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**SAMPLE WORKPLAN**

***MATH WITH CONFIDENCE* WORK PLAN**

***This sample provides detail for some, but not all, of the research questions listed below.***

***It is intended to demonstrate the detail necessary to operationalize a research idea and identify the resources required for success.***

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| **What significant problem/need does your project address?** | Low elementary school teacher confidence to teach math, which impacts student interest/confidence/achievement in math, which impacts entry/success/persistence in STEM education/career pipelines |
| **How does your project address the problem/need?** | Project will implement randomized controlled trial to assess intervention designed to increase 3rd-grade teachers’ confidence in effectively teaching mathematics; measure their students’ interest/confidence/achievement |
| **How is your project innovative?** | Goes beyond teacher knowledge and skills… measures impact of intervention on teachers’ confidence, attitudes, self-efficacy in teaching math, which should translate to increased student interest/confidence/achievement |
| **Who will benefit from your findings?** | Directly: Teacher/student participants; research team and graduate students; me (tenure track) |
| Indirectly: participants’ schools and districts; TX State teacher prep faculty and their students |
| **What is the broader impact of your research?** | Improve practice of in-service elementary teachers; improve professional development for in-service elementary teachers; improve preparation of elementary teachers; improve student engagement and achievement in math; increase entry/success/persistence of students in STEM pipeline; improve US competitiveness in global economy… change the world! |

**Research Question #1: Will the *Math with Confidence* intervention increase the confidence of 3rd-grade teachers to teach math?**

**Research Question #2: Will students of *Math with Confidence* teachers demonstrate increased interest and confidence in math?**

**Research Question #3: Will students of *Math with Confidence* teachers demonstrate increased academic achievement in math?**

**Research Question #4: What is the relationship between teacher confidence in teaching math and student math achievement?**

**Research Question #5: Does teacher confidence change in the year after the *Math with Confidence* intervention?**

**Research Question #6: Does student confidence and achievement change in the year after the *Math with Confidence* intervention?**

**Goal #1: *Math with Confidence* findings will be widely disseminated to interested audiences (researchers, practitioners, policymakers)**

**Research Question #1: Will the *Math with Confidence* intervention increase the confidence of 3rd-grade teachers to teach math?**

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| **Research Objective 1.1. Identify teacher participants for treatment and control groups** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Identify Partner ISDs | May 2017 |  | Partner ISDs confirmed | PI |  |
| 1. Review the literature on teacher confidence in teaching math to provide context for significant problem/proposed project | June 2017 |  | Summary of relevant literature | Research Team  Graduate Research Asst (GRA) |  |
| 1. Determine teacher sample size | June 2017 |  | Power Analysis | PI  Sr Research Analyst (SRA) |  |
| 1. Identify relevant study variables re: teachers (e.g., ethnicity, experience, cert route); schools (e.g., size, wealth, performance, rating, student demographics) | June 2017 | Texas Academic Performance Reports (TEA website) | Variables identified | Research Team |  |
| 1. Execute MOUs w/ partner ISDs (treatment and control) | June 2017 | MOU boilerplate  $5000 ISD stipend | Executed MOUs | PI  Pre-Award RC | TX State general counsel must approve |
| 1. ERC proposal for Research Question #5 | July 2017 | $10,000 fee | Dataset received | PI  SRA | ERC proposal submitted upon award |
| 1. Identify teacher treatment and control groups, along with their students | July 2017 | Roster of 3rd-grade teachers from partner ISDs | Roster of potential participating teachers/contact info | SRA |  |
| 1. Collect data for identified teacher variables (treatment) from partner ISDs (PEIMS) | July 2017 | Submit identified variables to ISDs (see 4.) | ISD PEIMS datasets | PI  SRA |  |
| 1. Invite teachers to participate (treatment and control) | July 2017 | Letter of invitation  $1000 for treatment participants  $100 for control participants | Final roster of teacher participants (treatment and control) | PI | Total cost for stipends based on results of power analysis (R1.1.1.) |

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| **Research Objective 1.2. Determine baseline confidence and classroom practices of teacher participants (treatment and control)** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Identify appropriate mathematics teacher confidence instrument | June 2017 |  | Instrument selected | PI  SRA |  |
| 1. Purchase instrument | June 2017 | Purchase – Cost TBD | Instrument purchased | PI  Post-Award RC |  |
| 1. Administer instrument to teachers (treatment and control) | Aug 2017 | Schedule date/time  Secure test site(s) | Instrument administered | Research Team  GRA |  |
| 1. Data analysis: Enter baseline results. Store database securely. | Aug-Sept 2017 | Data entry, if required  ***-OR-***  Download data from vendor | Database and summary of results | GRA | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |
| 1. Interpretation of baseline teacher confidence | Sept-Oct 2017 |  | Report | Research Team |  |
| 1. Conduct inter- and intra-rater reliability sessions for Danielson teacher observation instrument | Sept-Oct 2017 | $500 Observer stipends | Database with observer ratings | Observers  SRA |  |
| 1. Calculate inter- and intra-rater reliability of observers | Oct 2017 |  | Report | SRA |  |
| 1. Observe teachers (treatment and control) using Danielson Framework to assess classroom practices | Oct-Dec 2017 | Included in Observer stipends | Observation score sheets | Observers |  |
| 1. Data analysis of observation data: Enter results. Store database securely. | Jan-Feb 2018 | Data entry and analysis | Database and summary of results | GRA | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |
| 1. Interpretation of observation data | Mar 2018 |  | Report | Research Team | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |

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| **Research Objective 1.3. Develop components of *Math with Confidence* intervention** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
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| **Research Objective 1.4. Train grant personnel to deliver *Math with Confidence* intervention** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
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| **Research Objective 1.5. Deliver *Math with Confidence* intervention** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
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| **Research Objective 1.6. Determine post-intervention confidence of treatment and control teachers.** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Administer post instrument to teachers (treatment and control) | Apr-May 2018 | Schedule date/time  Secure test site(s) | Instrument administered | Research Team  GRA |  |
| 1. Data analysis: Enter post-confidence results. Store database securely. | May 2018 | Data entry, if required  ***-OR-***  Download data from vendor | Database and summary of results | GRA | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |
| 1. Interpretation of post teacher confidence, by study variables | May 2018 |  | Report | Research Team |  |

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| **Research Objective 1.7. Submit pre- and post- teacher confidence and teacher observation data to ERC for deidentification** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Submit Supplemental Data Request to TEA | May-June 2018 | $70/hr for ERC deidentification services (final fee depends on request (estimate $500)  Pre- & Post- confidence database  Teacher observation data | Data request submitted to TEA | GRA | There must be a firewall between the researcher who will work in the ERC and the identified data, such that the ERC analyst will not be able to identifiy data associated with teachers |
| **Research Objective 1.8. Determine impact of *Math with Confidence* intervention on teacher confidence and classroom practices** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
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**Research Question #2: Will students of *Math with Confidence* teachers demonstrate increased interest and confidence in math?**

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| **Research Objective 2.1. Determine baseline confidence of students (treatment and control)** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Identify appropriate mathematics student confidence instrument | June 2017 |  | Instrument selected | PI  SRA |  |
| 1. Purchase instrument | June 2017 | Purchase – Cost TBD | Instrument purchased | PI  Post-Award RC |  |
| 1. Administer instrument to students (treatment and control) | Aug 2017 | Schedule date/time  Secure test site(s) | Instrument administered | Research Team  GRA |  |
| 1. Data analysis: Enter baseline results. Store database securely. | Aug-Sept 2017 | Data entry, if required  ***-OR-***  Download data from vendor | Database and summary of results | GRA | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |
| 1. Interpretation of baseline student confidence | Sept-Oct 2017 |  | Report | Research Team |  |
| **Research Objective 2.2. Determine post-intervention confidence of treatment and control students.** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Administer post instrument to students (treatment and control) | Apr-May 2018 | Schedule date/time  Secure test site(s) | Instrument administered | Research Team  GRA |  |
| 1. Data analysis: Enter post-confidence results. Store database securely. | May 2018 | Data entry, if required  ***-OR-***  Download data from vendor | Database and summary of results | GRA | SRA may conduct analysis of data if data are deidentified, because of ERC access and use by SRA |
| 1. Interpretation of post student confidence, by study variables | May 2018 |  | Report | Research Team |  |

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| **Research Objective 2.3. Submit pre- and post- student confidence and teacher observation data to ERC for deidentification** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Submit Supplemental Data Request to TEA | May-June 2018 | $70/hr for ERC deidentification services (final fee depends on request (estimate $500)  Pre- & Post- confidence database  Teacher observation data | Data request submitted to TEA | GRA | The teacher and student data will be submitted in the same Supplemtal Data Request |
| **Research Objective 2.4. Statistically analyze data to determine whether treatment students show increased confidence in teaching math above that of control students.** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Build powerful statistical model; analyze results | June 2018 | Student confidence data | Report | SRA | Model may use confidence and achievement results |

**Research Question #3: Will students of *Math with Confidence* teachers demonstrate increased academic achievement in math?**

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| **Research Objective 3.1. Statistically analyze data to determine whether treatment students show increased achievement in math above that of control students.** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Build powerful statistical model; analyze results | June 2018 | State math achievement data from ERC | Report | SRA | Model may use confidence and achievement results |

**Research Question #4: What is the relationship between teacher confidence in teaching math and student math achievement?**

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| **Research Objective 3.1. Statistically analyze data to determine the relationship between teachers’ confidence and students’ math achievement.** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Build regression model of teacher confidence and student achievement results | July-August 2018 | Teacher and student demographics  Teacher confidence data  Student achievement data | Data analysis and summary  Data analysis and interpretation | Research Team  SRA |  |

**Research Question #5: Does teacher confidence change in the year after the *Math with Confidence* intervention?**

**Research Question #6: Does student confidence and achievement change in the year after the *Math with Confidence* intervention?**

**Goal #1: *Math with Confidence* findings will be widely disseminated to interested audiences (researchers, practitioners, policymakers)**

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| **Goal Objective 1.1. Publish Findings in Peer-Reviewed Journals** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Identify targeted journal(s) and lead author (s) | Aug 2018 |  | List of targeted journal(s) | Research Team |  |
| 1. Prepare manuscript(s) | Aug-Dec 2018 | Draft, review, edit, repeat | Manuscript drafts | Research Team  SRA  Pre-Award RC |  |
| 1. Submit manuscript(s) | Dec 2018 | Publication fee(s) | Final manuscript draft | Author(s) | Build cost into proposal budget, if allowable |

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| **Goal Objective 1.2. Present Findings at Conferences** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| 1. Identify targeted conference(s) and presenter(s) |  |  | List of targeted conference(s) | Research Team  Pre-Award RC |  |
| 1. Prepare presentation(s) | Aug-Dec 2018 | Draft, review, edit, repeat | Drafts of posters, white papers, PowerPoint slides | Presenter(s)  Pre-Award RC |  |
| 1. Submit presentation proposal | TBD (based on conference proposal submission deadlines) |  | Proposal submitted | Presenter  Research Team |  |
| 1. Present at conference(s) | TBD (based on dates of conferences | Travel costs | Final presentation materials | Presenter(s) | Build cost into proposal budget, if allowable |
| **Goal Objective 1.3. Disseminate Findings using Other Communication Vehicles (e.g., practitioner magazines, media, testimony)** | | | | | |
| **Key Action** | **Timeframe** | **Direct Costs**  **(e.g., data, stipends, supplies, travel)** | **Milestone** | **Personnel**  **(use to generate**  **time allocation/effort)** | **Comments** |
| Identify targeted audiences and communication vehicles |  |  | List of targeted audiences/vehicles | Research Team  Pre-Award RC | e.g., C&I Chair for possible changes to elementary teacher prep, TEPSA, math teachers org |
| Prepare communications |  |  | Drafts | Author(s)  Pre-Award RC  COE Outreach Coord. |  |
| Communications presented/published |  |  | Final versions | Author(s) |  |