eMINTS Validation Project

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eMINTS Validation Project

Competitive Preference Priority Addressed: The project addresses Competitive Preference Priority 8, Innovations that Serve Schools in Rural LEAs. All 60 districts to be served in the project meet requirements under Title I (schoolwide or targeted) or Title II.D (50 percent of students in poverty) and are part of the Small Rural School Achievement (SRSA) program or the Rural and Low-Income School (RLIS) program authorized under Title VI, Part B of the Elementary and Secondary Education Act (ESEA).

Needs of rural Missouri schools: Missouri's rural K–12 student population is nearly one-quarter million students, the 15th largest in the United States. Poverty is high, with 39 percent of Missouri rural students qualifying for Free and Reduced-Price Lunch (FRPL). In 2010, the Institute of Education Sciences (IES) reported that only 19 percent of Missouri students eligible for FRPL attained proficiency or better on the 2009 National Assessment of Education Progress (NAEP) mathematics test. Student mobility in Missouri rural schools ranks in the highest quartile in the United States, with 16 percent of families reporting changing residences in the 15 months prior to being surveyed. Per-pupil expenditure for Missouri rural schools is the 12th lowest in the United States (Johnson & Strange, 2005).

The attributes of many rural communities (i.e., isolation, a low tax base, an aging population, and higher poverty levels) contribute to the scarcity of qualified teachers for rural schools nationally and in Missouri (Monk, 2007). Among the promising practices that rural schools might use to recruit and retain high-quality teachers is improvement of the school's culture and working conditions (McClure & Reeves, 2004). Findings from the eMINTS Validation Project may show rural schools how to improve both student achievement for high-need students and school culture for teachers.

Section A: Need for the Project and Quality of the Project Design

Project Approach (A1)

Need for programs to support transition to high-quality standards and assessments: Despite years of implementing standards-based accountability systems, many teachers today lack the necessary preparation to develop standards-based instructional strategies and to inform these decisions utilizing student assessments (Drake, 2007). Standards-based instruction necessitates the application of a new skill set for most, and Drake contends that "often the challenge is not in the standards themselves but in our assumptions about how to work with them" (p. 3).

Missouri is among 48 states committed to the Common Core State Standards Initiative (CCSSI). The need to validate programs that assure states of effective ways to teach teachers to develop and use standards-based instruction and assessments is acute. Research suggests that the reform approach can be effective in transferring knowledge gained in professional development (PD) to practice (Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). The ***enhancing Missouri's Instructional Networked Teaching Strategies*** **(eMINTS)** National Center professional development (PD) uses a reform approach providing teachers with the support needed to comprehend and use standards-based instruction and assessment. eMINTS has successfully trained thousands of teachers in nine states (Alabama, Arkansas, Delaware, Illinois, New Jersey, Nevada, Maine, Missouri, and Utah) and Australia, each utilizing different state standards. The eMINTS Validation Project will study eMINTS' PD's effectiveness in helping teachers translate standards and information from assessments into classroom practices to meet the needs of all students and may thus inform practice in all states.

Needs of middle school students: Middle school (typically Grades 6–8) is a time of transition for students, who experience dramatic physical, psychological, and intellectual

development changes. Educators understand the importance of middle school and how careful planning is required to meet students' unique needs (National Middle School Association, 1995).

Middle school is a critical time for students to develop the knowledge and skills they will need to achieve college and career readiness. Olson (2006) found that the reading and mathematics skills needed for success in the workplace are comparable to those needed for success in the first year of college. Unfortunately, middle school is also the period in which students may begin to lag in academic performance. Lembke and Gonzales (2006) reported that the performance of United States middle school students is lower than that of their peers in other countries, particularly when tested on tasks embedded in real-life context. Tasks of this nature commonly require skills cited by groups such as the Partnership for 21st Century Skills (Bellanca & Brandt, 2010) as being associated with problem solving, collaboration, and use of information technology. The eMINTS Validation Project has the potential to leverage existing technology investments that many districts already have made by corroborating a PD program that can take full advantage of these investments to increase college and career readiness for all students.

eMINTS as an exceptional approach—program description: The eMINTS National Center offers a PD intervention for teams of educators, especially those serving high-need students. eMINTS is a unit at the University of Missouri (UM) and partners with the Missouri Department of Elementary and Secondary Education (DESE) and the Missouri Department of Higher Education (DHE). eMINTS is one of few PD programs with data to support the chain of evidence from delivery of a specific PD program to changing teacher practice and to positive impact on student achievement (Martin, Strother, Beglau, Bates, & Reitzes, in press).

The eMINTS PD interventions generate building wide reform by helping teachers master the translation of any state standards and information from assessments into engaging classroom

practices that employ technology. Teachers learn instructional strategies that utilize standards- and inquiry-based learning, incorporate real-world authentic learning, encourage collaboration, and build community among students and teachers. Technology resources in eMINTS classrooms include a SMART Board (interactive whiteboard), teacher laptop, printer, digital camera, and one computer per two students (a one-to-one ratio is recommended for secondary schools). Software is limited to productivity software. eMINTS PD and the required technology create classrooms that equip students with 21st century college- and career-readiness skills. Since 2003, eMINTS implementations have been funded in high-need districts across Missouri and in other states using Title II.D funds targeting students in schools with high poverty levels.

An eMINTS Instructional Specialist (eIS) whose responsibilities include providing PD and in-classroom coaching to teachers is assigned to each school. eMINTS PD gives teachers more than 250 hours of PD spanning two years and support that includes monthly classroom visits. As part of refining and improving eMINTS PD, eMINTS staff integrated an Intel® Teach Program (Thinking with Technology) recently, adding a third year of PD to help teachers sustain and build on the first two years of eMINTS PD. The third year expands teachers' abilities to use project-based learning, giving them access to Intel's suite of online tools designed to involve students in 21st century higher-order thinking and problem solving. See PD Delivery Timeline in Appendix H for details about sequence and topics included in eMINTS PD and Intel Teach.

Project Goal, Objectives, and Strategy (A2)

Goal: Validate eMINTS PD's effectiveness in helping Missouri's teachers translate standards and information from assessments into classroom practices that meet the needs of all students, including high-need students.

Objective 1: Assess the efficacy of the original two-year eMINTS PD program in increasing the

academic success of seventh- and eighth-grade students in mathematics and English language arts (ELA), particularly students in rural schools with high levels of poverty.

Objective 2: Assess the efficacy of the third year of eMINTS PD using the Intel Teach Program Thinking with Technology (eMINTS+Intel Teach), added to the original two-year eMINTS PD program, in increasing the academic success of seventh- and eighth-grade students in mathematics and ELA, particularly students in rural schools with high levels of poverty.

Objective 3: Assess the effects of eMINTS and eMINTS+Intel Teach on seventh- and eighth-grade students' academic orientation and 21st century skills.

Objective 4: Examine eMINTS outcomes on teachers' practices, including standards- and inquiry-based learning, classroom community, and technology integration practices.

Objective 5: Explore impact variations of eMINTS and eMINTS+Intel Teach across student subgroups (e.g., ethnicity, socioeconomic status, limited English proficiency [LEP], individualized education program [IEP]) and among students exposed to differing amounts of each program (e.g., students whose teachers have had Year 1 of eMINTS PD, Year 1 and Year 2 [eMINTS PD], and all three years [eMINTS+Intel Teach]).

Strategy and plan of action: The strategy and plan of action that eMINTS will employ to meet the project goal and objectives are embodied in the program's design: multiple years of intensive PD with in-classroom coaching supported by a specific set of technology resources. The New Franklin School District (NFSD) is a model rural eMINTS district that will serve as official local education agency (LEA) on the project. NFSD staff will use their experiences with successful eMINTS implementations to mentor project participants and support project tasks.

eMINTS PD is based on four underlying research-based components: *inquiry-based learning, high-quality lesson design, community of learners*, and *technology integration* and

addresses issues identified as barriers in the consistent use of standards-based instruction and technology. eMINTS PD includes coaching to enhance teachers' ability to translate concepts learned about standards-based instruction into classroom practice (Joyce & Showers, 1995).

Inquiry-based instruction has been identified as effective in improving student performance (Brooks, 1993). eMINTS PD illustrates for teachers how marrying standards-based instruction using approved state standards with interdisciplinary *inquiry-based learning* improves student performance. Teachers progress through stages from direct instruction to guided inquiry and finally to open inquiry using technology to skillfully guide students toward content knowledge needed for success on local/state assessments. Authentic assessments help students develop higher-order thinking skills and are critical to developing 21st century learners; however, assessment in standards- and inquiry-based classrooms can be challenging for teachers new to the practice. In eMINTS PD, teachers learn about and practice using multiple types of assessment in sessions dealing with assessment and in content woven throughout the program.

PD focusing on *lesson design* enables teachers to plan standards-based instruction and inform instruction with formative and summative assessments. eMINTS PD guides teachers with lesson design processes created by eMINTS staff and based on the rigorous Japanese design model that researchers suggest improves instruction (Lewis, Perry, & Hurd, 2004).

Students who learn in classrooms where decisions are made collaboratively display more creativity and higher-order thinking (Kohn, 2006). In other analyses, Kohn (1994) cites multiple studies showing higher levels of achievement when students are part of a learning community. eMINTS PD creates a community of practice for teachers teaching them how to establish a *community of learners* in support of standards- and inquiry-based instruction in their classrooms.

Lawless and Pellegrino (2007) argue that introducing teachers to new technologies for

teaching and learning can support change in teaching practices. eMINTS PD centers on a suite of technologies and weaves *technology integration* into the practice of standards- and inquiry-based teaching. Instead of approaching teachers with a need to change their teaching, teacher buy-in for instructional change is facilitated by the addition of technology to the classroom.

Studies have found combining in-classroom coaching and PD to be effective in changing teacher practice (Dickinson, Darrow, & Tinubu, 2009; Koh & Neuman, 2009; Neuman & Cunningham, 2009). eIS are trained using Costa and Garmston's (2002) Cognitive Coaching[SM] methodology to help teachers with lesson planning and reflection on practice. In-classroom coaching is a key strategy that will be used to meet the project goal and objectives.

Supporting Research Evidence (A3)

Strength of eMINTS PD: The backbone of eMINTS' success in changing teacher practice is its innovative PD model. PD has long had potential for teacher improvement; however, researchers have noted potential challenges that may reduce its effectiveness. eMINTS PD is purposefully aligned with best practice research and controls for issues that reduce effectiveness.

Jacob and Lefgren (2004) assert that PD, in general, is a "low-intensity affair that lacks continuity and accountability" (p. 52). PD is often limited in both time and scope, misguided or misaligned from teacher needs, and uncoordinated across training sessions (Jacob & Lefgren, 2004). Such practices may lead to a cycle of adoption and abandonment in schools, further perpetuating high teacher turnover rates. eMINTS counters these conditions by providing high intensity PD (250 contact hours) over several years purposely building community for teachers.

Effective PD involves active learning, a broad range of activities including observing expert teachers, being observed, and planning how new materials and methods will be used in the classroom (Desimone, 2009). eMINTS PD embraces active learning by modeling the

evidence-based teaching strategies teachers learn to implement. They design classroom activities with collegial support. They observe and reflect on the practice of expert eMINTS teachers.

Strength of Intel Teach "Thinking with Technology" PD: Research-based and independently evaluated (Light & Martin, 2007), Intel Teach has a large audience to which it delivers programming, reaching teachers worldwide since 2002. Intel Teach courses such as "Thinking with Technology" enable teachers to introduce, expand, and support inquiry-based approaches in the classroom. Teachers learn how to use teacher and student online resources to create strategies for encouraging classroom collaboration and enhancing critical thinking skills.

Section B: Strength of the Research, Significance of Effect, and Magnitude of Effect

Strength of the research on improving student achievement: Since eMINTS' inception in 1999, annual external evaluations have been conducted to determine the effects of eMINTS PD on teacher and student outcomes. Full text evaluation/research reports can be found at www.emints.org/evaluation/reports/. Qualitative research and formative evaluations also have contributed to a better understanding of the facilitating factors and challenges associated with school/classroom implementation. Section B summarizes 10 years of eMINTS PD research and evaluation, assesses the quality of evidence reported, and offers implications for proposed project implementation and evaluation. *"eMINTS classroom" refers to classrooms where teachers complete the original two-year eMINTS PD program and the required technology is present.*

Student outcomes: eMINTS external program evaluations conducted from 2002–05 used quasi-experimental design comparing performance of students in eMINTS classrooms to students in non-eMINTS classrooms in the same school and grades. Although the authors do not explain how treatment classes were selected, the total number of classes in the evaluations ranged from 25 to more than 100, depending on subject, grade, and year. The number of students

in eMINTS classrooms ranged from 500 to 1,300; the number of students in non-eMINTS classrooms ranged from 700 to 2,500.

These evaluations consistently found that elementary students enrolled in eMINTS classrooms significantly outperformed students enrolled in non-eMINTS classrooms on state standardized performance measures in communication arts (equivalent to English language arts), mathematics, science, and social studies. These results primarily pertained to students in Grade 3 communication arts and science and Grade 4 mathematics and social studies, with small sample sizes suggesting similar results may exist at Grades 5 and 6 (Office of Social and Economic Data Analysis [OSEDA], 2002, 2003a, 2004, 2005). OSEDA analyses were conducted using student achievement data from the Missouri Assessment Program (MAP) to compare the percentage of students attaining proficient and advanced levels of achievement in eMINTS classrooms with the percentage of students reaching those levels in non-eMINTS classrooms. A larger percentage of eMINTS students attained proficiency or advanced levels of achievement than did non-eMINTS students in communication arts from 2002–05 (ranging from 1 percent to 12 percent), the difference being statistically significant at the .05 level from 2003–05. Mathematics results are similar, with the only exception being 2004, when non-eMINTS students had a slightly (0.4 percent) higher proficiency rate. The other three years of mathematics data indicate statistically significant differences in favor of eMINTS students (ranging from 9.2 percent to 9.8 percent).

More recent evaluations by the Education Development Center (EDC) from 2006–09 substantiated OSEDA's findings. EDC's evaluations focused on schools receiving competitive Title II.D awards in Missouri. Except for the first study, the reports evaluated an approximately even distribution of eMINTS students and non-eMINTS students (approximately 6,000 students total per year) across about 40 schools and 10 districts that included NFSD, the project partner

LEA. These reports of a more mature eMINTS PD program extended to Grades 5 and 6, where students in eMINTS classrooms consistently attained higher rates of proficiency or advanced levels in all grades (3–6) in communication arts and mathematics, with significant results at the .01 level in most comparisons, including Grades 5 and 6 (Strother, Martin, & Dechaume, 2006). Turning to mean achievement differences—at either student or classroom level—on the MAP, the 2002 and 2003 reports indicate that students in eMINTS classes consistently outscored their peers in non-eMINTS classes as well as all other Missouri students. In communication arts, eMINTS students had higher mean scores across years, with differences growing larger each year (from less than 1 point to over 10 points) and more statistically significant (not significant to .0001) while producing greater effect sizes (.013 to .173). In mathematics, mean score differential (7–10 points) and effect sizes (approximately .25) remained stable and significant.

For all subjects, the magnitude of the gap between eMINTS and non-eMINTS students by group—those with an IEP, in a Title I school, who qualified for FRPL, or who were a member of a minority group—was statistically significant and grew over time. Effect sizes were consistently larger for some subgroups, especially students qualifying for the FRPL. For example, the OSEDA (2004) analysis of 2003 MAP data reported the following effect sizes: communication arts (.21), mathematics (.19), science (.11), and social studies (.20). Even larger effect sizes were found for student achievement in schoolwide Title I schools: .29, .32, .16, and .25, respectively. These findings were consistent across OSEDA reports. In addition, students with IEPs and LEP students in eMINTS schools outscored their non-eMINTS peers by approximately one standard deviation in each of the four core subjects, and the differences in means were statistically significant at the .001 level (Martin, Strother, Weatherholt, & Dechaume, 2008; Strother, etal, 2006). “The fact that the effects were most dramatic among the

highest-need students suggests that the kind of environments eMINTS teachers create in their classrooms may be particularly effective for these students" (Strother et al., 2006, p. 7).

Analyses of the original two-year eMINTS program indicate that students of second-year eMINTS teachers significantly outscore non-eMINTS students and students with first-year eMINTS teachers (OSEDA, 2003c). Results of perhaps the strongest evaluation yet conducted appear to confirm this. Martin, Strother, and Reitzes, in a 2009 longitudinal analysis of student performance over two years (2007 to 2009) utilizing a matched schools design, found that students assigned to eMINTS classrooms for two consecutive years significantly outperformed students assigned to non-eMINTS classrooms for two consecutive years at Grades 5 and 6 in communication arts ($p < .05$) and mathematics ($p < .001$). In addition, scores of students having two years with eMINTS teachers compared with students having an eMINTS teacher for only one year were significantly greater in communication arts ($p < .01$) and mathematics ($p < .001$) at Grade 6. Moreover, the variance explained by students being enrolled in eMINTS classrooms for two consecutive years was sizeable, especially for mathematics (23.8 percent).

A decade of evaluation on eMINTS consistently has shown promise in changing teachers' practice and raising student achievement. In particular, these results were found to exist among intermediate elementary students (Grades 3–6) representing a range of demographics, in communication arts and mathematics, and in over 40 school districts across Missouri. While these studies show promise, there are inherent limitations in past evaluation designs, which suggest the need for a more rigorous evaluation design to substantiate the program's efficacy. For example, none of the existing evaluations appears to account for the nesting of individuals at the classroom or school levels, which can result in underestimated error values and substantially increase type I error (i.e., the probability of rejecting the null hypothesis when it is true).

Evaluations conducted in 2004, 2005, and 2009 used a quasi-experimental design, comparing the performance of students in eMINTS classes with students in non-eMINTS classes by matching classes within the same school or district. This type of design does not account for unobservable variables that may create unequal groups and lead to selection bias. Evaluations conducted from 2006–08 used a pre-post design with no comparison group. These designs similarly introduce the threat of selection bias and, without a group of similar comparison schools, cannot provide a reasonable estimate of what the results would have been had the program not been implemented.

Further research also is needed to strengthen the program's external validity by exploring its effectiveness in higher grade levels. Most of the evaluation work conducted on eMINTS during the past decade has focused on implementation fidelity and student impacts in elementary schools. Not surprisingly, Martin et al. (2008) note that a logical next step "would be to seek funding for a randomized control trial to measure program impact on students and teachers…a number of evaluations have provided evidence of positive program impact on students, a randomized control trial would provide a stronger, causal case for program impact, should similar results be found" (p. 75). The eMINTS Validation Project intends to expand the existing knowledge base about eMINTS' program effectiveness, especially as eMINTS refines and updates its programs (e.g., adding Intel Teach). Formative evaluation of Intel Teach "Thinking with Technology" (Culp, Pasnik, Wexler, & Meade, 2005) found substantial evidence that teachers do translate Intel Teach course concepts into practice. By partnering with eMINTS, additional evidence about the impact of Intel Teach on student and teacher outcomes may be discovered. Since project participants include students from high-poverty, rural middle schools who are engaged to implement and evaluate the program in Grades 7–8, evaluators can study aspects of eMINTS PD and eMINTS+Intel Teach that are specifically designed to accelerate the

performance of these students through technology using standards- and inquiry-based learning.

Teacher outcomes: eMINTS PD is designed to help teachers learn how to integrate technology into their teaching, use instructional strategies that promote standards- and inquiry-based learning, and encourage collaboration and community building among students and teachers. One of the earliest reports (OSEDA, 2001a) presented the results of surveys taken by the first cohort of eMINTS teachers and administered at three different points over two years. In these early self-reports, teachers reported improvements in their inquiry-based teaching activities, their computer usage, and their perception of computing skills. A second report that focused on teacher change in lesson typology through multiple observations found that after one year of eMINTS implementation, participating teachers transitioned from teacher-centered models to hybrid or student-centered models (OSEDA, 2001b). Furthermore, early evaluations (OSEDA, 2003b) demonstrated a positive relationship between eMINTS training on inquiry-based learning strategies and teachers' enactment of those components in their practice.

Recent eMINTS program evaluations have placed a focus on program fidelity and its impact on teacher mastery (Martin et al., 2008; Martin et al., 2009). EDC's (2008) external evaluation found high levels of fidelity in program delivery, and teachers demonstrated high levels of mastery on technology integration and inquiry-based learning strategies. The evaluation also found significant positive correlations between program fidelity and teacher mastery scores on eMINTS lesson planning processes (Martin et al., 2008). Specifically, the following factors of program fidelity were correlated with lesson planning at the .01 level of significance: scaffolding instruction (.263), active work/learning (.296), modeling instruction (.388), technology utilization (.268), connection to practice (.217), and inquiry-based learning (.205). EDC's (2009) evaluation substantiated these findings, adding that "evidence [suggests] that the more closely

aligned the local implementation of eMINTS is to core program goals, the greater the impact the program has on teachers' understanding of PD concepts and on students' performance on standardized assessments." In communication arts and mathematics for Grades 4 and 5, correlation between PD fidelity and student achievement is significant at the .05 level in both 2007 and 2008. Of the various components of PD fidelity, technology utilization and inquiry-based learning became more strongly correlated with student test scores in both communication arts and mathematics as students gained experience with eMINTS (Martin et al., in press).

Section C: Experience of the Eligible Applicant

eMINTS' past performance in implementing complex projects: The eMINTS National Center has the experience to implement the eMINTS Validation Project. The entire multifaceted intervention, including fidelity measures, program materials, and implementation or processes has been developed, refined and tested by eMINTS staff throughout the past 10 years. Ninety percent of eMINTS leadership team members have been with eMINTS for at least eight of the last 10 years, providing overall program stability and continuity.

eMINTS has an extensive level of past performance in successfully managing complex projects. As the recipient of more than $12,000,000 in grants and contracts over the past 10 years, eMINTS always has met deliverables specified in grants and contracts to the satisfaction of the grantors/contractors. The complex projects represented in grants and contracts awarded include replication of eMINTS for hundreds of districts across multiple states and in Australia and completion of research studies. Working with large numbers of districts across multiple years is a strength for eMINTS staff that are strategically dispersed across Missouri. eMINTS ensures that grant/contract deliverables are tracked, documented, and achieved through the use of Web-based project management software and the University of Missouri (UM) infrastructure.

eMINTS also operates the e-Learning for Educators: Missouri program, another complex project. e-Learning builds Missouri's capacity to develop and deliver high-quality online PD. As part of a 10-state consortium, e-Learning is funded by a Ready-to-Teach grant. eMINTS has completed program requirements for e-Learning and successfully established its sustainability.

Located on the UM campus in Columbia, eMINTS has access to university resources in addition to its internal capacity to support the proposed project. UM is a member of the American Association of Universities (AAU) and is classified as "Research I" by the Carnegie Foundation. The full technological, business services and human resources assets of UM are available to eMINTS to support the project. eMINTS abides by all UM IRB policies to protect human subject research activities and to assure compliance with governing federal regulations of the U.S. Office of Human Research Protection (OHRP).

eMINTS' demonstration of closing achievement gaps/ increasing student achievement: The eMINTS National Center has earned a reputation for high-quality service. Rick Gaisford, director, Utah's State Department of Instructional Technology, and Wayne Hartschuh, Ph.D., executive director, Delaware Center for Educational Technology, testified before Congress in 2009 about the effectiveness of eMINTS in closing the achievement gaps and increasing student achievement for all groups in their states. See Section B for more information on student impact.

Experience of New Franklin School District—official local education agency (LEA): New Franklin R-1 School District (NFSD) is the official LEA partner. NFSD received competitive awards to implement eMINTS in 2006–07 and 2007–08. As a high-need rural district that has implemented eMINTS successfully, NFSD is an ideal partner. In 2009, NFSD met all adequate yearly progress (AYP) requirements in ELA, mathematics, attendance, and graduation rate, earning DESE's "Distinction in Performance" in 2008–09 and in 2009–10 (see Appendix D).

Section D: Project Evaluation

The eMINTS Validation Project evaluation seeks to address key questions about the impact of eMINTS PD on student achievement and teacher practice. The study **confirmatory questions** pertain to student achievement outcomes:

1. What is the impact of eMINTS PD on seventh- and eighth-grade students' performance in mathematics and ELA after one year of exposure to eMINTS-trained teachers?
2. What is the impact of eMINTS PD on seventh- and eighth-grade students' performance in mathematics and ELA after two years of exposure to eMINTS-trained teachers?
3. Does eMINTS+Intel Teach PD result in a greater impact on seventh- and eighth-grade students' performance in mathematics and ELA relative to eMINTS PD and to control?

In addition, **exploratory questions** on student outcomes and teacher practice will be examined. First, the evaluation will address the same three questions above but applied to:

- Secondary student outcomes of academic orientation and 21st century skills
- Teacher practice outcomes of standards-based instruction, inquiry-based learning, classroom community, and technology integration practices

Second, the impact of variations across subgroups of students will be examined:

- After one and two years of exposure to eMINTS-trained teachers, do the impacts on seventh- and eighth-grade students' outcomes vary across different student subgroups?
- Are there any variations across student subgroups in the impacts of eMINTS+Intel Teach relative to eMINTS and to control?

Finally, the study will explore whether differing years of student exposure to eMINTS-trained teachers results in variations in impact on achievement by comparing performance of students exposed to eMINTS in the first two years of the study relative to students in control schools.

Evaluation/research design: LPA will use a cluster randomized design that randomly assigns 60 schools to one of three groups. See Appendix H for details of the power analysis used to arrive at a sample size of 60 schools. As shown in Table 1, schools assigned to *Group 1* will receive the eMINTS two-year PD program (eMINTS) beginning in fall 2011; *Group 2* will receive eMINTS two-year PD beginning in fall 2011 plus a third year of Intel® Teach PD (eMINTS+Intel Teach) beginning in fall 2013; and *Group 3* will conduct business as usual (BAU) with no exposure to the eMINTS or eMINTS+Intel Teach (Control) until fall 2014.

Table 1: School Assignment

Summer 2010	**Fall 2010**		**Fall 2011**	**Fall 2012**	**Fall 2013**	**Fall 2014**	**Fall 2015**
Qualify 60 schools for project	Random Assign-ment of N=60 schools	*Group 1* eMINTS N=20	eMINTS Year 1	eMINTS Year 2	No PD	No PD	No PD
		Group 2 eMINTS+ Intel Teach N=20	eMINTS Year 1	eMINTS Year 2	eMINTS +Intel Teach	No PD	No PD
		Group 3 Control N=20	BAU	BAU	BAU	eMINTS Year 1	eMINTS Year 2

Sample: Participating study schools will be high-poverty, rural Missouri middle schools. To qualify, schools must meet requirements under Title I (schoolwide or targeted) or Title II.D (50 percent of students in poverty) and be part of the Small Rural School Achievement (SRSA) program or the Rural and Low-Income School (RLIS) program authorized under ESEA Title VI, Part B.

Incentives for schools assigned to BAU condition: eMINTS will be provided to schools assigned to the BAU condition in fall 2014. Demand for eMINTS among high-poverty rural Missouri districts far exceeds the number that can be funded by federal or state funds, so it is expected that this incentive will be sufficient to motivate schools to participate and remain in the study even if assigned to the BAU condition. Only 36 percent of eligible Title II.D districts applying for eMINTS were awarded grants in the past seven years. No additional grants are planned due to cuts in Title II.D. State funding for eMINTS is not available. Within two weeks, *68 letters of interest were received from schools eligible to participate*, indicating high demand for eMINTS and schools' willingness to wait three years if they are guaranteed an opportunity to implement eMINTS. Teachers in the BAU condition will receive a stipend for their cooperation.

Data collection: Table 2 summarizes data collection plans for teacher and student outcomes from spring (Sp) 2011 to spring (Sp) 2014 and for fidelity measures from fall (F) 2011 to spring (Sp) 2014. Student outcome data includes MAP results in ELA and mathematics. Students' academic orientation and 21st century skills will be studied using annual student surveys and Learning.com's 21st Century Skills Assessment (Condon, C., Dawson, M., Molefe, A., & Swanlund, A., 2009), respectively. Teacher outcomes will be measured through annual surveys and classroom observations. Fidelity measures include observations of PD sessions, logs detailing in-classroom coaching activities, and audits of technology resources at each school site. Appendix H provides detailed descriptions of the measures.

Table 2: Data Collection Timeline

	2010–11		2011–12		2012–13		2013–14		2014–15
	Year 1		**Year 2**		**Year 3**		**Year 4**		**Year 5**
Outcomes	**F**	**Sp**	**F**	**Sp**	**F**	**Sp**	**F**	**Sp**	
MAP test (math, ELA)		X		X		X		X	
Student 21st century skills test		X		X		X		X	
Student survey		X		X		X		X	
Teacher survey		X		X		X		X	
Classroom observation		X		X		X		X	
Fidelity measures									
PD observations			X	X	X	X	X	X	
eIS coaching logs			X	X	X	X	X	X	
PD/attendance records			X	X	X	X	X	X	
Technology audit			X		X		X		
Teacher lesson plan				X		X		X	

Implementation fidelity: To fully understand the PD provided to staff in schools assigned to eMINTS and eMINTS+Intel Teach, PD sessions will be observed and logs of eIS will be collected along with records of in-classroom coaching, records of the total hours of PD delivered to schools, and implementation audits of key technology resources such as computers, SMART Boards (interactive whiteboards), software, and other resources associated with eMINTS program implementation. These data sources allow the determination of the extent to which eIS implement the essential eMINTS program components in the schools participating in this study. To assess the receipt of eMINTS services by school staff, we will collect data on teacher attendance at each PD session and one structured lesson plan from each teacher, which is required as part of the eMINTS program. Appendix H provides a timeline of the eMINTS PD and a detailed description of the measures evaluators will use to assess implementation fidelity.

As part of the overall fidelity assessment, treatment differentiation will be included in the definition of treatment fidelity (Cordray & Pion, 2006; Waltz, Addis, Koerner, & Jacobson, 1993). Treatment differentiation suggests that the underlying constructs embedded in the treatment should be stronger or different from the counterfactual condition. Measuring this differentiation requires a parallel "fidelity" assessment of programmatic components in both conditions (Hulleman & Cordray, 2009). This assessment is referred to as the achieved relative strength of the contrast (Cordray & Jacobs, 2005), or the difference between the treatment as implemented and the control as implemented (Hulleman & Cordray, 2009). To assess the achieved relative strength of the intervention, indices will be developed to contrast the eMINTS and BAU condition after two years (in 2013), and the eMINTS+Intel Teach and eMINTS-only condition (in 2014). These indices will be derived from the same measures used as teacher outcomes and intermediate student outcomes (e.g., academic orientation and 21st century skills).

Analysis: The randomization of schools to an eMINTS, eMINTS+Intel Teach, or control condition provides a strong framework with which to accurately estimate program impact. This is because the randomization of a sufficient number of participants to one of three conditions should, on average, equalize any measured and unmeasured baseline differences among the three groups that may confound impact estimates. Nevertheless, to obtain more precise estimates evaluators will directly account for student, classroom, and school characteristics in the analytic models. Because of the natural clustering of students within schools, evaluators will account for variances that occur at different levels by positing two-level hierarchical models for student outcomes. Although students are nested within classrooms that are nested within schools, a majority of the prospective participating schools will most likely have only one or two teachers per subject per grade, leaving insufficient power to assess classroom variability within schools. The implication of the two-level model is that variability in student outcomes between classrooms within schools is completely confounded with variability between schools. For questions pertaining to teacher practices, conventional single-level models that account for fixed school, grade, and subject area effects will be employed. For student outcomes, evaluators will estimate the overall impacts of the program separately for mathematics and ELA using the pooled sample of seventh- and eighth-grade students. To answer the first confirmatory research question, evaluators will fit the following model to the pooled sample after spring 2013:

Level 1 (students): $Y_{ij} = \pi_{0j} + \pi_{1j} Grade_{ij} + \boldsymbol{X}_{ij}\boldsymbol{\pi}_{2j} + \boldsymbol{C}_{ij}\boldsymbol{\pi}_{3j} + \varepsilon_{ij}$

Level 2 (schools): $\pi_{0j} = \beta_{00} + \beta_{01} T_j + \boldsymbol{Z}_j \boldsymbol{\beta}_{02} + r_{0j}$

$\pi_{1j} = \beta_{10}, \boldsymbol{\pi}_{2j} = \boldsymbol{\beta}_{20}, \ \boldsymbol{\pi}_{3j} = \boldsymbol{\beta}_{30}$

where Y_{ij} is the achievement (i.e., ELA or mathematics test score) of student i in school j; T_j is a

treatment status indicator that is equal to 1 for eMINTS schools and 0 for comparison schools; $Grade_{ij}$ is a grade-level indicator that is equal to –½ for eighth-grade students and ½ for seventh-grade students; $\boldsymbol{X}_{ij}$ is a row vector of background characteristics (e.g., prior academic achievement, race/ethnicity) of student i in school j; $\boldsymbol{C}_{ij}$ is a row vector of teacher characteristics (e.g., teaching experience, degrees held, gender) for student i in school j; $\boldsymbol{Z}_j$ is a row vector of characteristics (e.g., average school achievement, percentage of racial/ethnic minority students, school size) for school j; and ε_{ij} and r_{0j} are random residuals at the student and school levels, respectively. Note that by centering a student's grade-level indicator at zero (that is, by coding grade level as –½ for seventh graders and ½ for eighth graders), evaluators are implicitly controlling for differences in the proportions of seventh and eighth graders across schools.

With the above formulation, β_{00} is the overall average achievement level of seventh and eighth graders, β_{10} is the average level of achievement gap between seventh and eighth graders, and β_{01}, the parameter of interest, is the overall impact of the eMINTS program on the performance of seventh and eighth graders in a particular subject area on MAP administered in spring 2013. As part of the exploratory analyses, evaluators can also estimate grade-specific impact estimates on each subject area by simply extending the above model, allowing the grade-level indicator to vary non randomly as a function of the treatment indicator. That is, at level two, the coefficient for $Grade_{ij}$ can be modeled as $\pi_{1j} = \beta_{10}+\beta_{11}T_j$. In this case, β_{01} would be the overall impact of the eMINTS program on the performance of seventh graders, and $\beta_{01} + \beta_{11}$ would be the corresponding impact on eighth graders.

To answer research questions 2 and 3, evaluators will employ similar models as above except that the model for the school-specific intercept will be specified as

$\pi_{0j} = \beta_{00} + \beta_{01}T_j + \beta_{01}^{*}T_j^{*} + \boldsymbol{S_j\beta_{02}} + r_{0j}$, where T_j^{*} is equal to 1 for eMINTS+Intel Teach and 0 for control. Thus, β_{01} and β_{01}^{*} are the estimated impacts of eMINTS and eMINTS+Intel Teach, respectively, relative to the control, and $\beta_{01}^{*} - \beta_{01}$ is the estimated impact of eMINTS+Intel Teach relative to eMINTS (original two-year program) using MAP results from spring 2014.

The exploratory questions on the secondary student outcomes (academic orientation and 21st century skills) will employ similar models as above. To examine impacts on specific student subgroups of interest, the above models can easily be modified to include an interaction of the treatment indicator(s) with the appropriate student-level covariates (e.g., race/ethnicity).

Exploratory impact analysis of teacher outcomes will employ a standard single-level[1] analysis of covariance model on the sample of teachers pooled across subjects and grades:

$$Y_{ij} = \beta_0 + \beta_1 T_j + +\beta_2 Grade_{ij} + \beta_3 Subject_{ij} + \boldsymbol{C_{ij}\beta_4} + \boldsymbol{Z_{ij}\beta_5} + \varepsilon_{ij},$$

where Y_{ij} is the outcome (e.g., index of standards-based instruction) of teacher i in school j; T_j is a treatment indicator that is equal to 1 if school j is an eMINTS school, and 0 if it is a comparison school; $Grade_{ij}$ and $Subject_{ij}$ are, respectively, the grade-level and subject taught by teacher i in school; and $\boldsymbol{C_{ij}}$ and $\boldsymbol{Z_{ij}}$ are baseline teacher and school characteristics, respectively.

[1] Sample size and power considerations preclude using a two-level (teachers within schools) random effects model for teacher outcomes. Because it is well known that ordinary least squares estimators that ignore clustering yield standard errors that are downwardly biased, and consequently, inflated Type I errors, adjustments will be applied for clustering in effect-size estimators. Specifically, Hedge's effect size estimator, *g*, with clustering correction (Hedges, 2005; What Works Clearinghouse, 2008) will be used.

For analysis of teacher outcomes in spring 2013 and 2014, this model will be modified analogously to the models for student outcomes by adding a treatment indicator for eMINTS+Intel Teach. Further, to obtain impact estimates for specific subjects (mathematics or ELA) or grades, appropriate interactions with the treatment indicator will be incorporated.

Finally, questions on differential program impact due to differing amounts of student exposure to the eMINTS program will be addressed by fitting the two-level models for student outcomes to the appropriate subset of students (e.g., students who were exposed to eMINTS in the first two years of the project [fall 2011–spring 2013] relative to students who were in control schools in those years and those who were exposed to eMINTS+Intel Teach for three years of the project [fall 2011–spring 2014] relative to those who were in control schools for those years).

Section E: Strategy and Capacity to Bring to Scale

Number of students to be reached and capacity. Information about the proposed project and opportunities for participation were e-mailed to 189 superintendents in districts identified preliminarily by Learning Point Associates (LPA) researchers as meeting evaluation study guidelines. Of schools identified as being preliminarily eligible, 68 schools submitted letters of interest indicating their willingness to participate in the project (see Appendix D).

The number of students/teachers to be reached by the project is estimated in Table 3.

Table 3: Number of Students and Teachers in Project

Project Year	**1**	**2**	**3**	**4**	**5**
Students	3,000	3,000	1,500	1,500	1,500
Teachers	40	40	20	20	20

eMINTS' and NFSD capacity to bring project to scale: eMINTS has implemented its

program successfully in support of at least 4,000 students or more each year for the past 10 years. eMINTS' experience indicates that one eIS is needed to serve approximately 15–20 middle school teachers, who each may teach up to 120–125 students. With 16 full-time eIS supported by 14 administrative/support staff and the NFSD local eIS, the capacity to reach the proposed number of students and teachers across the duration of the project clearly exists.

Feasibility of project to scale (regional and national): The capacity of eMINTS to scale the project implementation to state, regional, or national levels is verified by seven years of experience in scaling eMINTS PD across multiple states and in Australia. eMINTS developed a "train-the-trainer" program in 2003 to facilitate scaling. The program provides schools/districts with the capacity to scale eMINTS locally without relying directly on eMINTS to provide PD. eMINTS has trained and provides support to more than 150 trainers across nine states who deliver eMINTS PD locally. The program has made it possible for eMINTS to scale in Missouri, nationally, and internationally at relatively high levels even for a nonprofit university entity.

eMINTS has created electronic password-protected access to all approved eMINTS PD materials for participating teachers, eIS, and certified district-level trainers using the Moodle learning management system. The eMINTS Moodle is housed on a secure server, remotely backed up, and supported by a Moodle hosting entity with more than eight years of experience.

eMINTS has invested time and funding in the development, validation, and ongoing use of processes and instruments to measure and ensure program fidelity if positive results are obtained as a result of the project. EDC was selected in 2006 through a competitive bid process to design, develop, and deliver external evaluation services, including validation of program fidelity measures that will be used in the project and for future scaling efforts. eMINTS has three years of experience using the fidelity processes to assure districts that their eMINTS

implementations, including the use of the train-the-trainer program, are progressing within validated guidelines. NFSD was part of the original program fidelity work and has experience in supporting eMINTS fidelity processes. eMINTS recognizes the importance of program fidelity in guaranteeing that teachers understand program concepts and improved student outcomes result.

Evidence of the ease of use and user satisfaction with eMINTS has been documented in multiple publications, including articles written by educators implementing eMINTS in Missouri (McEowen, 2009) and in other states (Gaisford & Webb, 2006). Educators uniformly rate eMINTS ease of implementation and their satisfaction with eMINTS at an average of 4.6 or higher on a Likert scale, where "1" indicates "very unsatisfied" and "5" indicates "highly satisfied." eMINTS surveys participants anonymously twice each year about their PD program and has retained more than eight years of formative survey data regarding user perceptions.

Estimates of cost: Table 4 provides estimated costs (startup and annual ongoing operation) of the proposed project for the students who will be targeted for the project and for 100,000, 250,000, and 500,000 students. Projected costs include indirect costs pertinent to the applicants and all partners involved. *Note*: Cost per student for 100,000, 250,000, and 500,000 students does not include full program evaluation costs that are part of the proposal.

Table 4: Estimated Costs Per Student (Project, 100,000, 250,000, and 500,000)

Year	Cost Per Student	10,500 Students	100,000 Students	250,000 Students	500,000 Students
Start-up		$483	$44,452,438	$111,131,095	$222,262,190
Ongoing		$157	$15,759,914	$39,399,786	$78,799,571
Ongoing		$83	$4,622,504	$11,556,262	$23,112,523

Mechanisms to disseminate project information: Four major audiences are planned for dissemination activities: other state education agencies (SEAs), LEAs within Missouri and other states, educational researchers interested in standards-based instruction and PD, and educational policymakers. eMINTS has structured and sustained close professional partnerships with key SEAs, including the Missouri K–12 and higher education agencies, and SEAs in other states. The State Education Technology Directors Association (SETDA) has proposed to partner with eMINTS to enhance dissemination and increase success in scale-up efforts using all of their available networks and relationships (see SETDA proposal and letter of support in Appendix D).

In Years 4 and 5 of the project, key resources developed by the project, including descriptions of implementations in each district, program implementation protocols, interim and final evaluation research reports, presentations and articles about selected implementations, and collections of lessons learned about effective practices all will be made available on the eMINTS website. The Missouri School Boards Association (MSBA) and the Missouri SEA (DESE) have agreed to provide website space to disseminate key project outcomes. eMINTS staff, NFSD staff and LPA project staff will arrange to present at national, regional, and local conferences and write articles to be submitted to journals for administrators, teachers, and researchers. LPA will take primary responsibility for publications and presentations to the research community; eMINTS, NFSD, and LEAs will take responsibility for dissemination to SEA technology directors, PD leaders, and other schools through national organizations. SMART Technologies has agreed to continue their past support of eMINTS by sponsoring travel costs for staff and teachers to make presentations about the eMINTS Validation Project at national conferences.

Section F: Sustainability

Resources and support to operate project beyond grant period: eMINTS has sustained

itself as an independent business unit with an operating budget of more than $3,000,000 annually since 2003. With reserve operational funds of 20 percent, eMINTS has the fiscal capacity to manage the project effectively during and following the grant funding period. eMINTS staff are experienced veteran educators who have managed the program since its inception. eMINTS is an official Intel Teach Affiliate (ITA) and has Intel's support to train cadres of Master and Senior Trainers throughout the grant funding period. eMINTS is well positioned to administer the grant, support replications across the U.S., and sustain program operations beyond the grant period.

The eMINTS Validation Project has the support of the Vice President Steve Graham, UM Office of Academic Affairs; Commissioner Chris Nicastro, Missouri DESE; Commissioner Robert Stein, Missouri DHE; and Executive Director Carter Ward MSBA, whose letters of support in Appendix D indicate that strong working relationships with eMINTS will support the project's activities and provide for sustainability. Endorsements by these agencies provide access to critical groups of stakeholders and policymakers who can add to the program's sustainability.

Potential and planning for incorporation of project into ongoing work of applicant and partners: The project represents the core work of the eMINTS National Center. It is the lynchpin in securing 10 years of effort in developing high-quality PD that will propel standards-based education supported by technology to the forefront of education. Every operational aspect of the eMINTS National Center is devoted to sustaining project activities and benefits of the ongoing work. eMINTS has secured long-term partnerships with a diverse group of stakeholders, including corporate sponsors and SETDA (see Appendix D), to ensure sustainability at the end of the grant period. NFSD's agreement to serve as official partner strengthened Apple's and SMART Technologies' project commitments of due to their previous relationships with NFSD and the district's sustained support of eMINTS. The eMINTS Advisory Board includes

stakeholders who are invested in the program. They provide guidance to eMINTS leadership in policy formation, strategic planning, fiscal planning, resource development and ensuring overall program accountability. The eMINTS Advisory Board will help sustain the program during and after the grant period by acting as partners who build critical relationships, sponsors who advocate for eMINTS, and resource developers who secure essential resources and connections.

Section G: Management Plan and Key Personnel

Adequacy of the management plan: The management plan for achieving project goals and objectives on time and within budget will follow plans used in the management of other successful projects. eMINTS routinely defines project responsibilities and sets timelines and milestones for project tasks and monitors them, correcting the course as needed. Project management software will be used to ensure project deliverables are on time and within budget. The UM Office of Academic Affairs will provide additional internal monitoring of project activities and deliverables along with the eMINTS Advisory Board.

A Project Management Team (PMT), led by senior project staff from eMINTS, LPA and NFSD, will be structured to include representatives from all partner groups. The PMT will meet at least monthly to set overall priorities, review and revise existing eMINTS implementation requirements, and manage work groups to coordinate the work of staff from various partner groups. Work groups will handle tasks including management of partner LEA contracts, coordination of evaluation / research activities in LEAs, preparation and delivery of eMINTS PD and eMINTS+Intel Teach, and technical assistance to LEAs in installing required technology resources. Table 5 specifies project tasks, responsibilities, timelines, and milestones.

Table 5: Project Management Plan

Year 1 (10/10 through 9/11)		
Activity	**Responsible Party**	**Benchmark/Milestone Date**
Create project management team	eMINTS	First meeting held by 10/5/10
Verify eligibility of project LEAs	LPA/eMINTS	Sixty LEAs qualify by award
Assign LEAs to groups	LPA	Groups created by 10/15/10
Hold Group Orientation	eMINTS	Orientation completed 11/15/10
Complete contract documents	eMINTS	Finalized by 12/31/10
LEAs order/install all technology	LEAs	Ordered and installed by 6/30/11
Provide technical assistance and monitoring to LEAs	eMINTS/NFSD	Technology resources functional—Groups 1 and 2 schools by 7/15/11
Finalize evaluation/study instruments	LPA/eMINTS	Submitted to IRB by 2/28/11
Baseline student and teacher data collection (Groups 1, 2, 3)	LPA/NFSD	Data collected from Groups 1, 2, and 3 by 5/30/11
Groups 1 and 2 begin Year 1 eMINTS PD	eMINTS	Year 1 PD begins by 8/31/11
Project dissemination activities	eMINTS/SETDA	Initial dissemination by 9/30/11
Develop scalability/sustainability plans	eMINTS	Plans developed with input from stakeholders by 9/30/11

Year 2 (10/11 through 9/12)		
Fidelity data collection (Groups 1 and 2)	LPA/NFSD	Collected by 12/15/11 and 5/30/12
On-site monitoring of eMINTS implementations	eMINTS	Ongoing throughout 2011-2012 school year
Data collection (Groups 1, 2, 3)	LPA/NFSD	Collected by 6/30/12
Project dissemination continues	eMINTS/SETDA	Ongoing throughout 2011–12
Groups 1 and 2 begin Year 2 eMINTS PD	eMINTS	Year 2 PD begins by 8/31/12
Approve scalability / sustainability plans	eMINTS	Plans approved by stakeholders 9/30/12
Year 3 (10/12 through 9/13)		
Groups 1 and 2 end eMINTS PD	eMINTS	PD completed by 6/30/12
Fidelity data collection (Groups 1 and 2)	LPA	Collected by 12/15/12 and 5/30/13
Student and teacher data collection	LPA	Data collected by 6/30/13
Project dissemination continues	eMINTS/NFSD/SETDA	Ongoing throughout 2012–13
Group 2 begins eMINTS+Intel Teach	eMINTS	PD begins by 8/31/13
Implement and monitor scalability/	eMINTS	Plans monitored by stakeholders

sustainability plans		through 2013
Year 4 (10/13 through 9/14)		
Group 3 implementation meeting	eMINTS	Meeting completed by 11/15/13
Complete contract documents	eMINTS	Group 3 finalized by 12/31/13
Group 3 orders/installs technology	LEAs	Ordered and installed by 6/30/14
Provide technical assistance and monitoring to Group 3 LEAs	eMINTS/NFSD	Technology resources functional—Group 3 by 7/15/14
Fidelity data collection (Group 3)	LPA	Collected by 12/15/13 and 5/30/14
Student and teacher data collection	LPA	Data collected by 6/30/14
Project dissemination continues	eMINTS/LPA/SETDA	Ongoing throughout 2013–14
Group 3 begins Year 1 eMINTS PD	eMINTS	Year 1 PD begins by 8/31/14
Implement and monitor scalability/ sustainability plans	eMINTS	Plans monitored by stakeholders through 2013
Year 5 (10/14 through 9/15)		
Data analysis and initial findings	LPA	Analyses completed by 1/30/15
Initial findings report developed	LPA	Report completed by 4/30/15
Continue project dissemination	LPA/eMINTS	Initial findings by 6/1/15
Final report submitted	LPA/eMINTS	Report submitted by 9/30/15

Project scalability and sustainability plans implemented if results positive	eMINTS/DESE/ DHE/MSBA	Project scaled and sustained through 2015 and beyond
Ongoing project results dissemination	LPA/eMINTS/LEAs/ SETDA	Ongoing through 2015

Experience of Learning Point Associates (LPA)—external evaluator: LPA is a 25-year-old nonprofit organization and has evaluated the implementation and impact of innovations designed to improve the performance, achievement, and attainment of high-risk students in thousands of schools and local education settings for the U.S. Department of Education, many state education agencies, numerous LEAs, and a range of private-sector nonprofit and for-profit entities. See www.learningpt.org for additional information. LPA designs and conducts mixed-method evaluations that maintain rigorous standards while serving client needs and accommodating constraints related to budgets, timelines, and evaluation audiences and conditions. LPA conducts external evaluations that assess program effectiveness, fidelity to program design, level of implementation, and related factors. The organization's capacity to balance client need for information and high methodological standards is due to its knowledge and experience with a repertoire of evaluation designs, including randomized experiments, quasi experiments utilizing matched-comparison groups and regression discontinuity, and descriptive cross-sectional studies. LPA has experience in conducting case-study evaluations and cross-case analyses using a broad range of qualitative methodologies to understand program characteristics and impact. LPA's ongoing experimental research studies of educational interventions include the IES-funded randomized trials of Indiana's System of Diagnostic Assessments and the Content Literacy Continuum schoolwide adolescent literacy program among others.

Qualifications of key project personnel and evaluators: Key project personnel and evaluators have the training and experience to achieve project objectives (see Appendix C).

Project Director—Monica Beglau, Ed.D., earned her doctoral degree in educational leadership from the University of Wyoming and has served as executive director of the eMINTS National Center since 2000. She has previous experience with two school-university partnership projects (in Wyoming and Missouri) and has 18 years experience in K–12 education as an elementary principal and teacher. She has made numerous presentations to national and international audiences about the eMINTS programs, educational technology, and professional development. Dr. Beglau has extensive experience in planning, managing, and sustaining major grant- and contract-funded educational initiatives and budget development and accountability.

Assistant Project Director—Lorie Kaplan anticipates the completion of her doctoral degree in educational leadership and policy analysis from the University of Missouri in May 2011 and has served in various leadership roles for eMINTS since 2000. She also has three years of experience as a management analyst for quality and planning on other UM projects. Ms. Kaplan has knowledge of Missouri's education system and school district complexities.

NFSD Project Liaison—David Haggard, Ed.D., has a doctorate of education in educational leadership and is superintendent of the NFSD. He has served as an administrator in NFSD for 10 years and is well versed in all aspects of eMINTS. Dr. Haggard has also served as president of the Missouri State Teachers Association (MSTA) making numerous presentations.

Lead Project Evaluator—W. Christopher Brandt, Ph.D., is a senior research associate for the Regional Educational Laboratory (REL) Midwest at LPA. Dr. Brandt has led projects that utilize a wide range of quantitative and qualitative methods to study and evaluate numerous state and district reform efforts. Currently, he is overseeing a three-year randomized controlled trial

funded by IES that investigates the impact of a computer-adaptive assessment system on teacher practice and student achievement. He completed two studies describing state and local teacher evaluation policy and guidance in the Midwest region and led a team to assist the Milwaukee Public Schools in developing and validating assessments to evaluate summer school programs.

Assistant Project Evaluator—Coby Meyers, Ph.D., is a research associate at LPA where he designs surveys, analyzes interview and other qualitative data, conducts statistical analyses, and pursues grants and other external funding. Dr. Meyers also plays integral roles in various school turnaround initiatives—an area in which he has presented and published, including coauthoring one book, *Turning Around Failing Schools: Leadership Lessons From the Organizational Sciences,* and two refereed journal articles. Dr. Meyers is proficient in Stata, SAS, HLM, and Nvivo8. He also has practical in-class experience as a secondary English and literature teacher. He earned a master's degree in secondary education and English at the University of Kentucky and a doctoral degree in education policy at Vanderbilt University.

Project Statistician—Ayrin C. Molefe, Ph. D., is a statistician/methodologist at LPA with a doctoral degree in statistics from Northern Illinois University who works on the REL Midwest team on two IES-funded, cluster-randomized studies: (1) an evaluation of the Measures of Academic Progress (MAP) program (led by David Cordray, Ph.D., of Vanderbilt University) and (2) a study of the impact of Indiana's System of Diagnostic Assessments. Dr. Molefe has more than 10 years of extensive SAS programming experience and is well versed in R, S-PLUS, SYSTAT, and Minitab software. Dr. Molefe recently completed extensive training in randomized controlled trials under Larry Hedges and Mark Lipsey, quasi-experimental methods under Tom Cook and Will Shadish, hierarchical linear models under Stephen Raudenbush and Anthony Bryk, and missing data techniques under Paul Allison.

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