

Proposal Narrative

The goal of this proposal is to describe the strategies and plans for developing and providing professional development to effectively utilize open educational resources (OER) for the learning and teaching of mathematics for Maine grades 7-12 educators. The professional development will focus on use of research-based instructional methods for mathematics indicators in the Maine *Learning Results* (MLR): Parameters for Essential Instruction. Staff and leadership from RSU #54 (Skowhegan), RSU #11 (Gardiner), and Education Development Center, Inc. (EDC) will work collaboratively to develop, pilot, and implement state-wide a comprehensive package of professional development resources that are appropriate for use in person and from a distance synchronously or asynchronously. In addition, the professional development will foster the creation and ongoing use of a statewide mathematics learning network. This initiative will take full advantage of the potential of OER resources, combined with training and appropriate technological hardware, to support classroom technology integration that improve grades 7-12 student mathematics achievement and technological literacy. The initiative will focus on critical foundational skills for algebra in grades 7-12, including targeted rational number and key algebraic concepts. The resources and professional development will be responsive to district and state needs and appropriate research. Proposed indicators are listed in Table 1; selection of 6-8 indicators will be based on an analysis of district and state student achievement data, teacher classroom practice data from RSU #54 and RSU #11, and research on areas of student difficulty.

Table 1. Proposed Target Maine *Learning Results*: Parameters for Essential Instruction

D. Algebra	Symbols and Expressions	Equations and Inequalities	Functions and Relations
Performance Indicators Grade 8	1, 2	2, 3	4
Performance Indicators 9 - Diploma	1	2, 3	4, 5

A. Strategy, Action Plan & Timeline for Identifying Content Indicators & Prof. Development

RSU #54 and RSU #11 will share responsibility for development and piloting of resources. Currently RSU#54 high school teachers are further ahead in the implementation of OER in grades 9-12 mathematics, while in RSU#11 middle school teachers have more experience implementing OER in math than RSU#54 middle school teachers. Given this context, RSU#11 will lead the work with the resources and PD for the grades 7&8 strand, and RSU#54 teachers will pilot the grades 7&8 professional development. RSU#54 will lead the work with the resources and PD for the grades 9-diploma strand, and RSU#11 teachers will pilot the grades 9-12 professional development. EDC will support development and facilitation of the professional development. A timeline and details are included in Table 2.

Table 2: Strategy, Action Plan & Timeline for *Identifying Indicators & Prof. Development*

STRATEGY	ACTION PLAN		TIME LINE
	Grades 7&8 PD Strand Details (led by RSU#11)	Grades 9-Diploma Strand Details (led by RSU#54)	
Determine the specific MLR performance indicators based on local data and known areas of student difficulty; Teams communicate using LearnCentral.org	<p>Convene team of grades 7&8 teachers from both districts</p> <p>Collaboratively agree on 3-4 PEI grade 8 indicators based on analysis of data and research</p> <p>EDC supports data analysis and gathering of research for both strands</p>	<p>Convene team of grades 9-Diploma teachers from both districts</p> <p>Collaboratively agree on 3-4 PEI grades 9-diploma Algebra indicators based on data and research</p> <p>EDC supports data analysis and gathering of research for both strands</p>	Jan. 2010
Facilitate selection & documentation of lessons that have incorporated OER resources in math. (incl. GeoGebra)	<p>EDC creates PD forms and templates</p> <p>RSU#11 Grades 7&8 teachers and tech integrator select and refine lessons aligned to selected MLRs</p>	<p>EDC creates PD forms and templates</p> <p>RSU#54 Grades 9-12 teachers and tech integrator select and refine lessons aligned to selected MLRs</p>	Feb. 2010

Teachers in participating districts conduct model lessons to be videotaped & incorporated within in-person PD pilots	RSU#11 Gr. 7&8 teachers pilot lessons utilizing GeoGebra and other OER EDC & Tech integrator videotape lessons highlighting TPACK for PD Team revise resources for pilot PD in March	RSU#54 Gr. 9-12 teachers pilot lessons utilizing GeoGebra and other OER EDC & Tech integrator videotape lessons highlighting TPACK for PD Team revise resources for pilot PD in March	Feb. 2010
Pilot Face-to-Face Professional Development Model – 1 per grade span	EDC leads 1-day pilot PD (in-person) with RSU#54 teachers RSU#11 teacher co-facilitates	EDC leads 1-day pilot PD (in-person) with RSU#11 teachers RSU#54 teacher co-facilitates	Mar. 2010
Revise components of PD based on end of day evaluation and feedback from co-facilitators	RSU#11 grades 7&8 teachers refine lessons and supplementary resources Use LearnCentral.org to collect and share feedback	RSU#54 grades 9-12 teachers refine lessons and supplementary resources Use LearnCentral.org to collect and share feedback	Apr.-May. 2010

Conduct model lessons w/ summer school students to improve student achievement while capturing student video & work for synchronous & asynchronous PD	Administer pre-assessment items from pre-piloted lessons Conduct OER lessons Administer post-assessment items from lessons Record lessons & student explanations to enhance PD	Administer pre-assessment items from pre-piloted lessons Conduct OER lessons Administer post-assessment items from lessons Record lessons & student explanations to enhance PD	June-July 2010
Select online components for synchronous PD	Review video of face-to-face (include teacher Q&A) Prepare online resources	Review video of face-to-face (include teacher Q&A) Prepare online resources	Aug. 2010
Facilitate synchronous PD for uninvolved teachers in participating districts and open to teachers statewide	Advertise PD statewide through state, local avenues (MLTI, LearnCentral.org) EDC & RSU#11 teachers co-facilitate session (s) Record PD (including webinars) for later use	Advertise PD statewide through state, local avenues (MLTI, LearnCentral.org) EDC & RSU#54 teachers co-facilitate session (s) Record PD (including webinars) for later use	Sept. 2010
Bridge PD to Practice	Participating teachers: Administer pre-assessment items to students Conduct selected lesson(s) Administer post-assessment items to students	Participating teachers: Administer pre-assessment items to students Conduct selected lesson(s) Administer post-assessment items to students	Sept. 2010 – Apr. 2011

All resources from face-to-face and synchronous PD for asynchronous use	Upload resources to web for statewide access, incorporating archived PD webinars & resources	Upload resources to web for statewide access, incorporating archived PD webinars & resources	Oct. 2010
Utilize LearnCentral.com to build an ongoing community of practice	Post questions about implementation & network with other educators relative to PD & resources Post additional resources	Post questions about implementation & network with other educators relative to PD & resources Post additional resources	Nov. 2010– June. 2011

B. Capacity Statement

Staff and leadership from RSU #54 (Skowhegan), RSU #11 (Gardiner), and EDC have extensive experience in the creation and facilitation of professional development, particularly in the area of technology integration for learning and teaching. Technology integration specialists in RSU#54, Laura Richter and Dorothy Small, have led numerous initiatives and won awards for their work with teachers and students in the integration of technology in teaching and learning. RSU#11 Technology Director Terry McGuire and technology integration specialist Lisa Foster have conducted technology integration institutes each summer for many years. Dr. Pamela Buffington of EDC has led professional development design and facilitation throughout Maine and the Northeast. She was the Project Director for the professional development component of the *Maine Impact Study of Technology in Mathematics*, PI of two math science partnerships that incorporate formative assessment and technology in mathematics (*RBAMM* at the middle level and *Access-IT* at the high school level), led *SELECT Math* with the Office of Instructional Technology in Boston, and supported mathematics teachers with technology integration in mathematics with MLTI, among many other projects. See the following websites for sample projects and evidence of capacity: Skowhegan Area Middle School HYPERLINK "<http://www.msad54.org/sams/>" <http://www.msad54.org/sams/> , Skowhegan Area High School HYPERLINK "<http://www.msad54.org/sahs/>" <http://www.msad54.org/sahs/> , RSU#11 HYPERLINK "<http://www.msad11.org/>" <http://www.msad11.org/> , EDC Maine HYPERLINK "<http://maine.edc.org/>" <http://maine.edc.org/> , EDC Newton HYPERLINK "<http://www.edc.org/>" <http://www.edc.org/> and MISTM HYPERLINK "<http://www2.edc.org/mistm/product/>" <http://www2.edc.org/mistm/product/>.

C. Strategy, Action Plan & Timeline for Ongoing Learning Network

Project partners plan to further develop an on-going statewide content area learning network through multiple avenues in order to ensure that a broad range of stakeholders

across Maine and the nation can capitalize on the use of the developed resources. The project will also ensure that the networks can support and encourage further dialogue and OER development through established and underdeveloped forums. (See Table 3 below.)

Table 3: Strategy, Action Plan & Timeline for Ongoing Learning Network

STRATEGY	ACTION PLAN	TIME
Build capacity for participating district staff and educators across Maine to utilize and extend use of online learning environments for synchronous and asynchronous collaboration	Conduct PD relevant to the use of LearnCentral.org for all mathematics staff in the participating districts in the grant. Utilize LearnCentral.org for networking, brainstorming, critiquing and sharing resources relevant to the development and refinement of the PD model Post information about LearnCentral.org in the existing environments in the participating districts, (e.g. post links and support documents in Studywiz in RSU#11 and in Moodle in RSU#54) to broaden exposure to environments Provide access to links and resources for other sites used for educator collaboration (MLTI, EDC Maine, & others)	Jan 2010-grant end

D. Alignment with SAU Learning Goals (See state technology plans)

Both SAU#54 and SAU#11 have identified improvement in math instruction, toward ultimately improving student achievement, as a district goal. Both districts have clearly articulated goals and objectives in their technology plans linking enhanced learning and teaching to the integration of technology for the purpose of improved student achievement. The targeted professional development of mathematics teachers in this grant focuses directly on locally identified needs.

E. Parent/Guardian and Community Involvement

A critical component to student success is involvement of parents/guardians and community members in the educational process. As technology permeates all aspects of society, it is critical that they understand the advantages, opportunities, and responsibilities of technology supported learning and teaching. Table 4 outlines the plan and timeline for involving community members.

Table 4: Strategy, Action Plan & Timeline for Community Involvement

STRATEGY	ACTION PLAN	TIME
Communicate the importance of technology integration in learning and teaching through multiple media and events	Post information about the grant on parent and community links on the participating district websites Provide links to an explanation of OER and sample resources from the participating district websites Post sample lesson videos after the face-to-face pilots Send out informational letters about the summer school opportunity for students to engage with technology Host fall parent night after synchronous resources are created. Involve students in the demo of resources.	Jan 2010 Mar 2010 June 2010 Sept 2010

F. Training & Development Quality Standards

The following Table explains grant connection to Training and Development Quality Standards.

Table 5. Project Alignment to Training and Development Quality Standards

Quality Standard #1 - Continuously Improve

Alignment to Project

Local and state data used to inform MLR indicators. Participant & co-facilitator feedback used to refine and revise PD for continuous improvement cycle. Student pre-post data used to refine model lessons in the PD & measure improved student achievement.

Data: local, MEA, NWEA

Administrator and teacher leadership

Participation by all across the stages of the project

Pre/Post assessments /surveys

Quality Standard #2 - Focus on Results

Alignment to Project

Incorporated adult learning principles, student performance, and improvement of the training and PD system based on theory. Variety of formats such as face-to-face sessions, workshops, individual and teamwork, synchronous and asynchronous, and learning networks. Each goal and step of the process is evaluated. Evaluation assesses short and long-term impacts.

TPCK approach, content focused, embedded and tested in practice, focused on student needs

Workshops, study teams, classroom implementation, development / refinement of PD modules informed by student results

Evaluation plan: goals and outcomes

Quality Standard #3 – Organ Alignment

Alignment to Project

Training and development plans are referenced and coordinated with other school system planning. Time for training and development is identified in the plan. Budget process supports the training and development plan.

Teacher, technology integrator, & leadership roles incorporated

Budget justification

Open source material (no cost access)

Quality Standard #4 - Use of Research Data

Alignment to Project

G. Evaluation:

The evaluation of the grant will be multi-tiered and include educator and student components. The staged development process of the in-person, synchronous, and asynchronous professional development will incorporate various formative assessments to be used in the revision and refinement process. The in-person pilots will be conducted in March. Participants of the in-person sessions will be asked to complete an online survey prior to the in-person training. They will also be asked to complete an end of day survey at the training and a follow-up survey two weeks after the training is complete, once they have the opportunity to return to the classroom and apply the PD to practice. This pre-post evaluation process will be applied to each PD format. Pre and post assessment items will be administered to students that participate in the OER embedded lessons. A project logic model has been developed to map the pre-treatment context to the PD intervention to the teacher process outcomes to the student achievement outcomes.