Equations and include: applying and extending previous understandings of arithmetic to algebraic expressions; reasoning about and solving one variable equations and inequalities; representing and analyzing quantitative relationships between dependent and independent variables; using properties of operations to generate equivalent expressions; solving real-life and mathematical problems using numeric and algebraic expressions and equations; and analyzing and solving linear equations and pairs of simultaneous linear equations. Although we have not specifically referenced Louisiana Department of Education documents (i.e. Comprehensive Curriculum) it would be implausible to imply that the above are not in line with Louisiana's future expectations in mathematics.

Delivery Method

In collaboration with stakeholders, we have developed an assortment of activities designed to improve the pedagogical and content skills of teachers while concurrently achieving the aforementioned objectives. To surmise, the project will consist of 124 hours of content, pedagogy, and pedagogical content knowledge enrichment spanning two summer sessions and

four academic year meetings (9 days, 6 hours per day in Summer 2012; 9 days, 6 hours per day in Summer 2013; and 4 days, 4 hour per day during the academic year).

Table 4: Summary of Delivery Method and Content Focus Areas

Dates, Time Commitment	Pedagogical Content Focus	Math Content Focus I	Mathematics Content Focus II
Summer 2012, (9 days 6 hours per day)	Expressions and Equations Common Core State Standards (2 hours per day)	algebraic concepts and reasoning to investigate patterns, make generalizations, formulate mathematical models, etc. (2 hours per day)	Algebra Problem Solving via the Math Circle Concept (2 hours per day)
Fall 2012 (2 Saturdays, 4 hours per day)	Expressions and Equations Common Core State Standards (80 minutes per session)	properties, graphs, and applications of relations and functions to analyze, model, and solve problems (80 minutes per session)	Algebra Problem Solving via the Math Circle Concept (80 minutes per session)
Spring 2013	Expressions and Equations Common Core State Standards; (80 minutes per session)	connections among geometric, graphic, numeric, and symbolic representations of functions and relations; (80 minutes per session)	Algebra Problem Solving via the Math Circle Concept (80 minutes per session)
Summer 2013	Critical Foundations of Algebra: whole numbers, fractions, and geometry and measurement; Selected EMS Standards (2 hours per day)	linear and nonlinear functions and relations, including polynomial, rational, radical, exponential, and piecewise functions, to model problems (2 hours per day)	Calculus Topics for Elementary Teachers (2 hours per day)

The project will also include an additional 15 hours of professional implementation of the strategies discussed in the summer project. Teachers will be required to recruit and train at least ten students from their respective schools to compete in an interscholastic mathematics competition (*Early HEAT*) that allows them to use the hands-on equations models to solve algebraic problems. Teachers will be compensated for completing 15 hours of non-school hour practices with their "HEAT" team. The goals of the sessions are 1) to increase the likelihood of teachers implementing the hands on equations strategy during the after school sessions and during the regular classroom instruction and 2) to inspire students to excel in mathematics and see it as recreational not just academic. The latter statement is inspired in part by the NMAP which contends that "mathematics performance and learning of groups that have traditionally been underrepresented in mathematics fields can be improved by interventions that address social, affective, and motivational factors. Recent research documents social and intellectual support from peers and teachers is associated with higher mathematics performance for all students (p. xix)."Among the products teachers will be required to collect as part of the after-school segment are portfolios for each student during *Early HEAT* practice sessions and a record of common errors students make in a format we refer to as *First-Aid*. The *First Aid* approach uses a physician's analogy to help teachers to identify symptoms (Common Errors), diagnose problems (specify the misunderstood concept), develop prescriptions (instructional

interventions), and identify side effects (long term implications from instructional interventions). In all, we seek to have 300 middle school students competing in the *Early HEAT* competition. All participants will receive an award for competing but the top 150 students will receive medals according to their rank (the top 50 students will earn gold medals, students ranked 51-100 will receive silver medals, and students ranked 100-150 will receive bronze medals).

In Summer II of the project, we hope to offer teachers a more advanced curriculum that focuses on deepening their knowledge of pedagogy and content. Specifically, we hope to groom a cadre of Elementary Mathematics Specialist (EMS) who know their content far beyond the typical elementary teacher. Louisiana recently developed the EMS Certification in 2011, and thus we would like to foster the kind of mathematical leadership envisioned by the program. Although our work in Summer II will not lead to the EMS certification, we will parallel the rigor and core principles of an EMS program as suggested by the Association for Mathematics Teacher Education (2010). In particular, we will expect teachers to:

- *Construct and evaluate multiple representations of mathematical ideas or processes, establish correspondences between representations, and understand the purpose and value of doing so;*
- *Model effective problem solving and mathematical practices—questioning, representing, communicating, conjecturing, making connections, reasoning and proving, self-monitoring and cultivate the development of such practices in learners;*
- *Create social learning contexts that engage learners in discussions and mathematical explorations among peers to motivate and extend learning opportunities.*

In addition, we would like our participants to see the connections between the mathematics they are teaching and its future implications. Using the model created by the Vermont Mathematics Initiative and the Nebraska Math Initiative, our participants will engage in a condensed and modified version of the Calculus for K-8 Teachers course. The topics we discuss will be designed "to introduce teachers to the branch of mathematics known as calculus in a way that relates calculus to the mathematics taught in the K-8 classroom (Vermont Mathematics Initiative, 1999)." We will not offer the course as graduate credit in an effort to make it less intimidating for our participants. In short, our aim in Summer II is to provide the pre-cursors for our participants to take on leaderships roles as mathematics specialists on their campus without necessarily earning the credential.

Collaborative Partnerships and Participant Recruitment

The collaborative nature of the proposed project builds upon prior relationship developed between project faculty, LPSS, and IPS. Collegial and synergistic relationships among the abovementioned have resulted in the successful implementation of four prior LaSIP funded projects since 2008 and one National Science Foundation funded project. More broadly, both school districts serve as primary sites for teacher education students to complete their field experiences and also host professional development schools. In summary, the strength of the relationships among the stakeholders is immeasurable and timeless.

A more tangible measure of their commitment can be found in their letters of support (see attached). Each school district will provide a lead teacher/math coach to conduct the required lot observations of the 15 participants from their respective school districts. To ensure effective program implementation, one lead teacher from LPSS will serve as an implementation liaison and will make site visits to each school's "HEAT" team practice sessions. Furthermore, the

project's student worker will assist in monitoring sites for compliance with project guidelines. Project faculty will document all forms of communication including site visits, phone calls, and emails as other means of assuring effective implementation.

In seeking to recruit participants we will employ a tiered system of recruitment, so that priority will be given to 5^{th} – 6^{th} grade teachers who are employed with schools populated with high percentages of minority students, high percentages of students on free or reduced lunch or schools that are considered low performing by the Louisiana's Accountability System. No less than 2/3 of our participants will fall in this category. According to our partners the schools listed in Table 5 should be our targeted schools. In IPS elementary schools house grades 5 and 6. In LPSS most middle schools house grades 5 and 6 but for those that do not house grades 5 we will seek participants from the listed middle school's feeder elementary schools.

Table 5: Demographics and School Performance of Targeted Schools

School	% of Students Receiving Free/Reduced Lunch	% of Minority Students	School Rating
Acadian Middle School	85%	89%	D-
Carencro Middle School	86%	70%	D-
Judice Middle School	66%	40%	D
Lafayette Middle School	86%	82%	D
Scott Middle School	79%	51%	D-
Jeanerette Elementary School	97%	85	D
Hopkins Elementary	95%	92	D+
North Street Elementary	89%	63	D
Pesson Elementary School	97%	91	D
St. Charles Street	98%	92	D-

We would like to include two teachers in grades 5 and 6 from the abovementioned schools. The remaining slots will be open to any schools within the partner districts including high performing schools. We believe if teachers from high performing schools have expertise in the areas discussed in the project they will be able to share that knowledge with participants from lower performing schools. Furthermore, having higher performing schools participate in the project increases the strength of the competition so that students can recognize that they are the best among the best as opposed to some considering this less rigorous due to the limited population. Nevertheless, among our 30 teacher participants no more than 9 will come from the pool of higher performing schools.

For this proposal we will also select one lead teacher from LPSS to participate in the project. This lead teacher will assist with ensuring that each of the LPSS participating teachers is effectively implementing the project during after-school *Early HEAT* practice sessions. Furthermore, she will conduct the Fall and Spring LOT observations for LPSS, which is used as a cost share from LPSS. Similarly, IPS will assign a math coach to conduct the Fall and Spring LOT observations from Iberia Parish Schools.

Finally, does not formally include LA GEAR-UP schools in IPS but it does include feeder schools from those IPS GEAR-UP schools as priority schools (For example, Jeanerette Elementary students eventually attend Jeanerette High School). In addition, the Lafayette Parish

School System has its own GEAR-UP grant for which includes 5 middle schools in the district. Each of those schools is included in Table 5.

Quality of Key Personnel

To ensure that teachers completing this project obtain the requisite knowledge to advance mathematics teaching at their school site, we will rely on the expertise of our staff. Dr. Peter Sheppard, project director, is a former middle school mathematics teacher. Dr. Sheppard has eleven peer reviewed papers published and has presented at over thirty state, regional, and national conferences. He is currently project director of three externally funded projects including the *High School HEAT Project, A TEAM Approach to Algebraic Competency, and the University of Louisiana Value Added Action Research Project*. He has also led the *Utilizing Student Responses to Improve Mathematics Teacher Knowledge Project, Improving the PACS of Middle Grades Teacher Project* (LaSIP funded) and the *Cajun Comrades Project*, a service-learning project used to foster and mold the pedagogical development of prospective elementary teachers. In addition, he teaches mathematics methods courses and serves as an advisor for prospective elementary, middle, and high school teachers. Prior to being employed with the University of Louisiana at Lafayette, Dr. Sheppard spent three years as program manager with the Gordon A. Cain Center at LSU where he was responsible for the recruitment and development of over 100 mathematics and science majors pursing teacher certification and responsible for the recruitment, training, and monitoring of thirty-two accomplished teachers who served as mentors to the aforementioned students. Dr. Sheppard was also named the 2009 Louisiana Association of Teachers of Mathematics Outstanding College Professor, a 2008-09 *Emerging Leader* by the Phi Delta Kappa International, and earned and an Early Career Travel Award from American Educational Research Association, Division of Teacher Education. Dr. Sheppard will be responsible for oversight of the project as well as instruction in pedagogical content knowledge.

Dr. Kathleen Lopez is an associate professor with a doctorate in Mathematics who has been teaching pre-service mathematics courses for twenty-three years. She has been the project director for four grants and has participated in several projects which included the design of mathematics courses and preparation of materials for these courses. She is co-author of the text for Proportional Reasoning and Problem-Solving for Teachers which is a mathematics capstone course for students seeking middle school certification with mathematics as an In-Depth Teaching Area. She has made numerous presentations about the mathematical preparation of teachers at local, state, regional, and national meetings.

In addition she was a member of state-wide Mathematics Assessment Task Force to assist in the development of field-based assessment instruments for use with teacher candidates while they are practice teaching; and she was the community college faculty representative for the K-16+ Mathematics Consortium on mathematical content standards for teacher certification (1999 - 2000). As a member of the Teacher Advisory Panel for the National Council of Teachers of Mathematics journal, *Mathematics Teacher*, she reviewed two issues in Fall 2003. In 2001, she won the LA-MS Section MAA Award for Distinguished College or University Teaching of Mathematics. She will be primarily responsible for the expanding the mathematical content knowledge of the participants.

Dr. Christina Eubanks-Turner is currently an Assistant Professor of Mathematics at the University of Louisiana at Lafayette (UL Lafayette). As a 2008 Ph.D. graduate from the

University of Nebraska-Lincoln's (UNL) math department, Dr. Eubanks-Turner has had the opportunity to attend and give presentations at the Lincoln Area Teachers' Circle. Being in contact with some of the organizers of the Lincoln Area Teachers' Circle and having an ongoing relationship with this circle inspired her to start the Acadiana Math Teachers' Circle. She is one of four organizers of the Acadiana Math Teachers' Circle, which is a nationally recognized group of middle school teachers and mathematicians who meet monthly to solve open-ended math problems. As a graduate student at UNL, Dr. Eubanks-Turner participated in many programs that were geared toward math and science education. While participating in one such NSF-funded program, Project-Fulcrum, she was allowed the unique privilege to team-up with math and science middle school teachers of the Lincoln Public Schools to find interesting activities to enhance the curriculum being taught. The Project also strived to change the stereotypical images students have of mathematicians and scientist. The Math in the Middle Institute was a NSF-funded partnership among educators at UNL, Lincoln Public Schools and Nebraska's Rural Educational Service Units. Dr. Eubanks-Turner worked with Math in the Middle as a workshop facilitator for two of the Master's level courses for in-service teachers. She also served as an instructor with the NU-Teach Institute. This is an intense one-week professional development course for high school math teachers. Dr. Eubanks-Turner served as a Visiting Scholar for ETS (Educational Testing Services), where she worked on educational measurement, policy issues related to assessment equity and attended seminars on fairness in testing. In particular, she worked with some of the math portions of the PRAXIS II, NAEP and SAT tests. In her current position at UL Lafayette, she has taught courses for undergraduate math education majors and also serves as a member of the math education committee in the UL Lafayette math department.

Evaluation

To assess the merit of our program, we will utilize both formative and summative evaluative measures. The formative evaluation will include intermittent surveys (after Summer I and after the second academic year follow-up tentatively scheduled for November 2012) to ensure that our project is on route to meeting its intended objectives and the needs of our participants. To allow for quick analysis of the surveys we will use an online source such as *Survey Monkey* to administer surveys. Results from those surveys will assist project staff in making instructional and program adjustments if necessary. An additional formative evaluation method will include periodic journal reflections that will allow participants the opportunity to anonymously express perspectives on the project. Each participant will submit no less than 10 journal prompted journal entries and will be free to submit unsolicited entries at their leisure. A less formal form of formative assessment that has proven to be successful for us is the use of instructional feedback in the form of "sticky notes." Each day the project directors provide participants with a stack of stick notes which they use to inform us of the effectiveness of the day's lesson. Participants post their nameless "sticky notes" under three main headings: 1) "Clear as Mud" – a specific topic was not comprehended very well; 2) "Ah-ha" – the day's instruction enlightened and enriched understandings of the topic; and 3) "Déjà Vu" – the topic of the day was introduced before without any new knowledge gained or lost.

Our summative evaluation will seek to broadly assess 1) the quality of our implementation - *Was the program implemented properly and according to the program plan?* and 2) the extent of our impact – *Did we have a positive impact on our teachers participants and*

their students (Johnson & Christensen, 2008)? Simultaneously, our summative evaluation seeks to systemically assess the outcomes of the program as compared the set of explicit established standards (Tashakkori & Teddlie, 2003). Our standards are presented in the form of the objectives seen below. Each objective is followed by a brief description of the measure used to meet the objective.

- *Objective #1 – As a result of this project, students of LaSIP trained teachers will show a statistically significant increase from their prior year's standardized test scores*.
    - **Measure**: We will access student scores from the spring 2012 I-LEAP tests ("pre-treatment score") and use these scores as baseline scores. Then we will compare the Spring 2013 scores ("post treatment scores") with the Spring 2012 scores. We will determine statistical significance based on paired t-test with a p-value of .05.
    - **Data Collection Method:** Each participant will submit 2012 and 2013 standardized test score from their students and project directors will analyzed data.
- *Objective #2 – As a result of this project, students of LaSIP trained teachers will show a statistically significant increase in their knowledge of foundational algebra using a pre-post-test measure of algebraic proficiency*.
    - **Measure:** Upon completion of 15 hours of instruction directly related to content discussed during our project, student mastery of said content will be determined using questions from the *Early HEAT* competition. A pre-test measure will be aligned to the questions given during the *Early HEAT* competition. Questions also will be aligned with the 6th grade *Expressions and Equations* CCSS. Results will be analyzed using a using a paired t-test with a p-value of .05 and using a form of content analysis which will examine in details students' pictorial solutions to algebraic problems.
    - **Data Collection Method:** Project directors will create test and teachers will administer pre-test during after school session then submit results to project directors. Post-test will be embedded in *Early HEAT* competition questions.
- *Objective #3 – As a result of this project, participants will demonstrate a statistically significant increase in their pre-test and post-test scores on measures of mathematics content knowledge*.
    - **Measure:** Participant performance on a measure of mathematics content related to Algebra will be used to determine whether this objective was met. Authors will use modify released items from the Massachusetts Tests for Educator Licensure as primary tool for assessing teacher content knowledge. This instrument is justifiable due to the fact that 1) Massachusetts has established mathematics content standards similar to those that will guide the project's instruction and 2) Massachusetts is consistently among the highest scoring states on measures of student achievement such NAEP. The results will be analyzed using a paired t-test with a p-value of .05.
    - **Data Collection Method:** Participants will submit pre-test scores upon completing first day of summer sessions and post test scores upon completing last day of summer sessions.

- *Objective #4 – As a result of this project, participants will demonstrate a statistically significant increase in their pre- test and post-test scores on measures of pedagogical content knowledge*.
    - **Measure**: Participant performance on a measure of pedagogical content knowledge will be used to determine whether the objective was met. The project faculty has proposed using questions used by Phillip (2004) for the Integrated Mathematics and Pedagogy Project and vignette items used by Stecher et al (2006) used in a study on reform oriented instruction done for the RAND corporation. The results will be analyzed using a paired t-test with a p-value of .05.
    - **Data Collection Method**: Participants will submit pre-test scores upon completing first day of summer sessions and post test scores upon completing last day of summer sessions.
- Objective #5 *Participants will create and implement at least 15 instructional lessons that model algebraic concepts using concrete representations*.
    - **Measure:** We will evaluate the above objective through direct observation, analysis of student portfolios, and teacher journal reflections from the after school component of the project.
    - **Data Collection:** Participants will submit the above in December 2012. Project directors will analyze thereafter.
- *Objective #6: Participants will create and implement at least 15 algebraic problem solving activities that embed critical thinking skills*.
    - **Measure:** We will evaluate the above objective through analysis of teacher unit and lesson plans. Teachers submit the above and associated artifacts as evidence of their use algebraic problem solving activities.
    - **Data Collection:** Participants will submit the above during Spring 2013. Project directors will analyze submissions thereafter.

Collectively, we view this evaluation plan as comprehensive and applicable to the project components. It seeks to provide objective evidence that the project parallels its own goals and those of the LaSIP initiative.

LOUISIANA SYSTEMIC INITIATIVES PROGRAM

PROPOSED PROJECT BUDGET REQUEST - FORM BR

PROJECT NAME: Early H.E.A.T. as a Catalyst for Mastering Critical Foundations of Algebra in the Middle Grades

PROJECT CONTENT AND STRAND FOCUS: Mathematics: Algebra

PROJECT DIRECTOR, UNIVERSITY: Peter Sheppard, University of Louisiana at Lafayette

A	B	C	D	E	F
Reference	**Budget Item**	**Brief Description of Budget Item**	**Funds Requested 7/1/11-9/30/11 Max of $80k for this period.**	**Funds Requested 10/1/11-6/15/12**	**Total Funds Requested**
A. University Employed Staff					
1	Peter Sheppard, Director/Faculty Member	Instructional Staff & Project Director	4,044.00	8,089.00	12,133.00
2	Kathleen Lopez, Co-Director/Faculty Member	Instructional Staff & Project Director	3,573.00	7,145.00	10,718.00
3	Christina Eubanks-Turner, Faculty Member	Instructional Staff	3,222.00	6,444.00	9,666.00
4	Faculty Member		0.00	0.00	0.00
5	Graduate Student		0.00	0.00	0.00
6	Secretary/Student Worker		1,500.00	1,500.00	3,000.00
7	Other (Specify)		0.00	0.00	0.00
8	Other (Specify)		0.00	0.00	0.00
9		**Total Salaries and Wages**	**$ 12,339.00**	**$ 23,178.00**	35,517.00
10	Fringe Benefits: Rate____35._44___		3,841.00	7,683.00	11,524.00
11		**Total Salaries, Wages, and Fringe**	**$ 16,180.00**	**$ 30,861.00**	**$ 47,041.00**
B. Staff Not University Employed					
12	Consultants		0.00	0.00	0.00
13	Consultant		0.00	0.00	0.00
14	Consultant		0.00	0.00	0.00
15		**Total Staff Not University Employed**	**0.00**	**0.00**	**0.00**
16		**Total Staff Costs**	**$ 16,180.00**	**$ 30,861.00**	**$ 47,041.00**
C. Participant Support					
17	Stipends	54 hours Summer I, 85 hours there	40,500.00	63,750.00	104,250.00
18	Employer Contributions on Stipends: Enter rate (TRSL 25.15%)		10,186.00	16,033.00	26,219.00
19	Substitute Pay		0.00	0.00	0.00
20	School Resource Materials		9,000.00	6,000.00	15,000.00
21	Project Supplies		500.00	5,500.00	6,000.00

22	Other		0.00	0.00	0.00
23	Other				
24		**Total Participant Support**	**$ 60,186.00**	**$ 91,283.00**	$ 151,469.00

D. Travel					
25	Staff Travel		0.00	900.00	900.00
26	Participant Travel		0.00	6,000.00	6,000.00
27		**Total Travel Costs**	**0.00**	**6,900.00**	**6,900.00**
E. Indirect Costs					
28		**Direct Costs Minus Participant Support**	**$ 16,180.00**	**$ 31,761.00**	**$ 47,941.00**
29	Indirect Costs	Line 27 x 8%	1,294.40	2,540.88	3,835.28
30		**TOTAL FUNDS REQUESTED**	**$ 77,660.40**	**$ 131,584.88**	**$ 209,245.28**
F. Core Costs					
31	Core Costs	$ 198,510.00			
32	Number of Participants	30			
33	**Core Cost per Participant**	**$ 6,617.00**			

PROPOSED COST SHARE - FORM CS				
LaSIP PROFESSIONAL DEVELOPMENT RFP 2012-2013				
PROJECT NAME: Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra				
PROJECT DIRECTOR, UNIVERSITY: Peter Sheppard, University of Louisiana at Lafayette				
A	**B**	**C**	**D**	**E**
Description	**Type of Matching Funds (Cash or In-Kind)**	**Partner Providing Matching Funds (University, District, School, or Private)**	**Source of Funds (Federal, State, Local, or Private)**	**Cost Share**
Staff:				
Peter Sheppard, Project Director	Cash	University	State	7,280.00
Peter Sheppard, Project Director (Fringe: $7280 x 35.44% during academic year)	Cash	University	State	2,580.00
				0.00
				0.00
				0.00
Sub-Total Staff Cost Share				**$ 9,860.00**
Participant Support:				
Facility Use of the Vermillion Conference Center (established rate for 120 hours over duration of grant)	In-Kind	District (LPSS)	Local	17,060.00
Materials for Students at $200 per teacher for 15 teachers	Cash	District (LPSS)	Local	3,000.00
Registration for the 2012 NCTM Regional Conference, $150 per teacher for 15 teachers		District (LPSS)	Local	2,250.00
Registration for the 2012 LATM Conference, $50 per teacher for 15 teacher	Cash	District (IPS)		750.00
Sub-Total Participant Support Cost Share				**$ 23,060.00**
Travel and Other Costs:				
Participant Travel to and from Meetings (8 cars @ 9 trips @50miles x .50)	Cash	District (IPS)	Local	1,800.00
				0.00
				0.00
Sub-Total Travel and Other Cost Share				**$ 1,800.00**
Indirect Costs:	**Cash**	**University**	State	**$ 21,020.00**
COST SHARING TOTAL				**$ 55,740.00**

LaSIP 2012-2013 Professional Development RFP

BUDGET NARRATIVE - FORM BN

PROJECT NAME: Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra

PROJECT DIRECTOR/UNIVERSITY: Peter Sheppard

A	B	C	D	E
Section 1				
Form BR Line Item	Staff Name and/or Title	Roles and Responsibilities	Cost Basis	Rationale/Justification
1	Peter Sheppard, PI	Responsible for oversight of entire project and will provide pedagogical content knowledge instruction for the project	One-half month summer salary for Summer 2012 and 1 month summer salary for 2013. The rate requested is 1/9 of Dr. Sheppard's academic year salary. During the academic year 10% of his work effort will be dedicated to the project and shown as a university cost share.	Planning and subsequent instructional plan equate to one month of work. Summer II will include planning instruction and collecting, analyzing, and reporting project data.
2	Kathleen Lopez, Co-PI	Responsible for mathematics content knowledge administered during project	One-half month summer salary for Summer 2012 and 1 month summer salary for 2013. The rate requested is 1/9 of Dr. Lopez's academic year salary.	Planning and subsequent instructional plan equate to one month of work. Summer II will include planning instruction and collecting, analyzing, and reporting project data
6	Christina Eubanks-Turner	Responsible for mathematics content knowledge administered during project	One-half month summer salary for Summer 2012 and 1 month summer salary for 2013. The rate requested is 1/9 of Dr. Eubanks-Turner's academic year salary.	Planning and subsequent instructional plan equate to one month of work. Summer II will include planning, instruction and collecting, analyzing, and reporting project data
6	Secretary/Student Worker	Summer Salary for Student Worker or Clerical Assistant for Academic Year 2012-13 and Summer 2012 and Summer 2013	$10 x 100 hours x 2 summers x 2 + $2000; $10 x 50 hours x 2 semesters+ $1000. Total of $3000	Clerical Assistant needed to assist with data collection and data entry
10	Fringe	Fringe Rate for the university is 35.44%	$34018 (Faculty Salary Total) x 35.44% (fringe rate) = $11524. In addition, the fringe on Dr. Sheppard's 10% effort during the academic year ($7280 x 35.44%) will be shown a cost share of $2580.	Current Fringe Rate
Section 2				
Form BR Line Item	Other Expenses	Description or Purpose	Cost Basis	Rationale/Justification
	Participant Stipends	The purpose of the stipends is to encourage participation among practicing teachers. Summer Session I and II will total 108 hours. An additional 31 hours of project activities will occur during the academic year.	30 teachers x $25 per hour x 139 hours = $104205	LaSIP allows up to $25 per hour for participant stipends. The rate is similar to normal per hour rate of teachers' academic year salaries
	Employer Contributions on Stipends	Standard university rate is 25.15.%	$104250 (Participant stipends) x 25.15% =$26219	Standard state rate is 25.15.%
	School Resource Materials	Provide teachers with resources that help to amplify PD instruction and to ensure high quality implementation of those instructional strategies	$300 per teacher x 30 teachers x 2 summers= $12000	Providing teachers with school resource materials will assist in having them implement strategies learned in the project
	Project Supplies	Essential materials needed for summer and academic year meetings, including but not limited to: journals, notebooks, binders, printing fees	Estimated cost for project supplies for two summers and academic year follow-up, $1000. An additional $5000 is requested to host the Early HEAT competition which is a major means of teacher's demonstrating impact on student achievement and thus meeting project objectives	Items are necessary for instructors and participants to engage in PD

	Staff Travel	The purpose of this travel allotment is to reimburse staff for travel to the 2012 LATM Math Conference	3 staff members x 300 = $900	LATM will be the largest conference of mathematics teachers in the state in 2012
	Participant Travel	The purpose of this travel allotment is to reimburse teachers for travel to the 2012 LATM Math Conference	30 teachers x $200 = $5000	LATM will be the largest conference of mathematics teachers in the state in 2012
	Indirect Cost	LaSIP allowable rate for indirect costs (8%) and unrecovered indirect shown as cost-share using the federally negotiated indirect rate (43% MTDC base for entire project - indirect amount requested from agency)	Request is sponsor limited, 8% MTDC, $57941 x 8% = $4635.28; UL Lafayette will show $21, 020 as cost-share in unrecovered indirect costs (federally negotiated indirect cost rate (43% MTDC) of entire project, the base of which is $24855, minus the requested indirect, $3835 (8% LaSIP's indirect cost rate) = $21,010.	LaSIP allowable rate for indirect cost

IBERIA PARISH SCHOOL BOARD

Children First

Department of Curriculum

1204 LeMaire Street
New Iberia, LA 70560-4813
Phone (337) 364-7641 ▫ Fax (337) 367-9611

Dale R. Henderson
Superintendent

C. Michael Judice
Assistant Superintendent
of Administration

Carey Laviolette
Assistant Superintendent
of Instruction

To: Whom It May Concern

From: Audrey W. Ausberry
Supervisor of Instruction, Grades 3 – 6

Subject: LaSIP Mathematics Grant, Grades 5 – 6
Partnering with ULL

Date: February 13, 2012

Iberia Parish Administrators, Supervisors and Teachers realize that quality instruction is always a requisite for high achievement. Therefore, we support and harness this opportunity in collaborating with the LaSIP funded professional development project for teachers of mathematics in grades 5 – 6.

We are seriously committed to its goals and also embrace the stated objectives of the program that focus on Algebra Strands: Expressions and Exponents using the Hands on Equations model and culminating with an interscholastic competition. The emphasis of algebra would ensure alignment across grade levels 5 – 6 with the Common Core Standards. We stand firm and assume responsibility for the ancillary costs involved that guarantees the effectiveness of this worthy endeavor:

<u>Estimated In-Kind Support/Title II Funds</u>

- Registration for LATM for 15 Teachers @ $50.00 = $750.00
- Mileage: 8 cars @ 9 trips @ 50 miles x $.50 = $1,800.00
- Observations of Teachers

Hopefully, the ten – fifteen (10 – 15) trained teachers will be capable in making an impact by redelivering the content, which is a long-term investment. They will also have increased content knowledge and be empowered with instructional strategies for increased student achievement.

Please accept our professional thanks for the shared vision and for including Iberia Parish Teachers in this project.

AWA/sj

Approved: Carey Laviolette
Carey Laviolette, Assistant Superintendent of Instruction

LAFAYETTE
PARISH SCHOOL SYSTEM

February 14, 2012

Virginia L. Rabalais
Supervisor
Grades K – 5
Math & Science

Randy Bernard
Supervisor
Grades 6 – 12
Math and Science

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Dr. Peter Sheppard
LaSIP Project Director
Foster Hall, Room 207
University of Louisiana at Lafayette
Lafayette, LA

Dear Dr. Sheppard:

The Lafayette Parish School System is dedicated to securing instructional resources and quality professional development for our teachers. Our partnership with the University of Louisiana at Lafayette is vital to this effort, and we fully support our involvement with the Louisiana Systemic Initiatives Project (LaSIP).

It is well known that significant differences in performance exist between students who live in poverty (receive free or reduced lunch) and those who do not. Providing teachers with quality professional development to meet their students' diverse academic needs is critical. We also know from past experience that those teachers who have participated in LaSIP projects and have used LaSIP pedagogy and strategies show improved math performance scores on LEAP 21 and iLEAP assessments. For these reasons, the LPSS fully supports the focus of the LaSIP grant which targets those teachers in schools where the majority of the population falls in this at-risk category.

To support this effort, LPSS is prepared to offer:

- the services of one Math Lead Teacher for ten days at $310 per day, as an in-kind contribution, negotiable depending upon the number of teachers participating in the project needing assistance and observations,
- the use of the Vermilion Conference Center for training, not to exceed a cost of $17, 060, as an in-kind contribution,
- the purchase of student materials at $200 per teacher not to exceed $5000 if funds are available
- registration for the 2012 NCTM regional meeting in Dallas on October 10-12, 2012 at a rate of $150 per teacher if funds are available.

We are assuming that the University of Louisiana at Lafayette will act as the fiscal agent for this project.

The Lafayette Parish School System commends the Louisiana Department of Education and the University of Louisiana at Lafayette for its continued partnership with the school districts in an effort to provide quality professional development to teachers of mathematics.

Sincerely,

Approved: Katherine Landry, Deputy Superintendent, Instructional Services

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS

Measureable Objectives Worksheet (1)

Aligned with the first LaSIP goal stated below, design at least two measureable objectives which answer each of the following five questions:

(1) **Who** is involved?
(2) **What** is the desired outcome?
(3) **How** will progress be measured?
(4) **When** will the outcome occur?
(5) What is the **level of proficiency**?

Refer to page _____ for a detailed explanation of each question. Combine the five answers to form a sentence for your measureable objective. Use the checklist provided on page ___ to ensure the objectives contain all necessary components. This page may be duplicated if additional objectives are desired.

LaSIP Goal 1: ***Increase student achievement on State high-stakes testing.***

Who: Students of LaSIP trained teachers, specifically from our project
What: A statistically significant positive difference between Spring 2012 standardized test scores and Spring 2013 standardized test scores

How: Analyzing scores on standardized test

When: Pre-test scores in Fall 2012; Post-test in Spring 2013

Proficiency Level: A statistically significant difference at p value of .05 level.

Goal 1, Objective 1: As a result of this project, students of LaSIP trained teachers will show a statistically significant increase from their prior year's standardized test scores.

Who: Student participants in the Early HEAT Competition trained by project participants

What: A statistically significant positive difference between pre and post test scores.

How: Scores on project-developed pre and post test measure. Measure will be aligned with Common Core Standards

When: Pre-test no later than mid September 2012; Post test 1st week in December (after 15 hours of instruction)

Proficiency Level: A statistically significant difference at p value of .05 level.

Goal 1, Objective 2: *As a result of this project, students of LaSIP trained teachers will show a statistically significant increase in their knowledge of foundational algebra using a pre-post test measure of algebraic proficiency.*

2012-13 LaSIP PROFESSIONALDEVELOPMENT PROJECTS

Measureable Objectives Worksheet (2)

Aligned with the first LaSIP goal stated below, design at least two measureable objectives which answer each of the following five questions:

(1) **Who** is involved?
(2) **What** is the desired outcome?
(3) **How** will progress be measured?
(4) **When** will the outcome occur?
(5) What is the **level of proficiency**?

Refer to page _____ for a detailed explanation of each question. Finally, combine the five answers to form a sentence for your measureable objective. Use the checklist provided on page 44 to ensure the objectives contain all necessary components. This page may be duplicated if additional objectives are desired.

LaSIP Goal 2: ***Plan effective PD based on the high-need LEA(s)/schools' data-driven needs and developed using research-based PD strategies that will take place in summer institutes, during the academic year (AY), and/or through on-line or web-based assignments and job-embedded activities.***

Who: Teacher Participants

What: Statistically significant increase in their pre-test and post-test scores on measures of mathematics content knowledge

How: Using measures of mathematics content knowledge (pre-test compared to post-test)

When: End of Summer Session I, July 2012 and end of Summer Session II, July, 2013

Proficiency Level: A statistically significant difference with a p value of .05.

Goal 2, Objective 1: *As a result of this project, participants will demonstrate a statistically significant increase in their pre-test and post-test scores on measures of mathematics content knowledge*

Who: Teacher Participants

What: Statistically significant increase in their pre-test and post-test scores on measures of pedagogical content knowledge

How: Using measures of mathematics content knowledge (pre-test compared to post-test)

When: End of Summer Session I, July 2012 and end of Summer Session II, July 2013

Proficiency Level: A statistically significant difference with a p value of .05

Goal 2, Objective 2: *As a result of this project, participants will demonstrate a statistically significant increase in their pre- test and post-test scores on measures of pedagogical content knowledge*.

(Form 5- 2012-13 LaSIP PD, Revised 8/ 2011 additional sheets may be duplicated as necessary)

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS

Measureable Objectives Worksheet (3)

Aligned with the first LaSIP goal stated below, design at least two measureable objectives which answer each of the following five questions:

(1) **Who** is involved?
(2) **What** is the desired outcome?
(3) **How** will progress be measured?
(4) **When** will the outcome occur?
(5) What is the **level of proficiency**?

Refer to page _____ for a detailed explanation of each question. Finally, combine the five answers to form a sentence for your measureable objective. Use the checklist on provided on page 44 to ensure the objectives contain all necessary components. This page may be duplicated if additional objectives are desired.

LaSIP Goal 3: Increase leadership capacity and pedagogical skills for target schools through school/district buy-in, school-based implementation, and mentoring during the AY.

Who: Teacher Participants

What: Implement Concrete Strategies introduced in Summer Sessions

How: Teachers lesson plans, and unit plans will be assessed. Teachers work with Early HEAT teams and will be monitored by lead teachers and project staff.

When: Academic Year 2012-13

Proficiency Level: Teachers will need to complete at least 15 lessons using instructional strategies addressed in Summer Session

Goal 3, Objective 1: *Participants will create and implement at least 15 instructional lessons that model algebraic concepts using concrete representations*

Who: Teacher Participants

What: Implement deep problem solving activities.

How: Teachers lesson plans, and unit plans will be assessed and we will conduct 2 formal observations of teaching.

When: May 2013 (informal assessment will be taken during entire project)

Proficiency Level: Teachers must complete 15 problem solving lessons.

Goal 3, Objective 2: *Participants will create and implement at least 15 algebraic problem solving activities that embed critical thinking skills*

Section 1.01 *CURRICULUM VITAE*

Name **Peter Sheppard**		**Current Position Title: Associate Professor** **Project Position Title: Director/Principal Investigator**	
EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.			
INSTITUTION AND LOCATION	**DEGREE**	**YEAR CONFERRED**	**FIELD OF STUDY**
Southern University – BR **Southern University – BR** **Southern University – BR** **Southern University - BR**	**Bachelor of Arts** **Masters of Education** **Masters Equivalent** **Doctor of Philosophy**	**1998** **1999** **2003** **2005**	**Elementary Ed. (1-8)** **Ed. Administration** **Mathematics** **Mathematics Education**

Professional Career Experience

2009 - **Associate Professor,** University of Louisiana at Lafayette, College of Education, Department of Curriculum and Instruction

2006-09 Assistant Professor, University of Louisiana at Lafayette, College of Education, Department of Curriculum and Instruction.

2003-2006 Program Manager, STEM Teacher Preparation, Louisiana State University; Adjunct Professor, Dept of Curriculum and Instruction.

1998-2003 Teacher/Instructor, Southern University Laboratory School, middle school mathematics and science. Head Coach -Varsity Track, Asst Coach - Football

Publications

1. **Sheppard, P**. (2011).Experience-Centered Instruction as a Catalyst for Teaching Mathematics Effectively to African American Students. *Journal of Negro Education*, 80(3): 254-265.
2. Ma, Y**., Sheppard, P., &** Williams, D. (2011**)** Engaging Elementary Mathematics Teachers in Developing a Mathematics Teaching Case Library. Proceedings form the Society for Instructional Technology Education Annual Meeting, Nashville, TN**.**
3. Sheppard, P. (2009) Prospective Teachers Experiences Teaching Mathematics to African American Males. *Education*, 130(2): 226-231.
4. Sheppard, P. (2009). Putting the "Teacher" in Teacher Preparation. Empowering Mentors of Teachers of Mathematics. NCTM, Reston, VA
5. Sheppard, P. (2009). Louisiana's Educational Accountability System: Highly Ranked at What Cost*? Southeastern Teacher Education Journal,* (2) 2: 57-62.
6. Sheppard, P. (2006). Successful Mathematics Students in Academically Unacceptable High Schools. *Education* (126) 4: 609-620.
7. Sheppard, P. (2006) Recruiting & Preparing STEM Majors for Teaching in Urban Settings. *Journal of Urban Education: Focus on Enrichment*
8. Sheppard, P. (2005). Redefining the Role of Science and Math Mentors. *Academic Exchange Quarterly* (9) 4: 229-233.
9. Sheppard, P., Cartledge, F. & Nixon, B. (2004) Preparing Science and Mathematics Teachers for Grades 7-12: A Community of Scholars at Work. *Proceedings from the*

National Science Foundation STEM Teacher Preparation PI Conference, Arlington, VA

.

Selected National Presentations

1. Sheppard, P. (2012, April) **Using *TCM* to Assist Students with Hidden or Unmet Potential. National Council for Teachers of Mathematics Conference, Philadelphia, PA.**
2. **Sheppard, P. (**2011, November**).** *Engendering Algebraic Readiness through H.E.A.T.* School Science and Mathematics Association Convention, Colorado Springs, CO.
3. **Sheppard, P.** (2011, April). A Critical Analysis of Papers Submitted to "Approaches to Success Gendered Analysis of African Americans in STEM" AERA session. American Educational Research Association, Annual Meeting, New Orleans, LA (Discussant).
4. Sheppard, P. (2009, April). *Towards Merging the Experiences of African American Students with the Mathematics Curriculum*. American Educational Research Association Annual Meeting, San Diego, CA
5. Sheppard, P. (2007, November) Using Service Learning to Enhance Pedagogical Development in Elementary Mathematics. School Science and Mathematics Association, Indianapolis, IN.
6. Sheppard, P. (2006, April). *Successful Mathematics Students in Academically Unacceptable High Schools.* Annual Meeting of the American Educational Research Association. San Francisco, CA.
7. Sheppard, P. (2006, April). *A Collaborative Approach to Recruiting and Developing Highly Qualified Science and Mathematics Teacher Candidates*. Annual Meeting of the American Educational Research Association. San Francisco, CA.

Courses Taught

Math Methods for Elem. and Middle School Majors (University of Louisiana – Lafayette); Education Schooling & Society (Louisiana State University); Principles of Education (Southern University)

Selected Grant Funded Projects

1. **Sheppard, P**., Ma, Y, Lopez, K., & Williams, D. (2010 - present). *Utilizing Student Responses as Catalysts for Improving Mathematics Teacher Knowledge*. Louisiana Board of Regents, Louisiana Systemic Initiatives Program **$265,043**.
2. **Sheppard**, P & Carlson, G. (2010 - present), CITAL Sub-grant from Louisiana Board of Regents, Statewide Value-Added Qualitative Research Project, **$40,000**.
3. **Sheppard, P.** (2010 - Present). HEAT II - *Hands-On Exposure to Algebraic Topics* . US Dept of Ed/ Lafayette Parish School System GEAR-UP Sub-grant., **$41,000**.
4. Jumonville, M**. & Sheppard, P.** (2010 - Present). STEPS (Secondary Teachers Engaged In Problem Solving. US Dept of Ed/ Lafayette Parish School System GEAR-UP Sub-grant., **$35,000**.
5. **Sheppard, P**., Lopez, K., & Keller, M (2009-10) *Improving the PACS of Middle Grades Teachers II*, Louisiana Board of Regents, Louisiana Systemic Initiatives Program **$187,164**
6. **Sheppard, P.** (2009 -10). *Hands-On Exposure to Algebraic Topics* (HEAT). US Dept of Ed/ Lafayette Parish School System GEAR-UP Sub-grant., **$39,847**.
7. **Sheppard, P**., Lopez, K. and Keller, M. (2008) *Improving the PACS (Pedagogical Assessment and Content Skills) of Middle Grades Teachers*. Louisiana Board of Regents, **$206,792**.

2011-2012 PROFESSIONAL DEVELOPMENT PROJECTS

CURRICULUM VITAE

Name: Christina Eubanks-Turner	**Current Position Title: Assistant Professor** **Project Position Title: Co-Principal Investigator**

EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Xavier University of Louisiana	**B.S.**	**2002**	**Mathematics**
University of Nebraska-Lincoln	**M.S.**	**2004**	**Mathematics**
University of Nebraska-Lincoln	**Ph.D.**	**2008**	**Mathematics**

RESEARCH AND PROFESSIONAL EXPERIENCE: DO NOT EXCEED TWO PAGES. Begin with present position, list in reverse chronological order previous relevant employment, experience, and honors.

Academic Positions

2008–Present, University of Louisiana at Lafayette(ULL), Dept. of Mathematics, Assistant Professor
2002–2008, University of Nebraska–Lincoln(UNL), Dept. of Mathematics, Graduate Teaching Assistant

Teaching Experience

Article I. I**nstructor of Record, ULL, 2008-Present:** Calculus(MATH 270), Applied Calculus (MATH 250), **Number Theory and Abstract Algebra for High School Teachers (MATH 414)**, Linear Algebra (MATH 462), Modern Algebra I (MATH 465), Modern Algebra II (MATH 466)

Article II. **LSU, Louisiana Math and Science Teacher Institute (LAMSTI), Summer 2010:** Pre-Thesis Seminar Instructor (MATH M4999) Guest Lecturer in Leadership Seminar (EDCI 6300)

Article III. **Instructor of Record, UNL, 2002-2008:** Intermediate Algebra (MATH 100A Instruction supplemented by MathXL), College Algebra (MATH 101), Mathematics Matters for Elementary Teachers (MATH 300), NU-Teach Institute: Functions of Algebra and Geometry (MATH 802T)

Other Instructor Positions

- Undergraduate Research Leader, Lead a group of undergraduates in summer research on Coding Theory at ULL, Summer 2011.
- Graduate Mentor Assistant, UNL, Co-facilitated algebra problem sessions for pre-graduate students during Intensive Mathematics: a Mentoring, Education, and Research Summer Experience(IMMERSE), Summer 2007.

- Project Fulcrum Teaching Fellow, Park Middle School, Lincoln, NE, Collaborated with middle school math and science teachers to enhance the mathematics and science curriculum for grades 6-8, Fall 2004-Spring 2005.

Awards

- AWM Workshop for Women Graduate Students and Recent PhDs participant, JMM, New Orleans, LA, January 2011: Selected to give a 20 minute talk.
- LA/MS Section NExt Fellow, March 2009 -Present: Selected to be a fellow of Section NExT, a professional development program of the MAA for new math faculty.
- Project NExT Fellow, June 2008 -Present: Selected to be a fellow of Project NExT, a professional development program of the MAA for new math faculty.
- Educational Testing Service (ETS) Visiting Scholar, Princeton, NJ, June 2008: Selected to participate in a month long program at ETS that examines diversity and fairness issues with some of the ETS testing products.
- AWM Workshop for Women Graduate Students and Recent PhDs participant, JMM, San Diego, CA, January 2008: Selected to give a poster presentation at the workshop.
- Mentoring Through Critical Transition Points, UNL Math Dept., January 2006 -August 2006: This annual graduate traineeship is awarded to a fourth- and fifth-year mathematics graduate student at UNL.
- Certificate of Recognition for Contributions to Students, UNL Teaching Council and Parent's Association; February 5, 2007: This annual award is given to faculty and sta_ through student nominations.
- Graduate Assistance in Areas of National Need Fellowship, UNL Math Dept, 2005 {-2006: This federally funded fellowship is awarded yearly to graduate students studying in academic areas of national need.
- Project-Fulcrum Fellowship, UNL, 2004 { 2005: This fellowship is offered yearly to 8-15 graduate students at UNL in the fields of science and math through a partnership with Lincoln Public Schools.

Publications

- C. Eubanks-Turner, Prime Ideals of Two-Dimensional Quotients of Power Series Rings (submitted).
- C. Eubanks-Turner, I. Fene, M. Gonzalez, J. Johnson, M. Lennon, K. Pr'Out, List Decoding Algorithms for Reeds-Solomon Codes (to appear, National Technical Association 2011 conference proceedings).
- E. Celikbas, C. Eubanks-Turner, The Projective Line Over the Integers (to appear, the book Progress in Commutative Algebra. Ring Theory, Homology, and Decompositions).
- C. Eubanks-Turner, M. Luckas, and S. Saydam, Prime ideals in birational extensions of two-dimensional power series rings (to appear, Communications in Algebra).

Presentations by Invitation

- Making Myself Useful..., Mathematics Education Seminar, UNL, Lincoln, NE, October 20, 2011.
- Error Detection and Correction, Center for Undergraduate Research in Mathematics Spring Research Conference, Brigham Young University, Provo, UT, March 18, 2011.
- Mad Veterinarian, Acadiana Math Teachers' Circle Summer Retreat, Vermillion Conference Center, Lafayette, LA, June 29, 2010.
- Prime Ideals in Birational Extensions of Power Series Rings, Special Session in Commutative Ring Theory, AMS Spring Sectional Meeting, Macalester College, St. Paul, MN, April 10, 2010.
- Prime Ideals in Low-Dimensional Mixed Polynomial/Power Series Rings, The Granville-Brown-Hayes Session of Presentations by Recent Doctoral Recipients, The Joint Mathematics Meetings, Washington, D.C., January 7, 2009.
- Prime Ideals in Birational Extensions of Power Series Rings, Algebra Seminar, ULL, March 2010.

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS

CURRICULUM VITAE

Name Kathleen Lopez	**Current Position Title Assistant Dept Head & Associate Professor of Mathematics** **Project Position Title Co-PI**

EDUCATION (Begin with baccalaureate or other initial professional education and include postdoctoral training.

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
University of Louisiana at Lafayette	B.S.	1972	Mathematics
University of Louisiana at Lafayette	M.S.	1982	Applied Mathematics
University of Louisiana at Lafayette	Ph.D.	1993	Mathematics

TEACHING AND ADMINISTRATIVE EXPERIENCE

- Assistant Head of the Department of Mathematics, UL Lafayette, January 2008 – present
- Associate Professor, Department of Mathematics, UL Lafayette, August 2010 – present (Assistant: 2002-2010)
- Department Head of Natural Sciences, Coordinator of Mathematics Component, Developer of Mathematics Curriculum, and Assistant Professor; South Louisiana Community College, June 1998 - August 2002
- Instructor in Department of Mathematics; UL Lafayette, 1982 - 1998 (Director of Freshman Mathematics and Supervisor of Mathematics Teaching Assistants, January 1988 - May 1995)

TEACHING HONORS

- Alpha Lambda Delta Freshman Honor Society Freshman Professor of the Year for 2008
- Louisiana-Mississippi Section MAA Award for Distinguished College or University Teaching of Mathematics, 2001
- Nominee of the Department of Mathematics for the UL Lafayette Outstanding Teacher Award, 1995

RESEARCH

- *Endomorphisms and the Lattice of Group Topologies*, Dissertation, May 1993

TEXTBOOKS

- *A Mathematical Foundation for Elementary Teachers* (with P. Jones and L. Price), Addison - Wesley 1997

Textbooks/Course Materials Written and Used at UL Lafayette's Department of Mathematics

- *Mathematics for Business Decisions* (MATH 202)
- *Probability, Statistics, and Number System for PK-8 Teachers*, with L. Price and V. Schneider, 2005, (MATH 317)
- *Proportional Reasoning and Problem Solving for Teachers*, with P. Jones and L. Price, 2003, (MATH 327)
- *Integrated Collegiate Mathematics* with B. Clark; 1994 (MATH 107 from 1994 to 2002)
- *Understanding Numbers: A Prelude to Algebra* (with P. Jones), Ginn Press; 1992 (MATH 91)
- *Applications of Arithmetic for Elementary Teachers* (with P. Jones); 1986 (MATH 80)

FUNDED GRANTS

- National Science Foundation: *The Louisiana Noyce Teaching Fellows/Master Teaching Fellows Capacity Building Project,* CoP.I. (C. Eubanks-Turner, Mathematics, P.D. with P.Beaulieu (Mathematics), and Peter A. Sheppard (Education Curriculum & Instruction), August 15, 2011 - July 31, 2012, $127,449
- LaSIP/LA BOR: *A TEAM (Tactile Experiences with Algebraic Models) Approach to Improving Algebraic Proficiency in the Middle Grades*, June 1, 2011 - June 30, 2012 Co-P.I., (P. Sheppard, EDCI, P.D.) $259,629
- LaSIP/LA BOR: *Utilizing Student Responses as Catalysts for Improving Mathematics Teacher Knowledge*, June 1, 2010 - June 30, 2011, Co-P.I., $333,621
- LaSIP/LA BOR: *Improving the PACS (Pedagogy, Assessment and Content Skills) for Middle School Mathematics Teachers,* December 2009 - June 2010, Co-P. I., $187,164.
- LA BoR Support Fund: *Strengthening the Analytical Thinking and Mathematical Decision-Making Skills of Business Students in a Finite Mathematics Course*, P.D., UL Lafayette, 2008-2009, $80,359

- LaSIP/LA BOR: *Improving the PACS (Pedagogy, Assessment and Content Skills) for Middle School Mathematics Teachers*, June 2008- December 2009, Co-P. I., $206,792
- **LA BoR Support Fund:**
  - Traditional Enhancement: *Enhancing the Mathematical Preparation of Pre-Service PK - 8 Teachers*, P.D., UL Lafayette, 2005-2006, $77,447
  - Education Enhancement: *Project GAP (Gaining Academic Performance)* - Senior Associate, UL Lafayette, 2005-2006
  - Education Enhancement: *Developing Problem Solving in the Middle School and Secondary Mathematics Curricula*, UL Lafayette, 2002-2003, P.D./co-P.I., $63,382
  - Undergraduate Enhancement*: Making Mathematics and Science Learning Resources Accessible*, 2001-02, SLCC, P.D./co-P.I., funded $97,000 (grant stayed at SLCC)
- LaSIP/LA BOR: *UL Lafayette and SLCC Mathematics Preservice Initiative* 2001, co - P.I.
- SLCC Campus Renewal Project, LaCEPT (LA Board of Regents), 1999 - 2000, P.D.
- SLCC Campus Renewal Project, LaCEPT (LA Board of Regents), 1998 - 1999, P.D.
- UL Lafayette Campus Renewal Projects, LaCEPT (NSF/Board of Regents), 1994, 1995, 1996, 1997, senior associate

FACULTY DEVELOPMENT WORKSHOPS CONDUCTED (MOST RECENT)

- **LaSIP (Louisiana Systemic Initiative Program/Board of Regents) for In-Service Teachers:**
  - *A TEAM (Tactile Experiences with Algebraic Models) Approach to Improving Algebraic Proficiency in the Middle Grades)*, July 5 - 15, 2011 (with P. Sheppard in EDCI and C. Eubanks-Turner in Mathematics)
  - *Utilizing Student Responses as Catalysts for Improving Mathematics Teacher Knowledge*, Algebra Strand, May 31, - June 10, 2011, Co-P.I., (with P. Sheppard in EDCI, and M. Jumonville in Mathematics)
  - *Utilizing Student Responses as Catalysts for Improving Mathematics Teacher Knowledge*, Number and Number Relations Strand -- July 1 - 16, 2010 (with P. Sheppard in EDCI, and M. Keller in Mathematics)
  - *Improving the PACS (Pedagogy, Assessment and Content Skills) of Middle Grade Mathematics Teachers* (with P. Sheppard and M. Keller); Data Analysis Strand: May 22, June 1 – 11, 2010; Algebra Strand: June 1 - 18, 2009; and Number and Number Relations Strand: June 2 - 19, 2008
- UL Lafayette/LA BoR Workshop: *Mathematical Content Courses for PK-8 Teachers* (with L. Price, P. Jones and V. Schneider), May 22 - 26, 2006
- UL Lafayette/ LA BoR Project GAP Workshop for In-Service:
  for Middle School Teachers in St. Martin Parish, Louisiana (with J. Cain), August 1 - 2, 2005
  for Secondary School Teachers in St. Martin Parish, Louisiana (with J. Cain), August 3 - 4, 2005
- UL Lafayette/LA BoR Workshop: *Problem-Driven Courses in the Mathematics Pre-Service Curricula*, 2004

SELECTED PRESENTATIONS AND PANELS

- National meetings of MAA (2010, 2007, 2006, 2005, 2004) and AMATYC (2007, 1999, 1998) -- most recent:
  - Joint AMS-MAA: "Redesigning a Mathematics Course to Meet the Needs of Business Majors", January 2010
  - AMATYC: " My Secret Function: A Class Activity for Teaching Operations on Functions", November 2007
  - Joint AMS- MAA: "A Problem-Solving Course for Pre-Service Middle School Teachers", January 2007
- State and regional conferences -- most recent:
  - "The Brady Bunch Does Calculus" LA/MS Section of MAA Meeting, Oxford, MS, February 26, 2011
  - ‘‘Not Average But Normal", LA Association of Teachers of Mathematics, Monroe, LA, October 20, 2011
  - "Inverting Your World" , NCTM Regional Conference, New Orleans, LA, October 29, 2010

OTHER RECENT PROFESSIONAL ACTIVITIES RELATED TO THE PREPARATION OF TEACHERS

- Member of the UL Lafayette PARCC Campus Leadership Team (PARCC is the Partnership for Assessment of the Readiness for Colleges and Careers - a consortium of 25 states working to development an assessment of the Common Core State Standards for Grades K-12)
- Member of UL Committee to compile the NCATE NCTM SPA Report for Secondary Mathematics, 2007 – 2008
- Invited member of a national Mathematical Association of America task force to review the materials developed by INTEL for online faculty development of in-service middle school teachers - Spring 2010
- Participated in "Enacting Standards for Mathematical Practices Conference", organized by University of Nebraska - Lincoln's Center for Science, Mathematics & Computer Science Education, Oct 21-22, 2011
- Participates in monthly meetings of the Acadiana Mathematics Teachers Circle - a problem-solving group of Middle School Mathematics Teachers (Fall 2009 - present)

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS
CURRENT AND PENDING SUPPORT

List all State and federal funding support for each IHE faculty member during the funding cycle. Duplicate this form for each IHE faculty member, and use additional sheets as necessary.

NAME OF FACULTY: Peter Sheppard

Status of Support: Pending

Proposal Title (or Semester Teaching Support): Early H.E.A.T as Catalyst for Mastering the Common Core Standards

Source of Support: Louisiana Board of Regents/LaSIP

Award Amount (or Monthly Teaching Rate): $177,491 Period Covered: July 2011 – June 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: 10% AY and 1 month each Summer 2012 & Summer 2013

Status of Support: Current

Proposal Title: **.A TEAM (Tactile Experiences with Algebraic Models) Approach to Improving Algebraic Proficiency in the Middle Grades .**

Source of Support: Louisiana Board of Regents/LaSIP

Award Amount (or Monthly Teaching Rate): $227,579,043 Period Covered: July 2011, - June 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: 2 months – Summer 2011 & 2012

Status of Support: Current

Proposal Title(or Semester Teaching Support): Statewide Value-Added Qualitative Research Project

Source of Support: CITAL/Louisiana Board of Regents

Award Amount (or Monthly Teaching Rate): $40,000 Period Covered: July 2010 – June 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: 20% AY (2010-11)

Status of Support: Current

Proposal Title (or Semester Teaching Support): High School HEAT - *Hands-On Exposure to Algebraic Topics*.

Source of Support: US Dept of Ed/ Lafayette Parish School System GEAR-UP Sub-grant

Award Amount (or Monthly Teaching Rate): $51,454 Period Covered: July 2011 – June 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: 5% AY and ½ month Summer 2012

Status of Support: Current

Proposal Title (or Semester Teaching Support): The Louisiana Noyce Teaching Fellows/Master Teaching Fellows Planning Project.

Source of Support: National Science Foundation

Award Amount (or Monthly Teaching Rate): $127,449 Period Covered: July 2011 – June 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: 10% AY and 1 month Summer 2012

LOUISIANA SYSTEMIC INITIATIVES PROGRAM
2012-2013 PROFESSIONAL DEVELOPMENT PROJECTS
CURRENT AND PENDING SUPPORT

List all State and federal funding support for each IHE faculty member during the funding cycle. Duplicate this form for each IHE faculty member, and use additional sheets as necessary.

NAME OF FACULTY: Christina Eubanks-Turner

Status of Support: Pending

Proposal Title (or Semester Teaching Support): *Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra*

Source of Support: LaSIP/LA BoR

Award Amount (or Monthly Teaching Rate): $ Period Covered: July 1, 2012 – June 15, 2013

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: Cal Yr AY 0.5 mo Summer '12 & 1 mo Sum '13

Status of Support: Current

Proposal Title (or Semester Teaching Support): Smooth Transition for Advancement to Graduate Education (STAGE) for Underrepresented Minorities in Mathematical Sciences: A Pilot Project

Source of Support: National Science Foundation

Award Amount (or Monthly Teaching Rate): $548,880 Period Covered: 6/11-8/13

Location of Activity: University of Louisiana at Lafayette

Person-Months or % of Effort Committed to the Project: 2 summer months AY

Status of Support: Current

Proposal Title(or Semester Teaching Support): The Louisiana Noyce Teaching Fellows/Master Teaching Fellows Planning Project

Source of Support: NSF

Award Amount (or Monthly Teaching Rate): $127; 449 Period Covered:8/11-7/12

Location of Activity: University of Louisiana at Lafayette
Person-Months or % of Effort Committed to the Project: 10% Cal Yr AY 1 Summer month

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Status of Support: Current

Proposal Title (or Semester Teaching Support): A TEAM (Tactile Experiences with Algebraic Models) Approach to Proficiency in the Middle Grades

Source of Support: LaSIP

Award Amount (or Monthly Teaching Rate): 259; 629 Period Covered 4/11-6/12

Location of Activity: University of Louisiana

Person-Months or % of Effort Committed to the Project: Cal Yr AY 1Summer

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS
CURRENT AND PENDING SUPPORT

List all State and federal funding support for each IHE faculty member during the funding cycle. Duplicate this form for each IHE faculty member, and use additional sheets as necessary.

NAME OF FACULTY: Kathleen Lopez

Status of Support: Current Pending x Submission Planned in Near Future

Proposal Title (or Semester Teaching Support): *Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra*

Source of Support: LaSIP/LA BoR

Award Amount (or Monthly Teaching Rate): $ Period Covered: July 1, 2012 – June 15, 2013

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: Cal Yr AY 0.5 mo Summer '12 & 1 mo Sum '13

Status of Support: x Current Pending Submission Planned in Near Future

Proposal Title(or Semester Teaching Support): *Noyce Teaching Fellows/Master Teaching Fellows Capacity Building Project*

Source of Support: National Science Foundation

Award Amount (or Monthly Teaching Rate): $127,449 Period Covered: August 15, 2011 - July 31, 2012

Location of Activity: UL Lafayette, Lafayette, LA

Person-Months or % of Effort Committed to the Project: Cal Yr 20% of Sp 12 AY 1 mo. Summer 2012

Status of Support: x Current Pending Submission Planned in Near Future

Proposal Title (or Semester Teaching Support): *A TEAM (Tactile Experiences with Algebraic Models) Approach to Improving Algebraic Proficiency in the Middle Grades*

Source of Support: LaSIP/LA BoR

Award Amount (or Monthly Teaching Rate): $259,629 Period Covered : June 1, 2011 - June 30, 2012

Location of Activity: Lafayette, LA

Person-Months or % of Effort Committed to the Project: Cal Yr AY 1 mo Summer 2012

2012-13 LaSIP PROFESSIONAL DEVELOPMENT PROJECTS
Memorandum Of Agreement Among Partners

Univversity of Louisiana at Lafayette (Name of Sponsoring Institution or Institutions)	*Early H.E.A.T (Hands-On Exposure to Algebraic Topics) as a Catalyst for Mastering Critical Foundations of Algebra* (Project Title)
Peter Sheppard (Principal Investigator)	Kathleen Lopez and Christina Eubanks-Turner (Co- Principal Investigators)

This cooperative agreement reflects the overall commitment as well as the specific responsibilities and the roles of each of the partners listed below. This MOA documents the actual working partners who are responsible for contributing to the writing of the proposal, collecting and reporting data, and for the day to day success of the project.

Type of Partner	Name of Active Partner	Title	IHE or District & School	Signature
Teacher Preparation Program ***(Required)***	Peter Sheppard	Associate Professor	University of Louisiana at Lafayette	
Dept./School of Arts & Sciences ***(Required)***	Kathleen Lopez,	Assistant Chair, Associate Professor	University of Louisiana at Lafayette	Kathleen Lopez
High-need Local Education Agency/Agencies ***(LEA – Required)***	Carrie Laviolette	Assistant Superintendent	Iberia Parish Schools	Carey Laviolette
Additional Targeted Partners	Randy Bernard	Math/Science Supervisor	Lafayette Parish Schools	

(Form 8 - 2012-13 LaSIP PD, Revised 7/2011)

Memorandum of Agreement Among Partners (cont.)

Sponsoring Institution: University of Louisiana at Lafayette

Principal Investigator: Peter Sheppard

Type of Partner	Name	Title	IHE or District & School	Signature
Additional Partners	Christina Eubanks Turner	Assistant Professor, Mathematics	University of Louisiana at Lafayette	
Additional Partners	Audrey Ausberry	Supervisor of Elementary Mathematics	Iberia Parish Schools	
Additional Partners	Virginia L. Rabalais	Supervisor of Elementary Mathematics	Lafayette Parish Schools	

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Cooperative Planning Efforts

Describe the process of collaboration between the high-need LEA(s), other targeted schools, and the IHE(s) in determining the needs of the LEA(s) in planning and writing this proposal. The statement should be endorsed and dated by an official from each participating institution. In addition, Letters of Support must be included in the appendices of the proposal.

	Typed Name, Title, Organization	Signature	Date
1.	Peter Sheppard, Associate Professor, University of Louisiana at Lafayette		2/15/12
2.	Christina Eubanks-Turner, Assistant Professor, University of Louisiana at Lafayette		2/15/12
3.	Kathleen Lopez, Associate Professor, University of Louisiana at Lafayette		2/15/12
4.	Carey Laviolette, Assistant Superintendent, Iberia Parish Schools		2/14/2012
5.	Audrey Ausberry, Elementary Supervisor, Iberia Parish Schools		2/14/2012
6.	Randy Bernard, Math/Science Supervisor, Lafayette Parish Schools		2/16/2012
7.	Virginia Rabalais, Elementary Supervisor, Lafayette Parish Schools		2/16/2012
8.	Carolyn Bruder, Interim Provost		2/16/12
9.			
10.			

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APPENDIX J: Stipend Options

You must choose either Option A or B for use in your project, and document your choice in your proposal. Should your proposal be funded, you must provide this information to your participants within a Participant Agreement or Project Syllabus. For either option, you must insert the number of days and hours for your project and the hourly stipend rate, and provide a list of your project deliverables. Projects must provide a total stipend hourly rate at a minimum of $20 per hour and a maximum of $30 per hour. LaSIP encourages the use of Option B.

Option A

Attendance is expected for all ___22___ days (total of 139 hours) of the project. Participants will receive a maximum fee of $**25** per hour for attendance participation at the summer institute and academic year workshops. Payment will be made only on approval of and documentation from the principal investigator, *(Peter Sheppard),* according to the LaSIP Attendance Policy. Participant will be paid only for the actual hours he/she participates in the professional development program. If the Participant has unexcused absences for more than 15% of the scheduled program hours, Participant may be dropped from the program at the discretion of the principal investigator and will not be eligible to receive instructional materials from the project. Any instructional materials already received must be returned to the principal investigator. LaSIP Attendance Policy regarding unexcused absences will be enforced.

Option B

Attendance is expected for all ____ days (total of ____ hours) of the project. Participant will receive a $**20** per hour for attendance participation at the summer institute. Upon completion of the required activities/deliverables (designed by PI) and days of attendance during the AY, participant will receive the remaining $**5** for each full hour attended during the summer project. This will in effect raise the stipend rate to $**25** per hour attended and will only apply if participant meets required obligations. Stipends for the AY workshops will be $**25** per hour for attendance. Payment will be made only on approval of and documentation from the principal investigator, *(Name of authorized person),* according to the LaSIP Attendance Policy. Each participant must complete the assigned deliverables during the AY. If the participant has unexcused absences for more than 15% of the scheduled program hours, the participant may be dropped from the program at the discretion of the principal investigator and will not be eligible to receive either instructional materials from the project or the additional $**5** per hour for attendance participation at the summer institute. In this event, any instructional materials already received must be returned to the principal investigator. LaSIP Attendance Policy regarding unexcused absences will be enforced.