Validating the Collaborative Regional Education (CORE) Comprehensive Model: Technology in Rural Classrooms

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Investing in Innovation Validation Grant Proposal - Jacksonville State University

Response to Priorities

Absolute Priority 4- Effective use of Technology

This CORE model includes integrating technology in classrooms and providing teachers with professional development that prepares them for using technology as a tool that supports individualized learning. Technology in the classroom isn't always a simple solution in rural communities, where access to wireless networks is not always available. This project will assess the needs of school systems, assist them in making technology plans for access and hardware, and also provide some funding for creating learning environments that allow students to use technology to support access, individualized learning and development of 21st century skills that prepare students for college and career.

Absolute Priority 5- Serving Rural Communities

Jacksonville State University's Collaborative Regional Education (CORE) model will be used to improve college and work readiness among 8th-12th grade students in primarily high need and rural schools. The CORE partnership involves private sector partners, and 18 public LEAs in northeast Alabama. It includes eight rural LEA's, as defined by Rural and Low-Income Schools (RLIS), with 39 middle and high schools serving more than 11,000 8th-12th grade students annually. Additional rural schools will be added to the study in a second phase. Project-based learning classrooms that are rich with relevancy and related to community, will support rural students to complete high school and attend college. Dual enrollment scholarships and CORE Advisors will bridge high school to college, increasing college enrollment. In addition, ICF International, evaluator for this project, is a leader in rural education research.

Competitive Preference Priority 1- Improving Cost Effectiveness and Productivity

CORE was developed due to the realization that regional universities and PK-12 systems were going through similar issues related to integrating technology and new methodologies in the classroom to support student learning despite decreases in state funding. Therefore, it was imperative that CORE support substantially improving student outcomes without commensurately increasing per-student costs. Partnering with CORE creates efficiency by sharing best practices so teachers and their systems don't have to "recreate the wheel." This project supports teacher networking, sharing of lesson plans and learning objects, and leveraging school system dollars through partnerships with learning management system, curriculum, publishing, technology and other private industry partners. This allows systems to reallocate existing funds to purchase technology and other activities that will sustain change. The CORE model also includes professional development for administrators in developing community-based partners, strategic planning and sustainability planning. A cost analysis of participating school systems will be provided pre and post implementation with cost per student calculations. Each school system involved will create a sustainability plan as part of their strategic planning activities and identify cost-effective practices implemented.

Competitive Preference Priority 2- Broad Adoption of Effective Practices

The CORE model has the capacity to impact education broadly through multiple components that support and sustain system-wide change. By validating the CORE model, with the regional university providing the ecosystem that empowers school systems to leverage partnerships, gain targeted professional development, and network teachers around best practices, it is anticipated that CORE will demonstrate an ability to identify, share and sustain effective practices quickly and with impressive student outcomes. The second phase of the project includes recruiting,

supporting and empowering CORE incubators to replicate the model nation-wide.

Competitive Preference Priority 3- Novice i3 Applicant

Jacksonville State University is a novice i3 applicant.

A. Significance

1. Estimated Project Impact

The Collaborative Regional Education (CORE) Partnership proposes to validate the CORE model for improving student outcomes through comprehensive services that include project-based learning, technology and other student, teacher and administrator services. The goal is to improve college and work readiness among 8th-12th grade students in high need and rural schools.

JSU leads the way as a regional university supporting PK-12 reform through its work with school systems in the Alabama Math, Science and Technology Initiative (AMSTI). A recent evaluation of the effectiveness of AMSTI was conducted by the National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences (Newman, D. et al., 2012). The cluster randomized controlled trial of 4th to 8th grade found the effect on mathematics scores on the Stanford Achievement Test (SAT) was 2.06 scale points. Although the effect on science scores on the SAT for grades 5 and 7 was not statistically significant after one year, there were statistically significant effects on classroom practices and student science scores after two years in science (Newman, D., et al., 2012). **Appendix D** provides references and copies of research reports supporting rigorous evaluation of components comparable to those proposed.

JSU's partnership with Piedmont City Schools (PCS) led to the formation of CORE.

Three years ago JSU and PCS defined its partnership by implementing research-based practices aimed at supporting change throughout the entire system, believing that improving learning in a classroom is good, but whole system change management is necessary for sustainability. As a result, once PSC began their 1 to 1 initiative, JSU and PCS engaged in professional development, including challenge-based learning workshops offered by Apple, Inc.; technology support; learning communities that brought JSU faculty, PCS teachers and administrators around the table to discuss and support new strategies and activities; and change management strategies that ensured administrators were aware of the impact of reform on teachers and staff. PCS's MPower Piedmont Initiative led to national recognition as the #2 *Most Connected High School* by U.S. News and World Report, a charter member of *The League of Innovative Schools*, one of 57 Apple *Distinguished Schools* in the U.S., and nominated for the U.S. Department of Education *Blue Ribbon Schools*.

For more than two years JSU has partnered with a growing number of PK-12 school systems. Currently the 18 public systems represent 72,600, almost 10% of all Alabama public school students, and 27,000 8^{th}-12^{th} grade students. The CORE partnership includes 8 RLIS systems with more than 31,000 students and 11,500 8^{th}-12^{th} grade students.

2. Importance and Magnitude of the Effect Expected

When Jacksonville State University and Piedmont City Schools joined forces to address expanding new methodologies and technologies in the classroom in 2010, the rapid rate of demand and expansion experienced over the past three years could not have been anticipated. By 2011 another school system had joined the partnership and by 2012 there were 16. By 2013 public and private schools were added to the partnership, for a total of 20. The CORE Workshops held in 2012 and 2013 for administrators, technology and curriculum directors

achieved close to 100% representation across the PK-12 partners with approximately 100 attendees at each. The first CORE Academy, held on the campus of JSU in June 2013, boasted attendance of almost 300 teachers and administrators, with plans for 2014's CORE Academy expecting at least 500. Of the 58% of the CORE Academy attendees who responded to an online survey, 91% reported that the CORE Academy met their needs, 90% reported that the technologies and methodologies shared were useful, 91% planned to implement what they learned, and 92% said the 3-day conference met their expectations.

In addition, CORE is about more than professional development for teachers, it includes a model of system-wide change management so teachers and administrators are supported in sustaining the change that leads to increased student learning, graduation rates, and college/work readiness. The CORE model components work together to address the following demands:

Improving Achievement and High School Graduation Rates in Rural Schools

One in four rural students do not graduate from high school and only 17% of adults in rural areas have a college degree (Alliance for Excellent Education, 2010). The evaluators for this project, Howley and Hambic (2011), report that the best way to address low graduation rates is well-prepared teachers holding students to high standards. The CORE partners are aware of the issues facing rural schools in the United States. One of our partners, in fact, recently consolidated two rural high schools in response to the need to increase services at a time when resources were decreasing. Leveraging the budgets of small rural schools will provide for greater efficiencies, as will partnership-building in the community. Rural CORE partner Winterboro High School in Talladega County reports that after implementing technology and PBL in their classrooms, graduation rate increased from 63% in 2009 to 88% in 2013, while college acceptance rates increased from 33% to 79% in the same timeframe. In rural schools, CORE will also support

teachers with implementing place based learning, a variation of project-based learning that holds promise for improving outcomes for rural students.

Innovations that Support College and Work Readiness

The Framework for 21st Century Learning, developed by the Partnership for 21st Century Skills (2007), identified four sets of student learning outcomes for teaching and learning in the 21st century: 1) Life and Career Skills; 2) Learning and Innovation Skills- 4Cs; 3) Core Subjects- 3Rs; and 4) Information, Media, and Technology Skills. While just one component of the framework, the 4Cs - critical thinking, communication, collaboration, and creativity - are identified as critical to the success of a student in both their work and personal life in the 21st century. A pre- post-comparison by CORE teachers implementing CALM, the CORE Active Learning Model of project-based learning, included 70 students assessed on the *CORE 21st Century Skills Rubric*. A paired-samples t-test found significant gains in technology use, critical thinking, problem-solving and overall classroom success in one semester (Simmons, 2013).

A second aspect to college readiness is addressed by dual enrollment and transition services to college. Among the promising studied strategies that support student readiness for college is dual enrollment (Bill and Melinda Gates, 2011; Barnett & Stamm, 2010; Berber & Cole, 2009; Carenevale & Rose, 2011, Edmunds, 2010; Karp, 2007; Michalowski, 2007; Speroni, 2011). JSU freshmen who have taken at least one dual enrollment course have increased retention (Simmons, 2012). The CORE model addresses all of these recommendations in the discussion of CORE components.

Technology

The CORE technology initiative builds on the work of others. Several states, including Maine, Indiana, Michigan, New Hampshire, Texas and Vermont (Bonifaz & Zucker, 2004) have

implemented technology management solutions referenced by this project. In addition, Piedmont City Schools (PCS), a member of the 21st Century Classroom Collaborative, initiated a one to one laptop program in grades 4-12 for which they learned lessons to share with this project implementation team. Six other schools systems have started expanding technology in classrooms as well. These systems share findings and experiences during CORE Workshops.

Research related to technology integration is plentiful, although causal studies are scarce. However, several studies documented gains in higher order skills when classrooms were technology rich (Baker, et al., 1994; Penuel, Korbak, Yarnall, & Pacpaco, 2001; Boaler, 1997, 1998; Shepherd, 1998). The most rigorous studies with comparison groups documented the positive effects of one to one technology programs. Schaumburg (2001) concluded that students with laptops had greater gains in technology literacy than the comparison group. Silvernail and Buffington (2009) conducted a randomized controlled trial that compared the impacts of a professional development program that supported teacher improvement in using technology in one to one mathematics classrooms. The study revealed that this type of instruction was effective in creating changes in teacher practice.

CORE validation will bring an increased emphasis on technology by providing laptops and tablets for treatment group teachers and their classrooms. Although some of the CORE partners have engaged in 1:1 initiatives, most of school systems have not.

Costs of Scaling Up

This $12 million project involves services that impact approximately 58,800 students in phases 1 and 2 across five years. The cost per student is $204. The cost of funding regional institutions is significantly less due to low administrative costs. This ensures more funds are being provided to students, teachers and schools with an estimated annual cost of $41 per student. Scaling up to

100,000 students would cost $4.1 million per year, 250,000 students would cost $10.25 million and 500,000 students $20.5 million.

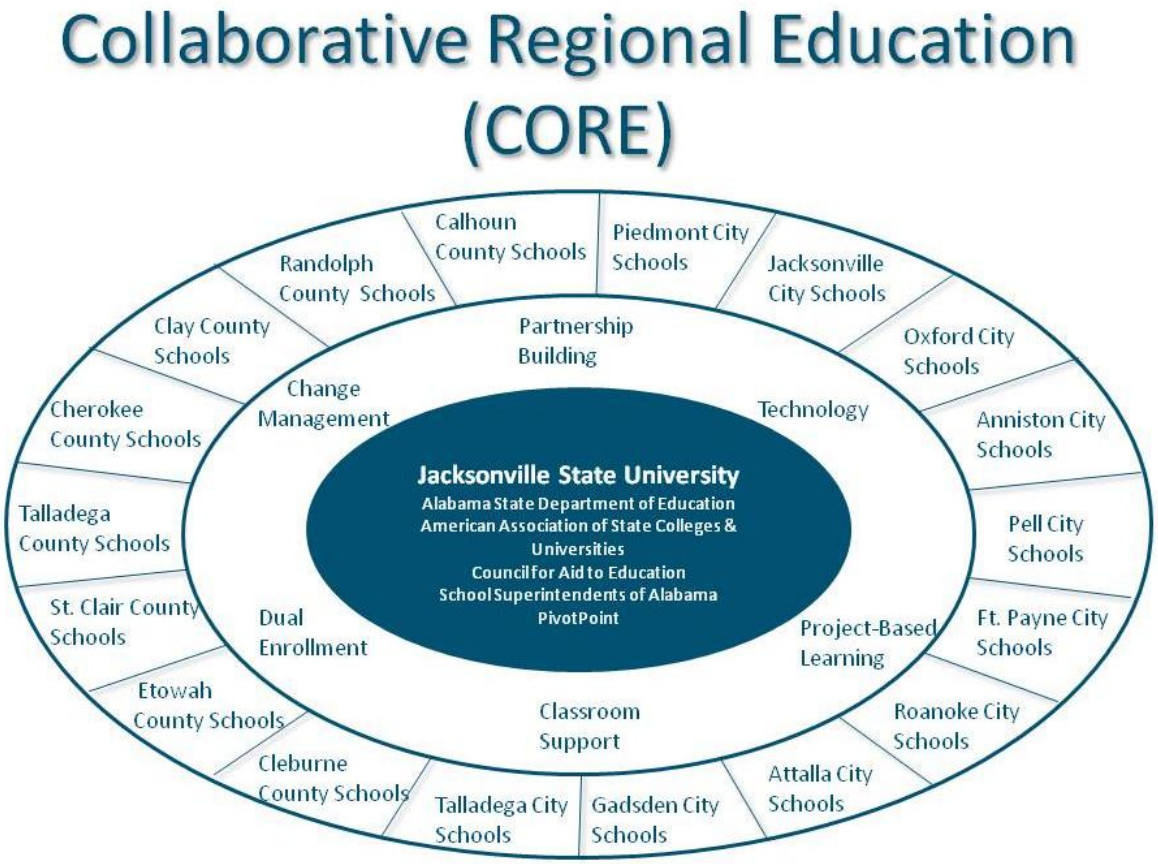
Through this grant JSU will develop materials (**Appendix J**), guides, systems and validated research measures that can be replicated more broadly. JSU plans to make CORE available to all school systems in the State of Alabama and will serve as the national center that will support replication of the CORE model throughout the United States, especially in states that do not have meaningful PK-20 initiatives. JSU will achieve this plan in collaboration with CORE partner, the American Association of State Colleges and Universities with approximately 300 member regional universities and colleges.

Comprehensive Approach

More than 70% of change efforts fail (Kotter, 1996). Change management provides administrators support with identifying and mediating stresses that occur as a result of change. Lezotte and McKee (2002) provide attributes necessary for school system transformation in their book, *Assembly Required: A Continuous School Improvement System*. The attributes schools systems need to demonstrate are: 1) focus on results; 2) simultaneously consider quality and equity; 3) data driven; 4) research-based; 5) collaborative in form; and 6) ongoing and self-renewing. The CORE Partnership supports school systems in acquiring these attributes through six CORE components that through a network of key partners, builds capacity of school systems, teachers and administrators to improve student readiness for college and career. The six CORE components are: 1) partnership-building; 2) technology; 3) project-based learning; 4) teacher support; 5) dual enrollment; and 6) change management. With the regional university at the core of the partnership, local, state and national partners are leveraged to provide supports to member schools in implementing research-based practice and sustaining improvements through

evaluation and change-management. Figure 1 depicts the CORE model, the partners and the primary service components.

Figure 1. The CORE Model



3. The Six CORE Components

This proposal is built around a model made up of integrated components supported by at least moderate evidence of effectiveness. In the section below, this evidence and other research is referenced in support of the CORE model components.

Partnership-Building- CORE begins with partnership-building. It is the belief of all involved that working together is more likely to result in positive outcomes. Dwindling resources ensure that it is not cost-beneficial for school systems to stand alone in their efforts. Newman and

Wehlage (1995) found that external support for setting high standards, providing professional development, and increasing school autonomy were common needs identified in four large school restructuring studies. Partnerships, particularly from the community, help ensure that reforms are sustained (Consortium for Policy Research in Education, 1998).

Technology- In a report on the *Apple Classroom of Tomorrow – Today (ACOT²): Learning in the 21st Century* (2008), a culture of innovation and technology is acknowledged as the fuel that not only drives today's economy, but also is vitally important to student learning and the school environment. Innovative approaches to teaching in the 21st century are necessary to meet the needs and wants of today's student. The media rich, connected lifestyle that students live today has changed the way students expect to be taught, and is very different than just one generation ago.

Several studies support the role of technology in the 21st century classroom (CDW-G 2011 21st-Century Classroom Report, 2011; Penuel, et al., 2001; Honey & Henriquez, 1996), while new electronic tools are replacing textbooks with a digital environment (Desoff, 2010), assessing student learning online (Wu & Chen, 2008), and supporting laboratory e-notebooks (Abari, Pierre & Saliah-Hassane, (2006). Hoffman and McGuire (2010) suggest that four processes: empathy, active learning, interaction among students, and empowerment, remain important in enabling learning in the technology supported classroom.

The Maine Education Policy Research Institute examined the effects of laptop computers used to facilitate science learning in a middle school. The two classroom comparison study found that students in the treatment group who were asked to demonstrate their learning using a laptop, answered more questions correctly on the post-assessment, had higher levels of comprehension and retained knowledge at higher levels (Silvernail, et al., 2011).

Project-Based Learning Professional Development- Project-based learning (PBL) is grounded

in constructivism (Piaget, 1969; Perkins, 1991), which holds that learning is constructed through interaction with the environment through investigations, conversations and activities that build on current knowledge in individualized ways. PBL is known in several forms and found to be successful in many settings (Thomas, 2000; Udall & Rugen, 1996; Hmelo-Silver, 2007, 2004; Mergendoller, Maxwell and Bellisimio, 2006; Cognition and Technology Group at Vanderbilt University; 1992).

Place-based learning is a variant of project-based learning that will be emphasized in the CORE Academy (a three-day conference) and teacher workshops (one-day) through the CORE Active Learning Model (CALM), another variation of PBL. Rooted in a local area, place-based learning focuses on the unique history, environment, culture, economy, literature, and art relevant to the communities that schools serve. Communities provide the context for learning, students focus on curricula reflecting community needs and interests, and community members serve as resources and partners in teaching and learning (Rural School and Community Trust, 2010). Place-based learning is employed to 1) make instruction more relevant to students' lives, 2) support curriculum standards, 3) leverage community resources when financial resources are limited, and 4) encourage strong school-community relationships (Azano, 2011). It has also shown promise in many rural settings (Gruenewald & Smith, 2008; Haas & Nachtigal, 1998; Shamah & MacTavish, 2009; Smith, 2002; Wigginton, 1985; Loveland, 2003; Emekauwa, 2004; Barnett, 2009; Lieberman & Hoody, 1998).

One of the most important aspects of successful implementation of project-based learning is the knowledge, skills and confidence of teachers (Marx, et al., 1997; Blumenfeld, et al., 1991; Good & Brophy, 1986; White & Smith, 2010). A randomized controlled trial study of 56 schools found that students in the classrooms of the teachers receiving professional development scored

higher on math achievement tests than students in the control group (Silvernail & Buffington, 2011; Silvernail, et al., 2011). Comparable findings were found in the clustered randomized controlled trial among students in the Alabama Math, Science and Technology Initiative (AMSTI) who achieved statistically higher in math in one year and in science in two years than students in control groups (Newman, et al., 2012).

Classroom Support- CORE classroom support includes providing an ecosystem of electronic objects, lessons, and media that teachers can share with each other. It also includes mentoring, online learning communities and teacher preparation. Electronic ecosystems, which are still in development and based on learning management system platforms, will allow teachers across schools, districts and states to collaborate and share learning objects, lesson plans and other teaching strategies that other teachers have developed. JSU is working with two national tech companies to determine next steps for this innovative approach to teacher support.

In addition to knowledge, skills, and resources, teachers need a community of support to sustain their classrooms (Barron, et al., 1998). A body of research suggests that ongoing mentorship after an initial intensive training session helps to ensure that teachers fully adopt the research-based, best practice methods they learned during training and that they make these methods a permanent part of their classroom practice (Kohlmeier, Saye, Mitchell, and Brush, 2011; Saye, Kohlmeier, Mitchell, & Farmer, 2009; Miller and Glover, 2007; Barksdale, Woodley, Page, Bernhardt, Kowlowitz, & Oermann, 2011; McCann, 2011; Poyas & Smith, 2007; Roney & Davies, 2007; Wepner, Bowes, & Serotkin, 2007; Adams, 2010).

In addition to the need for ongoing mentoring after an initial, intensive training period, there is compelling research that indicates a need for well-developed tools, scaffolds, and an overall communication plan to complement the mentorship program, including online

communications (Zubrowski, 2007; Kohlmeier, Saye, Mitchell, and Brush, 2011; Saye, Kohlmeier, Mitchell, and Farmer, 2009; Browne-Ferrigno, 2007; & Klein, 2007).

Teacher preparation is also part of CORE classroom support. JSU's College of Education and Professional Studies has moved toward full year internship placements for student interns. Also, students are being equipped with technology prior to internships to ensure they know how to effectively use technology in the classroom, offering support to their sponsoring teachers. And co-teaching has been introduced to students, sponsoring teachers and school systems as the preferred method of sponsoring emerging teachers in the classroom.

Dual Enrollment- Dual enrollment programs provide college credit courses to high school students either on the college campus, high school campus or less often in another location (Kleiner & Lewis, 2005). Dual enrollment studies, although not plentiful, suggest that dual enrollment is strongly associated with positive outcomes such as going to college, graduating from a four-year university and other positive outcomes (Karp, Calcagno, Hughes, Jeong, & Bailey, 2007; Kim, 2006; Swanson, 2008; Speroni, 2011; Bill and Melinda Gates, 2008).

Jacksonville State University has a history of providing dual enrollment for more than 30 years, both in the JSU classroom and on the high school campus. With more than 300 dual enrollment student enrolled in fall 2013, JSU plans to offer dual enrollment scholarships to 500 10^{th}-12^{th} grade CORE students at selected high schools annually. Across four JSU cohorts of first-time freshmen who took at least one dual enrollment course with JSU while in high school a study found that dual enrollment students were retained the first year of college 17 points higher (85%) than the entire cohort (68%) of first-time freshmen (Simmons, 2012).

Change Management- The primary framework for this change management strategy is based on the administration of the Loss of Effectiveness (LOE) Index, identification of stress areas within

the school system, and mitigation of organizational instability through leadership, professional development and other strategies. The LOE Index, developed by Victoria Grady, is derived from work by Kurt Lewin, John Kotter, Rene Spitz, and John Bowlby (Harvard, 1998; Grady, 2005; Grady & Magda, 2007; Grady & Grady, 2008; Grady, et al., 2009; Grady & Grady, 2011). It was developed and validated to identify behaviors, perceptions, and attitudes predicted to emerge in the individual as a response to change, enabling the organization to identify and track emerging symptoms, and provide them with information that will allow them to react and plan more efficiently as they deal with the impact of the change. This is critical since previous research suggests that a significant number and/or intensity of the symptoms will negatively impact the overall performance of an organization and lead to organizational instability (Grady, 2005).

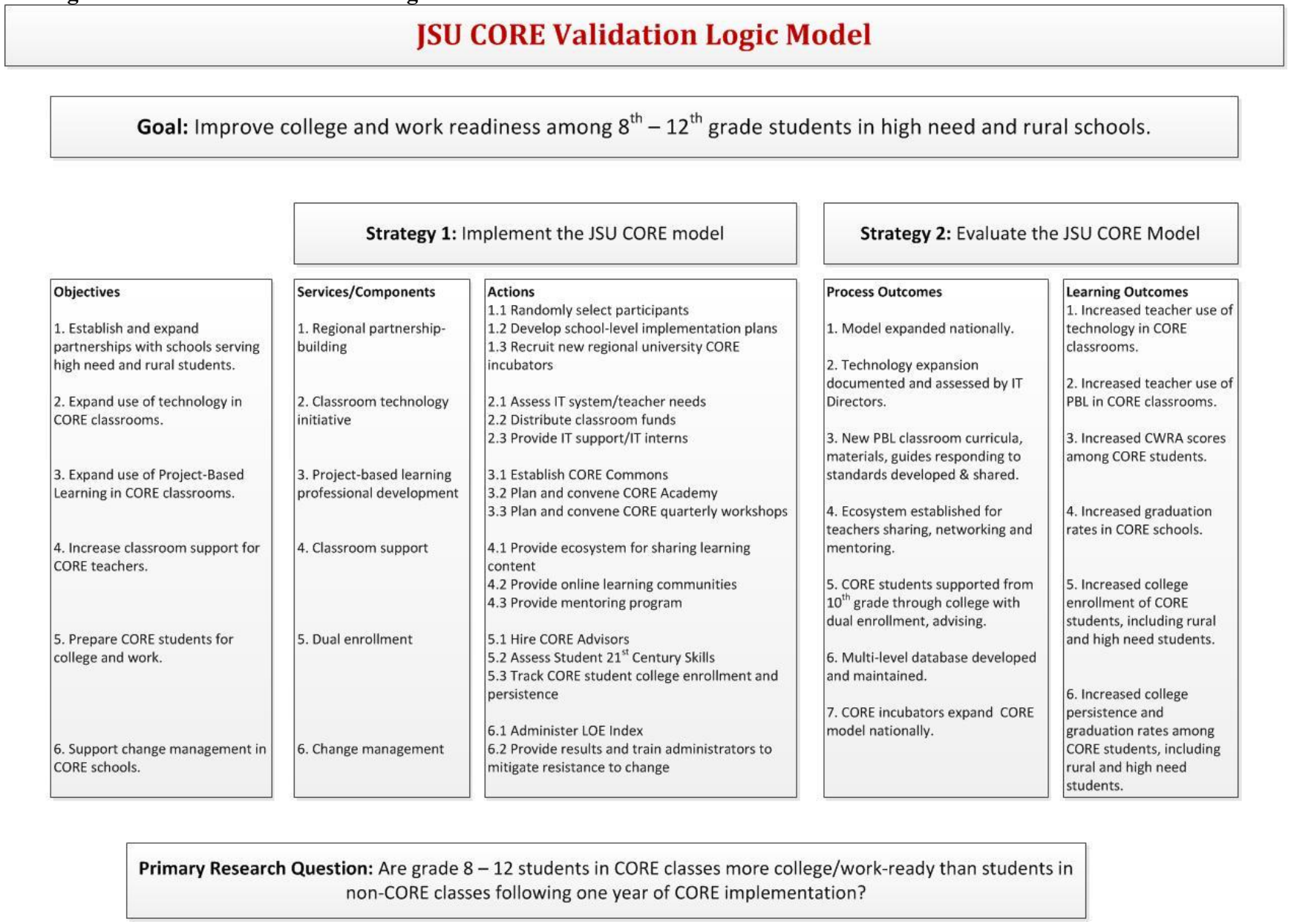
B. Quality of the Project Design

1. Project Plan

CORE's overarching goal to improve college and work readiness among 8th-12th grade students in high need and rural schools, will be supported through six major objectives and corresponding action items that will lead to an ambitious set of process and learning outcomes. Funding for this project will ensure that more school systems in the CORE partnership will have an opportunity to implement strategies supported by CORE. It will support research that systems have not been able to invest in and allow the full comprehensive CORE model to be validated prior to replication. Figure 2 provides the JSU CORE Validation Logic Model.

Objective 1: Establish and expand partnerships with schools serving high need and rural students. JSU is partnering initially with 18 public school systems with 70 middle and high schools available to participate in the first phase of this study if randomly selected. In order to replicate CORE nationally, regional universities with partnering school systems throughout the

Figure 2. JSU CORE Validation Logic Model



U.S. will be purposefully recruited for an expansion of the study in Years 3 and 4. In total 39,000 middle and high school students in northeast Alabama and 19,800 students from other schools systems across the country will participate in this study, totaling at least 58,800 students.

The schools randomly selected to participate in the treatment group will fully participate in CORE and all of its components. The model is built around the regional university and its ability to work closely with PK-12 school systems due to its role in preparing teachers and administrators for the workplace. Regional universities have vast resources that can support schools with a wide variety of needs, as discussed throughout this proposal. It is a natural fit that has been explored through statewide K-20 initiatives, but there are unique characteristics of the CORE model that make it more comprehensive and relationship-driven. First, it includes faculty and PK-12 teachers both leading and attending professional development opportunities. Second, it requires input from the school systems during the planning phase to ensure the intervention is consistent with the school's needs. In fact, all aspects of the program are based on input from superintendents as a result of previous meetings and collaborative efforts. Third, it is focused on increasing the expectations of high need and rural students by providing linkages to college and solutions to the digital divide. Finally, the CORE model is inclusive of communities and partners that will be able to sustain the funding and supports so schools will continue to prepare students for college and work. It is believed that this model will prove successful through the proposed expansion and will lead to improved student outcomes.

Upon award and random selection of participating schools and teachers, the CORE management team will meet with chosen school administrators to discuss technology needs, review current strategic plans and develop new plans for CORE implementation. Building relationships with the system and school administrators is vital to the success of this project.

Classroom funding for hardware, classroom support and technology will be provided to selected schools so they can begin procuring needed items.

Control schools will participate in system, school and classroom level data collection. Incentives, including teacher laptops and classroom supply budgets will be provided to all control group classroom teachers.

Expansion: The second phase schools will be recruited in collaboration with the American Association of State Colleges and Universities (AASCU) during the first year's winter and summer conferences. Year 2, regional university incubators will attend AASCU sponsored workshops to assist them in preparing for implementing CORE and securing PK-12 partners. After random selection of classrooms, the CORE incubators will begin providing professional development and other services in Years 3 and 4, concluding services the first months of Year 5.

Objective 2: Expand use of technology in CORE classrooms.

Technology support will include the purchase and dissemination of funds for laptop computers for teachers and 25 tablets for classrooms. JSU student interns with educational technology interests will be assigned to assist schools with hardware and software management. The 20 IT student interns will attend a workshop developed by the Assistant Director with assistance from JSU's Vice President for IT and others. This workshop will prepare them for the needs of the school system they are assigned to support.

CORE Workshops will also provide lessons learned and technical assistance to school IT directors to help identify needed technology to support wireless classrooms. The CORE Academy also includes workshops that focus on high school technology including access points, switches, cabling and bandwidth requirements in addition to software and apps available that support classroom objectives. Technology firms including Apple, Dell, Blackboard, Canvas,

Desire to Learn and other technology providers sponsor the CORE Academy and provide sessions that support technology integration in the system infrastructure and in the classroom.

Objective 3: Expand use of Project-Based Learning in CORE classrooms.

Learning is the key to change (Senge,1990) and professional development is key to the CORE model. Professional development planning will be initiated by the CORE Executive Team (made up of key JSU and school system collaborators) and implemented through a series of conference management, curriculum-focused teams.

CORE Academy: JSU will convene a three-day CORE Academy each year to provide CORE teachers with discipline-specific professional development. JSU faculty from education, science, history, math and English, who are experienced with using project-based learning, will develop discipline-specific workshops through support from the Faculty Commons. In addition, a core curriculum for teacher certification will be fine tuned, including intensive workshops on 1. Project-based learning (CALM, King, Christopher, & Simmons, 2013), 2. Instructional design, 3. Technology use, 4. Using available learning objects, 5. Creating e-books and learning objects; 6. Assessment, and 7. Subject-based strategies.

Nationally prominent speakers, like Dr. Mark Milliron (2013), are another important component of the CORE Academy. JSU's partners, including Pivot Point and Council for Aid to Education will provide assessment sessions that train teachers and school officials to accurately administer the LOE Index and CWRA+ and interpret the results for formative and summative purposes. The School Superintendents of Alabama and Alabama State Department of Education will participate in the CORE Academy providing sessions on state activities, updates on the statewide initiatives. As in 2013, the CORE Academy will feature the CORE app, used in place

of paper programs, as an interactive technology-based solution to find out about sessions, presenters, venues, attendees and to create a personalized schedule. More than 98% of CORE Academy attendees were satisfied with the CORE app.

Quarterly Workshops: Four professional development workshops will be offered throughout the school year at JSU. Funds to pay for substitute teachers will be provided. Workshop topics will reinforce summer institute professional development and require teachers to share lesson plans for networking and verification of implementation of the CORE curriculum. Workshops may include partner institutions, like St. Cloud State University and Iowa State University, who recently provided sessions at JSU on co-teaching and algebra remediation. Workshops will immerse teachers in project-based learning and technology to support classroom replication.

In addition to teacher professional development, superintendents and principals will be provided strategies to develop meaningful strategic plans, form collaborative relationships with the private sector and their communities and to develop sustainability plans. Information technology directors will attend sessions led by JSU IT professionals, technology in motion staff, vendors, and school system professionals who have already implemented technology.

Objective 4: Increase classroom support for CORE Teachers

Online support and technical assistance will be coordinated through JSU's Faculty Commons. The CORE assistant director will coordinate overall service delivery to schools and will develop a certification program for teachers completing the program. The Commons will coordinate requested classroom and school support for this project including services provided by JSU's Center for Economic Development, Career Services, and IT.

The Institute for Research and Collaboration will coordinate integration of the CORE ecosystem that will allow teachers to network and share learning objects, lessons and strategies

online. JSU education students will be available for year-long internships and will be prepared for supporting project-based learning, technology, learning management systems, co-teaching and assessment in any classroom they enter.

Goal 5: Prepare students for college and work.

In a study supported by the Gates Foundation, the Council for Aid to Education found that performance-based instruction is as good or better at preparing students to succeed in the first year of college (Steedle, et al, 2013). CORE will better prepare students for college and employment by increasing 21st century skills in technology and PBL rich classrooms. Assessment of 21st century skills will take place three times a year through administration of the *CWRA+* and the *CORE 21st Century Skills Rubric*.

Another opportunity for preparation for college is the availability of dual enrollment scholarships. Dual enrollment (DE) will allow first-generation and low-income students to experience college prior to finishing high school. This experience has been shown to increase positive student outcomes at all ACT levels at JSU (Simmons, 2012). Both onsite and online classes will be available through dual enrollment, giving students the opportunity to expand their online skills and access a university campus remotely. JSU will expand its capacity to support 500 additional dual enrollment students annually in two ways. First, faculty will be supported to created additional challenging DE courses by the Faculty Commons. Second, JSU will hire three CORE advisors. Reporting to the Director of Advising, together they will support a seamless support system for dual enrollment students from high school through orientation and if chosen, admission to JSU. The CORE advisors will use Degree Compass, a predictive analytics program that will ensure students take needed courses and know how likely they are to succeed in that course. They will also administer the Learning and Study Strategies Inventory (LASSI) to DE

students to provide diagnostic information related to student study skills necessary for college success. The information from Degree Compass and LASSI will help advisor/student meaningful discussions about majors and career choices. This approach is consistent with Tinto's (2012) framework for student success: expectations, support, assessment/feedback and involvement.

Objective 6: Support change management in CORE School Systems.

In order for teacher changes in practice to be sustainable, whole-system strategies must be engaged that support classroom change. Through the CORE Academy and workshops, administrators will be engaged to focus on strategic planning, private industry partnerships, and sustainability. The School Superintendents of Alabama will assist in providing this training.

School system financial data will be collected at project onset and tracked annually to determine costs per student, state allocations and impact of partnerships. Strategic plan results will be collected annually to determine successful implementation and the impact of CORE on increasing student outcomes given funding challenges.

2. Barriers to Scaling

Failure of change initiatives- Since more than 70% of change initiatives fail, the CORE model seeks to ensure sustainable change, worthy of scaling, with a comprehensive approach that focuses on change management. The CORE components are designed to support system-wide change on three levels: the system, the teacher/classroom and the student. As seen in figure 3, the six components are interdependent and inclusive of all six of the CORE components.

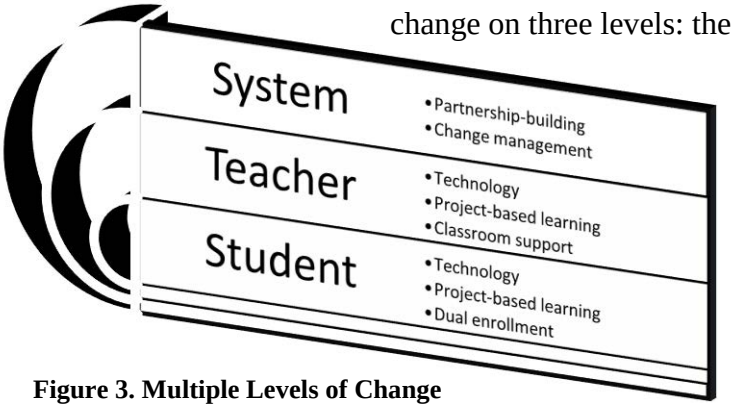


Figure 3. Multiple Levels of Change

Using Kotter's 8 change process (1996), the system will engage in partnership-building and change management, while teachers and students engage in technology and PBL in the classroom. Teachers will be supported by different methods of classroom support, and students in 10^{th}-12^{th} grades will be better prepared for college through dual enrollment.

Sustainability- The network of partners that the CORE model represents are all committed to sustainability of the activities and focus of the proposed grant. These partners include the American Association of State Colleges and Universities (AASCU), the Council for Aid to Education, PivotPoint, the Alabama State Department of Education, the School Superintendents of Alabama, and the 18 school districts represented in this collaborative.

The commitment of JSU to CORE cannot be overstated. Recently, JSU redefined its vision and mission to learning-centered. Supported by the 2011-16 Strategic Plan, JSU's commitment to student engagement and academic success provides faculty the opportunity to lead in classroom innovation using new methodologies and technologies that better meet student needs. As a result, CORE has become part of the university's new culture with senior administrators, faculty and staff committed to its continuation. JSU is committed to providing scholarships to students for dual enrollment after the grant ends and will fund some positions before grant funding and continue to support new positions after the five year grant period.

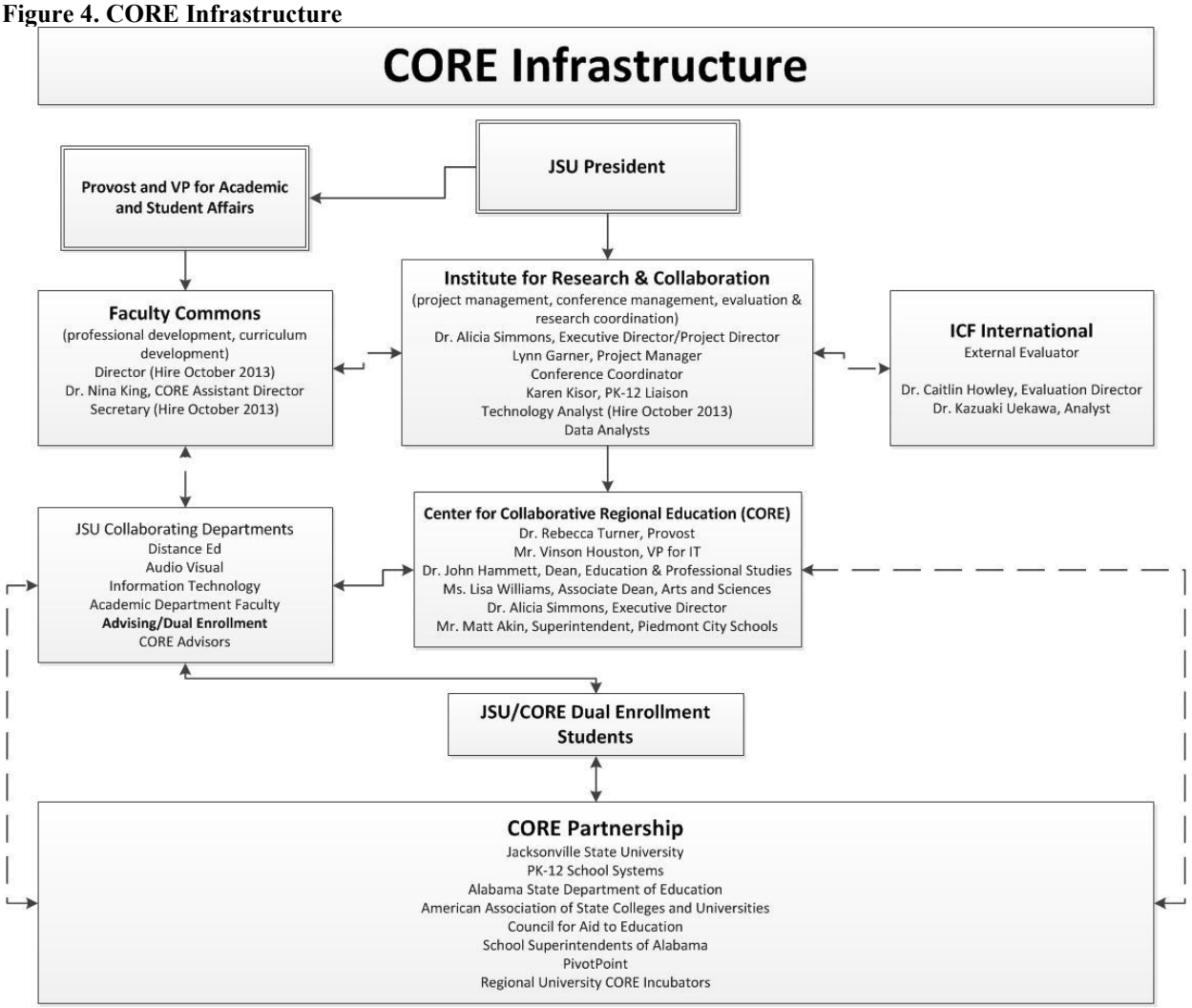
C. Quality of the Management Plan

1. Adequacy of the Management Plan

The proposed management plan includes teams of staff and partners to support service delivery, coordination and communication. Currently directed by Dr. Simmons, JSU developed and implemented CORE with no new funding. The senior administrators of the Center for Collaborative Regional Education provide direction and funding for CORE. The IRC Project

Manager oversees the logistics of workshops and conferences. JSU coordinating departments work together, across silos, to implement conferences, coordinate with PK-12 partners and provide professional development. The Faculty Commons will provide additional support for JSU faculty to develop CORE curriculum and provide classroom support for teachers. The lateral team approach and dedication of JSU staff time over the past 3 years came out of commitment to the concept and continued validation from partners that CORE is needed in northeast Alabama and beyond. Figure 4 illustrates the team approach to this project, which also adds to the sustainability long term and the capacity for other regional universities to replicate the model.

Figure 4. CORE Infrastructure



A project plan organized by the project objectives is provided in **Appendix J**. The plan includes tasks, due dates and responsible parties for the five years of the funded project. The CORE management team, including the evaluators, will meet twice annually to review the project plan, formative data, and results from the fidelity of implementation study. Updates to the management plan will be made annually as needed. The goal for the management team is 100% compliance with the project timeframes as presented, but changes will be made on a continuous basis based on data, team member concerns and feedback from CORE partners. The Project Director will be responsible for ensuring communication between teams is constant, accurate and leads to increased efficiency. For example, CORE team meetings will occur on the Friday after the January CORE workshop and the Friday after the CORE Academy, the first week of June. This will ensure project team members experience CORE professional development, are available to present findings, and can be present in face-to-fact team meetings.

2. Capacity to Bring the Project to Scale on a National Level

Both the Project Director and Evaluation Director have extensive experience on the national-level, working with U.S. government agencies to carry out state, regional and national initiatives. Additionally, partnerships with state, regional and national partners will propel this project into further expansion. The American Association of State Colleges and Universities (AASCU) is committed to providing national conferences, promoting regional university partnerships with PK-12 schools to expand supports and improve educational outcomes for students nation-wide. JSU has presented the evolution of CORE twice a year at the AASCU Academic Affairs conference since 2010. Therefore, other regional universities are familiar with the model and with JSU's efforts. Finally, the CORE model relies on services and resources already available at

regional universities. Therefore, a redefinition of role within current structures allows for a cost effective mechanism to create true PK-20 partnerships that are grassroots in nature vs. mandated.

D. Personnel

1. Staffing Plan

Most of the proposed management team is already in place and functioning in the role proposed. These positions include the Project Director, Assistant Director, Project Manager, K-12 Liaison, Center for Collaborative Regional Education co-Directors, and other university staff members who support CORE workshops and the CORE Academy. The Faculty Commons Director, Secretary and Technology Analyst will be hired in October 2013 based on current allocations by JSU for FY 2014. Upon funding the following staff positions will be hired: conference coordinator, who will report to the IRC Project Manager; the three CORE Advisors, who will report to the Advising Services Director. The IRC and Faculty Commons will work together to achieve the requirements for CORE. The Faculty Commons Director will report to the Provost, who is part of the CORE Executive Team and supports CORE through funding, presence and vision. Current JSU collaborating partners, including information technology, distance education, advising, and academic departments will continue to work together to support CORE.

2. Qualifications and Responsibilities of Key Personnel

Dr. Alicia Simmons will serve as **Project Director** providing overall leadership for the project. Her experience in overseeing large, complex projects is extensive and includes management of multi-year, multi-million dollar contracts with Federal clients. She will coordinate the overall efforts of all project teams, ensuring objectives are met according to the Project Timeline of Activities presented in **Appendix J**. Dr. Simmons has been coordinating the activities of CORE since 2010 and is largely responsible for the development of the multi-faceted partnership. She

works closely with all national and state partners to leverage technology and services for CORE school systems. She will work closely with AASCU to recruit CORE incubators and support them in replicating the model. She also will lead the Center for Collaborative Regional Education/CORE Executive Team, including **JSU's Provost**, **Vice President for Information Technology** and **deans** from education and arts and sciences to continue support for this project. Dr. Simmons will coordinate research and evaluation planning with ICF and will supervise JSU's technology analyst, who will maintain database structure, website and other projects.

Dr. Nina King, Assistant Project Director has also been working on CORE from its inception. An Associate Professor for the College of Education and Professional Studies at Jacksonville State University, she is a favorite instructor both in the classroom and at the CORE Academy. She co-authored the CORE Active Learning Model (CALM) with Gena Christopher, JSU English instructor, and Dr. Alicia Simmons as a version of project-based learning (**Appendix J**). She will develop new classroom supports and mentoring programs for teachers, empowering them to sustain teacher support through online learning communities. She will also work closely with the **Faculty Commons Director**, who will collaborate with faculty and instructional designers to sharpen and develop new workshop curricula, materials (**Appendix J**) and guidelines for CORE replication. The Faculty Commons Director will be hired in October 2013 and have experience in technology, PBL, leading reform, and teaching in both secondary and college classrooms.

Lynn Garner is Project Manager for the Institute for Research and Collaboration (IRC) and has been managing the logistics for CORE workshops and the CORE Academy. She developed relationships with PK-12 school systems and will support the assessment of school system needs. She will support the Director with project reporting requirements and publish progress on the

CORE website (www.corepartners.org) and IRC facebook page. She will also supervise the **CORE conference coordinator**, who will possess 3-5 year conference management experience, who will support workshop and conference logistics. Garner will supervise the **PK-12 Liaison**, who has 30 years experience in CORE partner school systems.

Dr. Caitlin Howley, Evaluation Director- Dr. Howley has over 15 years of experience leading rigorous education research and program evaluation studies, including studies that focus on rural schools. She will ensure all assessment data is gathered, analyzed and reported.

Dr. Kaz Uekawa, Analyst- Dr. Uekawa is an experimental design expert, reviewing educational intervention literature for What works Clearinghouse (WWC) project. A SAS programmer, Dr. Uekawa will analyze data according to the evaluation plan and report findings for presentation to broad audiences. Full bios and CVs/resumes can be found in **Appendix F and J**.

E. Quality of the Project Evaluation

1. Overview of Evaluation Design

Independent evaluation of CORE will be conducted by ICF International (ICF), which has provided research and evaluation services to a wide variety of clients since 1969. The ICF evaluation team has extensive experience conducting objective, comprehensive program evaluations and has led numerous large scale research and evaluation efforts, such as randomized control trials (RCTs) of Odyssey Math and Communities in Schools. ICF has been a subcontractor to the What Works Clearinghouse since its establishment, leading syntheses of rigorous research on a variety of topics, and facilitates the Regional Educational Laboratory Mid-Atlantic.

The evaluation design will assess both implementation fidelity and impact of CORE. The implementation study will examine how closely CORE elements are implemented in training and classrooms as specified in the logic model. The impact study, which will utilize an RCT design,

will estimate the effect of CORE on student college and career readiness.

2. Fidelity of Implementation Study

Table 1 summarizes proposed research questions for the implementation study, along with associated data collection and analysis procedures.

Table 1. Fidelity of Implementation Study Research Plan

Questions	Logic model						Data source(s)	Administration timeline	Analytic approach
	1	2	3	4	5	6			
1. Are treatment group teachers receiving professional development as prescribed by the CORE program?	x	x	x	x			Training logs; topics addressed, time on instructional methods, etc.	Collected at CORE workshops and CORE Academy	Descriptive statistics; thematic analysis
2. Are CORE teachers implementing classroom technology as prescribed by the CORE program?		x					Staff interviews; classroom observations; *CORE Scales*	Collected from both treatment and comparison teachers	Descriptive statistics; thematic analysis
3. Are CORE trained teachers implementing the CORE project-based learning approach as trained in the training sessions?			x				*The 21st Century Classroom Scale*; lesson plans; staff interviews and classroom observations	3 lesson plans collected from tx and comparison group teachers (3x year)	Descriptive statistics; thematic analysis
4. Are CORE teachers receiving quality mentoring supports?				x			Site visit (staff interviews)	Site visits, 8 schools annually during the spring semester.	Thematic analysis
5. Are students taught in CORE classrooms registering for the dual enrollment program?					x		Administrative data	Fall and Spring semesters	Descriptive statistics
6. Is change management implemented as prescribed by CORE?						x	Site visit (staff interviews); strategic and sustainability plans; *LOE Index*	End of academic year	Descriptive statistics

To monitor implementation, ICF will collect both primary and extant data, as follows.

Training logs, to be completed by CORE Workshop and CORE Academy workshop facilitators and Assistant Director (classroom support), following each session to document topics addressed, time devoted to instructional methods, and other relevant details.

The CORE Scales: The *CORE Teacher Methodology Scale* will be administered online to teachers in treatment and control classrooms using 32-items to assess teacher self-efficacy, comfort with methodologies and technologies, and the presence of other training initiatives the teacher has engaged in. The *CORE Technology Implementation Scale*, based on the SAMR

Model of Technology Integration by Ruben R. Puentedura (2013), the 44-item scale assesses the tendencies of teachers to use technology as replacement or transformative tools in the classroom.

Lesson plan review: Evaluators will solicit three lesson plans and associated materials from treatment teachers prior to each workshop in November, January, and April. Lesson plans will also be collected from control group teachers at the same time to facilitate comparison.

Staff interviews and classroom observations: Another strategy for examining implementation will be annual *site visits* at selected CORE and non-CORE schools. In the first year of Phase I and II, ICF will select eight sites randomly. In both year two phases, evaluators will select four low-performing and four high-performing sites based on CWRA+ scores to investigate any implementation differences. Data collection will include semi-structured in-depth interviews with administrators and teachers; focus groups with students to examine their instructional experiences, perspectives on their learning and college/career readiness, and suggestions for improvement; and structured observations of CORE and non-CORE classrooms using *The CORE 21st Century Skills Rubric* (which includes measures for critical thinking, problem-solving, communication, group work and technology use) to assess the extent to which teachers use active learning instructional techniques and integrate technology.

Loss of Effectiveness (LOE) Index*:* To investigate how school systems are reacting to change associated with CORE, the psychometrically validated *LOE Index* (Grady, et al., 2009) will be administered online to school system personnel every April.

Data from the five sources will be shared just-in-time with project staff, and explored during twice-annual team meetings to inform program course correction and decision making. To analyze the resultant implementation data, ICF will conduct and interpret descriptive statistical analyses (e.g., frequencies, proportions, means, standard deviations, etc.) of

quantitative data. Evaluators will also conduct *t*-tests to compare means of the treatment and comparison group samples. Qualitative implementation data—including training logs, lesson plans, staff interviews, and classroom observations— will be analyzed and interpreted via thematic analysis, wherein data passages will be coded inductively by theme. Results will be shared with CORE staff and used to improve project implementation.

3. Impact Analysis

ICF will also conduct a rigorous RCT of the college/career readiness effects of CORE by randomly assigning schools to implement CORE or to continue with "business as usual" instruction. Focusing on college/career readiness, impact estimates will explore whether students in CORE classes are more prepared for college and careers than those in non-CORE sites following one year of implementation (see Outcome Measures subsection for more information). Such a design will provide the most credible evidence of project impact by eliminating the most serious validity threats (e.g., non-equivalence of groups, etc.).

In Phase I, randomization of the 70 high schools in the 18 participating districts will be conducted within four categories based on a combination of (a) school locale (rural vs. nonrural) and (b) CORE implementation level (new users vs. those already implementing some component of the program). The evaluation team will determine the number of schools to sample from each block based on the distribution of the schools in the 18 systems. This will allow estimation within each category as well as across the entire sample. Because control schools will continue employing other instructional approaches, the proposed investigation will compare the effects of CORE to a combined group of other instructional techniques. In Phase II, the project will recruit the same number of teachers and students from additional schools across the nation.

The impact component of the proposed evaluation will pose one confirmatory research question, and address other questions as exploratory to limit the likelihood that spurious significance will be identified via multiple hypothesis testing. Research questions and associated data collection and analysis details are summarized below in Table 2.

Table 2. Impact Analysis Plan

Confirmatory Research Questions	**Logic model component(s)**	**Data source(s)**	**Administration timeline**	**Analytic approach**
Are Grade 8-12 students in CORE classes more college/career-ready than students in non-CORE classes following one year of CORE implementation?	Learning outcome 4	*CWRA+*	Pretest at semester start Posttest at semester end	Hierarchical linear modeling with covariates (HLM)
1. Are Grade 8-12 students in CORE classes more college/career-ready than students in non-CORE classes following one semester of CORE implementation?	Learning outcome 4	*CWRA+*	Pretest in Sept; Midtest in Dec; Posttest in April	HLM
2. Are CORE teachers more effective in improving growth in CWRA+ scores as they teach more semesters?	Learning outcome 4	*CWRA+*	Pretest in Sept; Midtest in Dec; Posttest in April	HLM, with data from multiple semesters
3. Are there outcome differentials between significant student subgroups (based on grade-levels, gender, free/reduced lunch status as a proxy measure of poverty, achievement level, race, ethnicity, disability status, language proficiency, dual enrollment) in CORE and non-CORE classes following one year of CORE implementation?	Learning outcome 4	*CWRA*;+ administrative data	Pretest in Sept; Midtest in Dec; Posttest in April	HLM, with interaction terms
4. Do students in CORE classrooms exhibit higher levels of academic engagement and efficacy, and willingness to invest time and effort to school work?	Process outcome 5	Student survey; *21st Century Skills Rubric*	Posttest at semester end	HLM
5. Are students in CORE classrooms more successful with outcomes such as attendance, retention, college enrollment, college persistence?	Learning outcome 5	State and nat'l student databases	Data retrieval, made after each college semester	HLM; multilevel log regression
6. Are teachers in CORE classrooms more self-efficacious in regards to, more knowledgeable about, and more likely to use technology-integrated instructional methods and PBL than teachers in non-CORE classrooms?	Objective 2&3; learning outcomes 1&2	Scales and Rubric	Posttest at school year end	Ordinary least squares reg, with teachers as the unit of analysis.
7. Do teachers in CORE classrooms receive more support for learning than teachers in non-CORE classrooms?	Objective 5	Scales	Posttest at school year end	ANOVA, with teachers as the unit of analysis

As described in the implementation fidelity study section, the ICF team will administer the *CORE Teacher Methodology Scale* and the *CORE Technology Implementation Scale* to teachers

and conduct observations using *the 21st Century Skills Rubric.* Student data will be collected via:

The College and Work Readiness Assessment+ (CWRA+): The overall goal of the CORE program is to train teachers with the instructional use of technology and PBL, so they can help students grow in college and work readiness. The *CWRA+* measures students' competency in critical thinking, analytic reasoning, and problem solving and written communication skills; such skills sets have been found necessary in college and work environments. To measure the college/career readiness of comparison and treatment subjects, ICF will analyze the *CWRA+* data collected for Grades 8-12 in September, December and April for two years each for Phase I and II. Evaluators will target all students taught by both CORE and non-CORE teachers. This will allow the team growth over the course of each semester and each year. The *CWRA+* will be administered in collaboration with the Council for Aid to Education.

***High school and college enrollment and persistence*:** To explore other, more distal, outcomes, ICF will obtain school-level data on attendance, college enrollment, persistence, and graduation data from JSU, ACHE, and the National Student Clearinghouse, each semester to track persistence rates. This component of the study will focus on the first and the second cohorts from Phase I as they complete their potential second and third years of college by the end of Year 5.

***Student surveys*:** The evaluators propose to administer student surveys at the beginning and close of each school year to investigate how CORE is associated with student engagement in learning, sense of self-efficacy, efficacy with technology, and devotion of time/effort to school work as intermediate outcomes. Teachers will complete the *21st Century Skills Rubric* three times a year (September, December and April) to document evaluation of student skill attainment.

To address the primary confirmatory research question, evaluators will conduct a

multivariate statistical comparison of CORE and control group students' test scores collected at the end of school year and derive the impact coefficient[1]. The proposed hierarchical linear modeling framework (HLM) (Raudenbush & Bryk, 2002), wherein students are nested within classrooms within teachers/schools, will explicitly model the structure of the data and adjust for between-teacher/school clustering effects. The impact coefficient will be adjusted for pretest scores collected at the beginning of the school year, as well as other covariates. Additional information about the analytic model is available in **Appendix J**. The evaluation team will include covariates in the model to improve precision of estimates, including free/reduced lunch eligibility as a proxy measure of poverty, special education status, and previous achievement, among others, as indicated by significant predictors from previous research. Baseline equivalence of treatment and control groups will also be examined before impact analyses begin. This model will be applied separately to different samples defined by core subject matter (Science, Math, English, History).

Power analysis was conducted to assess whether the proposed design can produce meaningful levels of minimally detectable effect size (MDES), while retaining statistical power greater than .80. Phase I and II studies have the same parameters and assumptions as follows. The design utilized four blocks based on rural versus non-rural schools, as well as the schools that already used some components of the CORE program and those that were new to the program. The design will include a total of 66 teachers (approximately 16 per block) randomly selected from 70 schools and the alpha level to use for statistical test will be 5%. It is assumed

[1] Since the CWRA will be administered three times during school year, the growth modeling approach utilizing three time points as the dependent variable is technically possible. The model, however, will not adjust for any pretest differences on the independent variable side of the regression equation. The advantage of the growth modeling approach would be to assess the semester-to-semester test score change explicitly. Exploratory question 1 will allow us to examine the semester-based growth in CWRA scores.

that each teacher teaches 6 classes and the number of students per class is 25.

Optimal Design Software (Spybrook, Bloom, Congdon, Hill, Martinez & Raudenbush, 2011) helped produce the simulated relationship between the number of schools and MDES, using the 4-level blocked cluster randomized trial framework. Given findings from a study previously conducted of a similar intervention program, the Alabama Math, Science, and Technology Initiative (AMSTI) (**Appendix D**), ICF assumed that impact size variation between the blocks was non-existent, the variance explained by blocking and school-level predictors (including pretest school-average scores) was, respectively .10 and .50, and between-teacher/ school intraclass correlation (ICC) was .22. To be conservative, the between-classroom ICC was set to .11 (a mid-point value between 0 and the between teacher ICC). The results indicate that the proposed number of students, classes/schools, and blocks will produce a MDES value of 0.20, and that both Phases of the study will be sufficiently powered. Hence, the proposed design will permit the evaluation to detect effect sizes as small as .20, and larger effect sizes easily.

HLM will be applied to address exploratory research questions 1, 2, and 3. Question 1 will assess semester-based growth by using the beginning of semester score as pretest and the end of semester score as the outcome. Question 2 will address whether teachers' experience with CORE promotes student learning. Data from the first, second, third, and fourth semesters will be pooled in the analysis sample, and the model will estimate the student growth differences among CORE teachers with varying levels of CORE teaching experience (1 to 4 semesters) and control group teachers.

In terms of exploratory research question 3, the study team will test the presence of interaction effects between the intervention and subgroup variables, such as grade-levels, ethnicity, disability types, gender, language proficiency levels, and dual enrollment status. For

exploratory question 4, the same impact model will be applied to analyze academic engagement and efficacy variables. The same HLM model will be applied to address the fifth exploratory question to examine student attendance, disciplinary events, retention, and high school graduation outcomes. ICF will compare differences in college enrollment and persistence rates between the treatment and comparison students, using data obtained from the National Student Clearinghouse. For college enrollment outcomes, evaluators will focus on two cohorts of Alabama students who will graduate high school in Year 2 and Year 3 of the project. The first and second cohorts from Phase I will be tracked until they reach the end of, respectively, their potential third and second years in college. To model dichotomous outcomes (e.g., whether students proceed to the next grade level, graduate on time, or enroll in college), a multilevel logistic regression framework will be employed (Raudenbush & Bryk, 2002).

For exploratory question 6, the study team will treat teachers as the unit of analysis and compare the difference between the treatment and comparison group teachers. ICF will examine survey-based teacher outcome measures of professional self-efficacy, knowledge and use of 21st century instructional methodologies. Covariates will include gender, years of teaching, subject area, and degree type. Finally for exploratory question 7, evaluators will conduct analysis of variance to compare the average support levels of the treatment and control group teachers.

References- See Appendix J