Instructional Architect, DLConnect, and Digital Libraries go to School Evaluation Overview

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Background

This evaluation retrospective covers the period from 2001-2006. During this period the project first focused on developing a National Science Digital Library (NSDL) web-based service, the Instructional Architect (IA.usu.edu), and then on disseminating it in school contexts via both formal in informal pre-service and in-service teacher professional development opportunities.

Early evaluation efforts (2001-2002) focused on needs assessment and interface design and development for the IA. This phase can be referred to as developmental evaluation, with the internal evaluation tied very closely to ongoing program activities, providing real-time formative feedback.

Participants included graduate students in Instructional Technology, pre-service teachers, and expert teachers. Methods included literature reviews, focus group interviews, and feedback on mockups for the IA user interface. Early recommendations included a search tool, a combination tool, and a reflection tool.

In addition a more in-depth case study approach was conducted with 8 in-service teachers in Utah. They provided input on how Internet resources were currently used in their teaching practice, and contributed to the needs assessment.

In 2003, an extensive redesign of the IA was undertaken which also required feedback from users which was obtained from interviews, focus groups, and surveys.

Also in 2003, we began to develop teacher professional development curricula to help disseminate the NSDL and the IA. In this phase, data was collected from group interviews and a key informant interview, as well as from pre and post-surveys (paper-based) including open and close-ended items. The survey also included items from a well-known teacher survey developed by Becker. Participants included pre-service and in-service teachers, and school library media specialists.

Evaluation findings were analyzed in terms of implications for current and future IA programs, product upgrades, and evaluations, specifically:

1) The impact of IA curriculum on participants in terms of their knowledge, attitudes, and competency using digital resources and IA.
2) Feedback from participants about how the IA curriculum could be improved.
3) Feedback from participants about how IA itself could be improved.
4) Feedback from participants about how the evaluation and instruments used could be improved (participatory evaluation).

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As part of this phase, we began to develop a program theory documenting program inputs and anticipated outputs.

In 2004/5, we began a more systematic implementation of teacher professional development workshops, including face-to-face and online versions. Evaluation and research efforts were expanded to include webmetrics analyses of usage. Also during this period, we developed and began using an online survey instrument. Additional evaluation data on the effectiveness of the professional development model included key informant interviews, workshop observations, participant reflection papers, and focus group interviews.

In 2006, we developed a logic model for our program, which explicated program assumptions, inputs, mediators, and anticipated outputs.

Overview of Ongoing Internal Evaluation

One of the key program objectives is to use evaluation and research to measure impact on teaching. These efforts are underpinned by several ongoing efforts:

- Adapting and developing instruments for documenting impact on teacher practice, capacity for designing learning activities, use of online (particularly NSDL) resources, and increased STEM content knowledge.
- Tracking program impact in terms of audiences reached.

The internal evaluation has both formative and summative components, focused in three main areas:

- Assessing the merit of the program in terms of impact on teacher knowledge, attitudes, and behavior in the classroom with digital resources and the IA authoring tool.
- Contributing to program and product improvement. Program improvement has been operationalized into developing and measuring the effectiveness of the distributed professional development model. Product improvement has focused of the functionality of the IA.
- Annual reporting to the NSF.

Overview of Ongoing External Evaluation

The external evaluation has several key goals, including:

- Producing a summative annual report summarizing the total impact of grant activities in terms of: participants; the program's use of formative evaluation; the fidelity of the program implementation; accomplishment of grant objectives; and confirming that participant value assumptions were met by the program.
- Reviewing project materials and communication at the end of years one and two.
- Evaluating the content assessment rubric.
- Evaluating the teacher/content development model

Ongoing and past evaluation efforts are documented in the following publications

Dorward, J., Reinke, D., & Recker, M. (2002). An Evaluation Model for a Digital Library. In *Proceedings of Joint Conference of Digital Libraries* (pp. 322-323). New York: ACM.

Recker, M., Dorward, J., Dawson, D., Halioris, S., Liu, Y., Mao, X., et al. (2005). You Can Lead a Horse to Water: Teacher Development and Use of Digital Library Resources. In *Proceedings of the Joint Conference on Digital Libraries* (pp. 1-9). NY, NY: ACM.

Recker, M., Dorward, J., Dawson, D., Liu, Y., Mao, X., Palmer, B., et al. (2006). Teaching, Creating, Sharing: A Context for Learning Objects. *Interdisciplinary Journal of Knowledge and Learning Objects, 1*, 197-216.

Recker, M., Dorward, J., & Nelson, L. (2004). Discovery and use of online learning resources: case study findings. *Educational Technology & Society, 7*(2).

Recker, M., Dorward, J., & Reinke, D. (2003). Development and Evaluation of Digital Library Services: Theory and Practice. In M. Mardis (Ed.), *K12 Digital Libraries* (pp. 107-119). Syracuse: ERIC.

Recker, M., & Palmer, B. (2006). Using Content Across Digital Libraries. In *Proceedings of the Joint Conference on Digital Libraries* (pp. 241-242). NY, NY: ACM.

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