

Digital Libraries go to School External Evaluation Overview

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Section 1) Summative Annual Report

1) Total Impact of grant activities

- Document the workshops that were conducted
- Participant segmentation (rural/urban, subjects and grade levels, pre/in-service, trainers)

Method: This will be accomplished via interviews with IA team, participants, and document analysis.

The IA team will provide a list of workshops conducted and participant data collected.

2) Use of formative evaluation data

- IA functionality changes
- Workshop model changes

Method: This will be accomplished via interviews with IA team and document analysis.

The IA team will provide IA functional specifications and workshop curriculum with histories of their adaptation to feedback.

3) Fidelity of implementation

- Verify that activities are as described in the grant
 - Conduct quasi experimental study
 - Develop quality assessment rubric
 - Conduct workshops
 - Create teacher development/design model
 - Contribute STEM resources to NSDL
 - Conduct cross-disciplinary review of resources
 - Internal evaluation/research activities
 - Documenting: impact on teacher practice, capacity for designing learning activities, use of online resources, increased STEM content knowledge. This should include a general review of methods (observations, surveys, interviews, web-metrics, artifact analysis) and their fit to the research questions being asked.

Method: This will be accomplished via interviews with IA team, workshop participants, and document analysis.

The IA team will provide the quality rubric and a history of its development/use, the teacher resource development and enactment model and a history of its development/use, all surveys and protocols used for evaluation and dissertations.

4) Accomplishment of objectives

- Was the IA team able to answer the evaluation questions?
- Were outcomes from activities (fidelity) as anticipated in the logic model

Method: This will be accomplished via interviews with IA team and document analysis.

The IA team will provide internal evaluation findings, dissertation findings, and the logic model.

5) Confirmation of participant value assumptions

- Did participants get what they expected and needed from the workshops

Method: This will be accomplished via phone interviews with a stratified random sample of workshop participants.

Section 2) Review project materials and communication

End of years one and two: review all surveys and protocols used in light of research questions they were intended to answer. Assess the face validity and actual effectiveness of these instruments.

Method: Document analysis and interviews with IA team.

The IA team will provide copies of workshop curriculum and survey instruments and protocols.

Section 3) Evaluate the content assessment rubric

Evaluate the method of development of the rubric (literature review and iterative refinement from use) and the effectiveness of the rubric for assessing online resource quality.

Method: Use of the rubric, document analysis.

The IA team will provide the content assessment rubric and the literature from which it was gleaned.

Section 4) Evaluate the teacher/content development model

Dr. Janke and Dr. Lawless will review the resource development model and the workshop curriculum to verify that the workshop is sensitive to assumptions about how activities using online resources are designed and implemented in the classroom.

Section 5) Supporting Materials from the Grant Proposal

Grant Objectives and Anticipated Outcomes

1. Design and implement a teacher development model:
 - Pre-/in-service teachers increase their capacity for designing learning activities.
2. Design and implement a STEM content development model:
 - Pre-/in-service teachers increase their capacity for using NSDL and other online resources as building blocks for teacher-created STEM content and assessments.
3. Contribute teacher-designed learning activities to NSDL:
 - Rubrics developed for assessing teacher-created content
 - Model developed for engaging cross-disciplinary review team (experts and teachers) to assess teacher-created content for inclusion in NSDL and elsewhere.
 - Context around NSDL resources extended with metadata on pedagogy and quality
4. Use evaluation and research to measure impact on teaching:
 - Research instruments adapted or developed for documenting impact on teacher practice, capacity for designing learning activities, use of online (particularly NSDL) resources, and increased STEM content knowledge.

The following tables (1, 2, and 3) come from the NSF grant proposal

Table 1. Project Evaluation Questions

<i>Objectives / Evaluation Questions</i>	<i>Measures</i>
<i>1&2: Teacher and content development model</i>	
What variables influence use and perceived utility of the program?	<ul style="list-style-type: none"> - Participant Pre/post surveys, interviews, and classroom observations. - Webmetrics. - Quasi-experimental study (Utah) - Document analysis
How are teachers using online resources?	
What kinds of artifacts are workshop participants creating?	
How are the teacher and content development models working (pedagogy and content)?	
<i>3: Contribution of content to NSDL</i>	
What is the quality of rubric?	<ul style="list-style-type: none"> - Interviews with RC - Measure number of projects contributed to NSDL
How easy is it to apply to the evaluation of teacher projects?	
<i>Secondary objectives</i>	
Does the program result in increased technology integration?	<ul style="list-style-type: none"> - Participant pre/post classroom observations and interviews.
Does the program have impact on content knowledge?	

Table 2. Timeline of Project Evaluation Activities

<i>Objectives / Evaluation Activities</i>	<i>Leads</i>	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<i>1&2: Teacher and content development model</i>		2	0	0	6	2	0	0	7
Evaluate in-service teacher technology and design-based pedagogy skills pre/post program	MR, GS, SG								
Evaluate teacher in-class use of STEM resources	MR, GS								
Evaluate pre-service teacher technology and design-based pedagogy skills pre/post curriculum	RJ, MR, GS								
Evaluate support structure	MR, SVG, GS								
Evaluate effectiveness of teacher/content development model	KL, RJ								
<i>3: Contribution of content to NSDL</i>									
Evaluate teacher-created content	RC								
Evaluate the content assessment rubric	KL								
<i>Secondary Objectives</i>									
Review project materials and communication	KL								
Write summative report	KL								
Identify scalable features of the pilot	USU, CI, SUNY								
*Q=quarter; Q1=Jan-Mar, Q2=Apr-June, etc.									

USU: Mimi Recker (MR), Grad Student (GS); *CI*: Sarah Giersch-SG, Susan Van Gundy (SVG); *SUNY Cortland*: Rena Janke (RJ); External evaluator, Kim Lawless (KL); Review Committee (RC)

Table 3. Proposed Quantitative & Qualitative Evaluation Measures

Proposed Quantitative & Qualitative Evaluation Measures

Pre- and post- **online surveys** will be developed to assess:

- Demographic and professional experience data;
- Current technology infrastructure at the school where they teach (if applicable);
- Prior participation in professional development;
- Their use of technology in instruction on a daily basis (if applicable) and at home;
- Attitudes towards and knowledge of technology.

Open and lickert-scale items will be selected from previously developed and tested surveys (Becker, 2000; Recker et al., 2005). Surveys samples can be accessed at dlconnect.usu.edu.

A random sample of participants will be involved in pre- and post- **interviews and classroom observations**. Rubrics will be developed to assess:

- Teacher design of learning activities and use of online resources;
- Barriers and enablers;
- Use of and attitudes towards program support structures;
- Pre and post program general integration of technology in instructional activities;
- Self-reported impact on STEM content knowledge.

Webmetrics analyses will be conducted to assess:

- Creation and use of Instructional Architect projects;
- Use of online resources;
- Quality of resulting projects.

Overall Logic Model

Existing Conditions & Assumptions	Program Objectives	Program Activities	Program Outcomes
<p>There is widespread availability of online resources in digital libraries. These resources can promote:</p> <ul style="list-style-type: none"> • teacher content knowledge • student learning <p>It is seldom the case that teachers/learners will use technologies seamlessly: Limited use by teachers.</p> <p>Lit. review found that bad tech.-focused PD is prevalent</p>	<p>Help teachers learn to use NSDL resources in ways that meaningfully affect their practice in STEM content:</p>	<p>Conduct high-quality PBL-informed professional development for rural in-service and pre-service middle & high school math & science teachers of underserved populations.</p> <p>Peer/expert support network to provide follow-up after workshops, both online and face-to-face.</p>	<p>Teachers maximize their existing design capacity in their own local context with high quality resources.</p> <p>The PD model will be improved by our understanding of teacher design practice.</p>
<p>Teachers have ultimate control in the classroom; they act as designers who adapt resources to fit local needs, contexts, and curricular standards.</p> <p>Online resources are catalysts to build locally relevant instruction. Affordances that enable/constrain design.</p> <p>Little is known about how teachers view their role: design and reuse.</p>	<p>Explicate teachers' tacit design capacity and assumptions about online resources.</p> <p>Help teachers increase their design capacity by using NSDL and other online STEM resources as building blocks for teacher-created content and assessments.</p>	<p>Phase 1: We conduct research to reveal individual, contextual, and resource factors that affect teacher design capacity.</p> <p>Phase 2: Integrate design curriculum into professional development model (workshop session 2) that utilizes components of PBL.</p>	<p>Educators, technology trainers, and resource creators and administrators will:</p> <ol style="list-style-type: none"> 1) Make better design choices. 2) Understand factors that affect design: resource content, granularity, and metadata.
NSDL: over 1 million	Contribute teacher-	Phase 1: Develop a	Teachers produce

<p>resources from 480 collections. Teachers have created little of that content despite the fact teachers want other teacher-created content.</p>	<p>designed learning activities to NSDL.</p>	<p>quality assessment and metadata tagging rubric.</p> <p>Phase 2: Review teacher created resources: Review Committee (RC) uses content review rubric.</p>	<p>vetted content relevant to standards that can be shared for reuse through NSDL.</p> <p>As the rubric matures, it will be used to inform prescriptions for resource design.</p>
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Evaluation Logic Model

Research and Evaluation Objectives	Research Questions	Methods and Data
<p>Measure workshop impact on teachers' effective technology integration.</p> <p>Title II D: Enhancing Education Through Technology (EETT) of the No Child Left Behind Act (NCLB).</p>	<p>What is effective integration of educational technology, and how does it happen?</p> <p>Are teachers more likely to integrate educational technology in an effective way after the workshops?</p>	<ul style="list-style-type: none"> - Participant pre/post surveys - Classroom observations - Interviews - Webmetrics. - Quasi-experimental study (Utah). - Document/artifact analysis
<p>Measure impact on teachers' technology experience, attitudes, and knowledge about online resources and libraries.</p>	<p>How are teachers' knowledge and skills changed by use of these technologies and resources?</p>	<ul style="list-style-type: none"> - Participant pre/post surveys - Interviews - Classroom observations. - Webmetrics. - Quasi-experimental study (Utah) - Document/artifact analysis
<p>Improve the IA, the workshop model, and the NSDL.</p>	<p>How can the work of technology trainers (e.g. the workshop model) and resource developers (e.g. NSDL contributors) better serve the needs of educators?</p>	<ul style="list-style-type: none"> - Participant pre/post surveys. - - Interviews. Document/artifact analysis.
<p>Create a resource quality/usability rubric.</p>	<p>What is the validity (e.g. face and content) and reliability (e.g. inter-rater and intra-rater) of the rubric?</p> <p>How easy is it to apply to the evaluation of teacher projects?</p> <p>What is the quality of the resulting metadata tagging of vetted resources?</p>	<ul style="list-style-type: none"> - Interviews with RC and digital library vetting team. - Measure number of projects contributed to NSDL. - Literature review.
<p>Research a model of teachers' tacit design capacity sensitive to</p>	<p>How do teachers view their roles in adapting, designing, and reusing</p>	<ul style="list-style-type: none"> - Participant Pre/post surveys - Interviews

<p>different resources, teachers, and contexts.</p> <p>Measure impact of workshops and support networks on teacher design capacity.</p>	<p>learning objects?</p> <p>What variables (e.g. granularity of resources, teacher experience and comfort with STEM content) influence use and perceived utility of the program?</p> <p>How are teachers using online resources?</p> <p>What kinds of artifacts are workshop participants creating?</p> <p>How are the teacher and content development models working (pedagogy and content)?</p>	<ul style="list-style-type: none"> - Classroom observations. - Webmetrics. - Quasi-experimental study (Utah). - Document/artifact analysis. - Literature review.
<p>Measure impact on teachers' STEM content knowledge from use of NSDL.</p>	<p>What role do online resources have in supporting increased content knowledge?</p> <p>How are teachers' knowledge and skills changed by use of these technologies and resources?</p>	<ul style="list-style-type: none"> - Participant pre/post classroom observations and interviews.
<p>Measure impact on students' STEM content knowledge and attitudes from consumption of teacher-designed resources.</p>	<p>How have the self-reported knowledge and skills of students changed?</p> <p>How have the self-reported attitudes of students changed?</p>	<ul style="list-style-type: none"> -Student pre/post classroom observations and interviews. -Pre/post survey of student self-reported attitudes about and levels of knowledge in relevant content area. -Quasi-experimental design (Utah).