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Professional Development for Florida Digital Educators: Implementation and Evaluation

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Abstract

The Florida Digital Educator (FDE) Program is a Florida Department of Education initiative that supports the integration of technology across the K-12 curricula through collaborative experiences with new technologies and digital tools. This paper provides findings from the first year implementation (2006-2007) of the FDE training program, which included a four-day summer institute and follow-up activities for the subsequent academic year. Results from pre- and post-institute surveys, end-of -year surveys, participant questionnaires, and interviews indicate that the FDE program has been very successful. This paper is organized around the research data collected during the implementation of the professional development model, focusing on significant changes over time.

Keywords: laptops, digital tools, professional development, research, technology integration.

Assessment Professional Development for Florida Digital Educators: Implementation and Evaluation

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Introduction

The state of Florida and the school districts within Florida have invested significant resources into supporting teachers to effectively integrate the latest technology into their current teaching practices. In addition to the necessary resources and support, professional development is one of the essential conditions for the effective integration of technology into the curriculum (Adelman, Donnelly, Dove, Tiffany-Morales, Wayne, & Zucker, 2002; ISTE, 2006; Lemke, Wainer, & Haning, 2006; Ringstaff & Kelley, 2002; SETDA, 2006; TSSA Collaborative; 2001). Effective professional development includes evaluation to assure that the training is meeting the specific needs of the participants (Rodrigues, & Knuth, 2000).

The data from a statewide Florida Innovates Survey revealed that Florida teachers have few professional development opportunities related to technology (Bureau of Instruction and Innovation, Florida Department of Education, 2007). Therefore, the Florida Department of Education led an initiative to design a sustainable professional development program that could be implemented in Florida in an efficient, effective manner. After reviewing the literature related to professional development for technology integration and other professional development models, the Florida Department of Education worked with content specialists and instructional technologists to outline a new model. This model, titled the Florida Digital Educator program, was designed to support the integration of technology across the K-12 curricula through collaborative experiences with new technologies and digital tools. The model incorporated master teachers; mentors; intensive, hands-on institutes; and follow-up activities. A list of attributes that typify the profile of a “digital educator” was generated and formed the basis for the outcomes of the program.

Research Questions

1. Were there significant changes in participants’ perceptions and practice related to technology integration between the pre-institute survey, post-institute survey, and end-of-year survey?
2. Were there significant changes in participants’ perceptions of their abilities and practices related to digital educator attributes between the pre-institute survey, post-institute survey, and end-of-year survey?
3. What were the participants’ perceptions of the primary barriers to technology integration?
4. What were the participants’ impressions of the Florida Digital Educator program?

Theoretical Framework

The Florida Digital Educator program was developed based on research related to professional development and instructional technology. The theoretical framework includes experiential learning, adult learning theory, and project-based learning.

According to Rogers (1969) and Rogers & Freiberg (1994), experiential learning is characterized by willing learners who participate in the learning process and contribute to the nature and direction of the training. Hands-on activities that are relevant to learners' personal interests along with support of scaffolding and choice in their learning environment are also important elements of this tenet.

Adult learning theory (Cross, 1981; Knowles, 1984) suggests that adults learn better if their experience is capitalized and the instruction is immediately applicable to their job or personal life. Adult learners need to discover things for themselves and be provided guidance when they make mistakes. Providing different levels or types of experiences should accommodate the differences in the background of the learners.

With its roots based on the constructivist learning theory (Brunner, 1966, 1996), project-based learning is student-directed learning where the learner has decision-making power and the teacher/trainer plays the role of facilitator (Blumenfeld, Soloway, Marx, Krajcik, Guzdial & Palincsa, 1991; Katz & Chard, 1989; Means & Olson, 1997). Project-based learning also requires that the project take place over an extended period of time and have connections to real world experiences.

Research Methods

Participants

A total of 475 participants attended six different technology institutes throughout Florida during the summer of 2006. Nineteen school districts were represented; including districts from urban, suburban, and rural areas. The participants came from diverse backgrounds, varied levels of expertise with technology, and different subject areas and public school positions. Participants consisted of middle school teachers (31%), elementary teachers (28%), instructional technology specialists (22%), high school teachers (17 %), and administrators (2%).

Treatment

A total of six different technology institutes were offered throughout Florida, with sessions that focused on Podcasting, Digital Video, Digital Storytelling, Graphic Organizers, Digital Audio, and Digital Images. The sessions were designed to emphasize hands-on activities (each participant brought or was provided a laptop), group collaboration, and authentic project-based learning. All of the summer institutes followed the same basic structure:

Day 1 - Check-in, pre-institute survey, welcoming presentation, two concurrent sessions, and collaborative projects.

Day 2 - Four concurrent sessions with each focused on a different technologies or techniques.

Day 3 - Whole group session on global connections, followed by collaborative work on group project.

Day 4 - Group project presentations, action research, e-portfolios, and post-institute survey.

The Instruments

Pre-Survey. On the first day of the institute, participants were asked to participate in a survey, titled *Perceptions of Computers & Technology*. Sections included participants' level of confidence, skill, support, and uses of computers and technology in teaching. The Cronbach's alpha score for the reliability of the survey was found to be strong ($\alpha = .975$, $CI_{95} .971$ to $.980$).

Post-Survey. At the end of the institute, participants took a post-survey that included nine identical statements from the Confidence and Comfort Using Technology section of *Perceptions of Computers & Technology* survey. Of the 475 participants, 221 voluntarily completed both the pre- and post- survey. Cronbach's alpha was computed for the scores for the nine statements during the pre-survey ($\alpha = .915$, $CI_{95} .897$ to $.931$) and again with the post-survey at the end of the summer institute ($\alpha = .914$, $CI_{95} .896$ to $.930$).

Year-End Survey. After the participants had time to implement technology during the school year, they were asked to take the *Perceptions of Computers & Technology* survey again as a repeated measure. This survey also included four open-ended questions to ascertain the most valuable lessons from the FDE program, the barriers to implementing technology in the classroom, avenues through which their knowledge and skills were shared, and suggestions for improvement of the program.

The Interview Protocol. Randomly selected participants took part in a brief confidential interview with a researcher. Fifty-four (Male = 16, Female = 38) took part in the interviews. The interview protocol focused on participants' background and goals, their beliefs about the impact the institutes might have on their school/district and students, and their impressions of the six workshop sessions they attended.

Post-institute Questionnaire. At the first, fifth, and sixth institutes, the participants were asked to complete an End-of- Institute Questionnaire. Participants (N=218) responded to four questions related to their experiences during the institute.

Open-Ended Comments in Year-End Survey. The responses of the four open-ended questions were analyzed qualitatively.

Results

The questionnaire, interviews, and open-ended comments were analyzed with a qualitative approach, and the data from the surveys were analyzed quantitatively, with a statistical software package.

Survey Results: Significant Overall Changes in Teachers' Perceptions

Participants of the FDE summer institutes responded to the same survey, *Perceptions of Computers & Technology*, in the beginning of the summer institute and again at the end of the school year. Because the demographics of the respondents for the pre-institute and the year-end surveys were very similar, both sets of data were used to examine the changes in perceptions and practice that occurred between these time periods.

As illustrated in Table 1, significant changes were noted for every one of these major areas between the pre-institute and year-end surveys. All significant changes in the mean scores were in the positive direction.

In order to gain a better understanding of where the changes took place, some of the major sections were broken into subscales through exploratory factor analysis and then analyzed at the subscale level for significance.

Table 1. *Significant Changes in Perceptions of Computers & Technology Scales between Pre-Institute and Year-End Surveys*

Scale and Subscale	Pre	Year-End	Change	DF	t Value	Pr > t	
Confidence and Comfort with Computers	3.95	4.28	0.34	120	3.77	0.0003	**
Comfort with Computers	3.70	4.18	0.49	120	4.69	<.0001	**
Belief	4.45	4.52	0.06	120	0.78	0.4388	
General School Support	3.73	3.99	0.26	118	2.93	0.0041	**
Integration of Technology	3.14	3.40	0.26	113	2.75	0.0069	**
Learning of Groups of Students	3.01	3.28	0.27	113	2.15	0.0335	*
Learning of Individual Students	2.98	3.19	0.21	113	1.74	0.0844	
Teacher Instructional Activities	3.42	3.72	0.31	113	2.78	0.0064	**
Teacher Software Use	2.48	2.66	0.18	117	2.34	0.0207	*
Teachers Use Advanced Production SW	1.91	2.18	0.27	117	2.97	0.0036	**
Teachers Use Content Delivery SW	2.11	2.26	0.15	117	1.25	0.2131	
Teachers Use Office SW	3.56	3.65	0.09	117	1.00	0.3217	
Student Software Use	2.03	2.20	0.17	112	2.15	0.0338	*
Students Use Advanced Production SW	1.58	1.74	0.16	112	2.02	0.0461	*
Students Use Content Delivery	2.28	2.33	0.05	112	0.36	0.7183	

Table 1. *Significant Changes in Perceptions of Computers & Technology Scales between Pre-Institute and Year-End Surveys*

Scale and Subscale	Pre	Year-End	Change	DF	t Value	Pr > t	
SW							
Students Use Office SW	2.66	2.99	0.32	112	2.59	0.011	*
Digital Educator Instruction	2.86	3.57	0.71	115	5.60	<.0001	**
Digital Educator Leadership	2.73	3.35	0.62	113	4.79	<.0001	**
Digital Educator Classroom	2.65	3.30	0.65	114	4.68	<.0001	**

*p<.05

**p<.01

Key Findings: Significant Changes in Perceptions and Practice

Following a four-day training workshop, teachers reported significant increases in their levels of confidence and comfort using technology. In particular, participants felt significantly better prepared to integrate technology in their classrooms, assign multimedia projects, and create rubrics to assess multimedia projects.

Teachers who participated in the Florida Digital Educator program increased their use of software for instruction. There was a notable growth in the frequency with which teachers used video editing, concept mapping, graphics programs, and presentation software for instruction.

By the end of the academic year, Florida Digital Educators reported integrating significantly more technology into their instructional practices. Significant increases were noted in the frequency of using technology for a wide array of instructional practices (such as presentation, assessment, and communication).

By the end of the academic year, Florida Digital Educators reported significant changes in their classroom pedagogy. Significant increases were noted in the frequency of implementing technology via individualized instruction, cooperative groups, and as a problem solving/decision making tool.

Over time, students in classrooms taught by a Florida Digital Educator used a wider range of software as tools for learning. Increased student use of video editing, concept mapping, presentation software, web browsers, and word processors were noted.

Participants in the Florida Digital Educators program perceived a significant increase in school support. By the end of the academic year, educators became aware of increases in their access to computers, software, and the Internet.

Key Findings: Significant Changes in Digital Educators' Attributes

Participants in the FDE program perceived significant changes in their level of expertise related to the instructional attributes of a digital educator. Increased leveraging of technology

for student learning, a 21st century curriculum, and authentic assessment were noted by the participants.

Participants in the FDE program perceived significant changes in their level of expertise related to leadership roles in the support of technology integration. Perceptions related to using technologies to communicate with the community, conduct data-driven decision making, and enrich professional development were all increased.

Participants in the FDE program perceived significant changes in their level of expertise related to implementing technology in the classroom. Increased comfort was noted related to implementing activities wherein students can construct knowledge, collaborate with peers, engage in substantive conversation, communicate conceptual understanding, and communicate with a global audience.

Findings: Participant Dialogue

In addition to the selected response items in the *Perceptions of Computer & Technology* survey, participants provided constructed responses to open-ended questions, as well as voiced their opinions via interviews.

Key Findings from Participant Dialog

Participants in the Florida Digital Educator program supported their peers in technology integration initiatives. While participating in the FDE program, 97% of the educators reported actively sharing their knowledge and skills related to technology with their peers through workshops, mentoring activities, and resources.

Almost all participants reported a positive experience with the Florida Digital Educator program. Ninety-eight percent of the respondents to the end-of-the-school-year survey reported a positive experience with the Florida Digital Educator program.

Access to software and hardware in the classroom continues to be a barrier for technology integration. Forty-one percent of the respondents to the year-end survey noted lack of hardware and/or connectivity as the major barrier to technology integration.

Time to prepare and implement technology lessons is a major barrier to technology integration. Thirty-seven percent of the respondents to the year-end survey noted that time was the major barrier to technology integration in their classroom.

Discussion

The results of this evaluation of the first year implementation of the Florida Digital Educator program are very positive. The design and implementation of the program produced significant changes in numerous factors related to technology integration.

Integrating Technology as a Curricular Tool

The major goal of the Florida Digital Educator program is to prepare 21st century teachers – teachers who can design curriculum wherein technology is used by students as a tool to gather, organize, and analyze data; solve problems; and construct knowledge (Means, Blando, Olson, & Middleton, 1993). However, before technology can become a critical element of the curriculum process, teachers must possess the knowledge and skills needed to design optimal student activities (Sandholtz, Ringstaff, & Dwyer, 1997; Silverstein, Frechtling, & Miyoaka, 2000). Based on a study by SRI International, professional development activities can have a positive impact on teachers' use of educational technology:

Both formal and informal forms of professional development in educational technology appear to influence teachers and their classroom practice. The number of professional development activities experienced, the degree to which the activities were aligned with research-based features of high-quality professional development, and a focus on integrating technology into teaching appear to exert positive effects on whether or not teachers use technology during instruction (Adelman et al, 2002, p. 5).

The structure of the FDE program provides both formal (summer institutes) and informal (follow-up activities and mentoring) forms of professional development. In addition, research and practice related to adult learning principles, experiential learning, and project-based learning were used to frame the curriculum and are woven throughout the program's activities. The FDE program is solidly focused on the integration of technology, as a learning tool, to improve teaching and learning.

Impact of Florida Digital Educator Professional Educator Program

Findings from the evaluation of the Florida Digital Educator program suggest that Florida's investment in professional development has resulted in significant increases in teachers' use of instructional applications and in students' use of technology as a tool for learning. Specifically, teachers reported a significant increase in their use of advanced production software (such as video editing, web pages, concept mapping, and graphics programs). Student use also increased significantly in software that can be used as tools for learning (such as presentation software, concept mapping, video editing, and word processors).

Other indicators of the success of the program include significant increases in teachers' comfort and confidence using technology in the classroom, a reported increase in teachers' perceptions about their general school support, and a significant increase in student-centered learning activities (such as collaborative learning and individualized instruction). In fact, between the beginning of the four-day summer institute and the year-end survey, significant increases were noted in all sections of the *Perceptions of Computers & Technology* survey.

Some of the largest changes over time occurred in the sections related to the attributes of a digital educator. These attributes were based on national standards and expectations, such as the NETS for teachers, technology facilitators, and leaders (ISTE, 2007). For example, the mean for respondents on the item, "Infusing digital technology into a curriculum that is aligned with the

development of 21st century skills” increased from “comfortable” to “very comfortable.” A similar increase was seen for the items, “selecting appropriate digital content, tools, and other resources to support the curriculum” and “using digital technologies to collaborate with other educators.”

In addition to noting significant changes in their perceptions, the participants enjoyed the professional development activities that were provided for them – 98% percent reported a positive experience in the FDE program. In addition, 97% of the participants of the FDE program reported that they actively shared their knowledge and skills related to technology with their peers through workshops, mentoring activities, and resource; thus expanding the positive impacts of the FDE program to even more Florida teachers.

Sustaining the Momentum

The success of the Florida Digital Educator program is due to several factors, including the curriculum and intensive, hands-on strategy of the summer institutes, and the follow-up activities in the subsequent academic year. The curriculum emphasizes the use of digital tools to enhance learning. Through a series of short sessions, participants are introduced to various tools (such as podcasting or digital storytelling) in the context of K-12 lessons. The summer institutes model a student-centered, project-based approach, with ample opportunities for collaboration. Examples of technology-rich lesson plans in various content areas are woven throughout the summer institutes.

“While new digital technologies make a learning revolution possible, they certainly do not guarantee it. To take full advantage of new technologies, we need to fundamentally rethink our approaches to learning and education – and our ideas of how new technologies can support them” (Resnick, 2002, p. 32). A major focus of the Florida Digital Educator program has been the effective use of technology as a classroom learning tool. Continued support, resources, and professional development will enable Florida’s teachers to empower their students to succeed in the digital age.

Recommendations

As states across the nation seek to achieve technology literacy for all educators, the search for effective professional development programs will intensify. Although this research is limited to the participants of the first implementation of the Florida Digital Educator program (N=475), there are many elements and “lessons learned” that are applicable to a much wider audience. Based on the data presented in this report, the following recommendations are offered for future implementations of the Florida Digital Educator program and similar professional development initiatives.

Continue offering the intensive, hands-on summer institutes. Qualitative analysis of the responses from the participants who attended these institutes showed 88% had a positive experience, and 10% provided neutral feedback. In addition, quantitative analysis of the participants’ perceptions of comfort and confidence showed that, in just four days, participants felt significantly better prepared to implement multimedia projects and rubrics in the classroom.

It seems evident that the hands-on nature of the institutes, wherein teachers could actively practice the skills as they learned them was instrumental in the success of the institutes.

Continue to collect data for formative evaluation of the Florida Digital Educator professional development program. Effective professional development includes evaluation to assure that the training is meeting the specific needs of the participants (Rodrigues, & Knuth, 2000). Data from the first year's implementation provided essential information to document the program's success and to structure program modifications. As the FDE program continues into its second and third year, it is essential that data continue to be collected and analyzed to ensure continual program improvements and attainment of the program's goals.

Incorporate skill-based assessment of participants in FDE program. In addition to the surveys, interviews, questionnaire, and open-ended comments, it would be beneficial to obtain skill assessments of the participants at various points in the training. A pre-and post assessment of participants' skills would help to document actual changes in teachers' levels of expertise with various software programs. In addition, the projects and lesson plans that are created during the summer institutes (either individually or in groups) could be assessed using a multimedia rubric. This would model the use of rubrics as well as provide a more objective assessment of each participant's progress.

Allow more time per session so that the teachers can master the skill/technology before moving on to another topic. A recurring theme in the end of institute questionnaire was that the participants needed more time to practice and learn the new skills. In fact, 75% of the respondents specifically mentioned the need for more time. In the year-end survey, the most common recommendation for change was to "add more depth and less breadth" to the summer institute. Several attendees expressed frustration that the time per topic was too short for them to master the skills.

Provide subject-specific activities and lesson plans in the summer institutes. Many of the attendees expressed a desire for activities and lesson plans that were related to their content area. For example, one respondent suggested: "It would be helpful if specific subject areas were addressed. As a science teacher I would like to see what I could do that specifically relates to my subject matter."

Allow some participant choice (in topics) during the summer institutes. One respondent expressed a sentiment that was shared by several others, with the suggestion to "allow participants to choose from a menu of courses rather than attend all sessions; some things I didn't need more help on and others I would have liked more time in."

Consider alternate grouping strategies for the summer institutes. With attendees from such a wide variety of backgrounds, levels of expertise, content areas, and software platforms, it is almost impossible to structure a "one size fits all" program. Sixty-four percent of the respondents to the post-institute questionnaire offered suggestions of grouping strategies such as separating by expertise level, by type of platform used (Mac vs. Windows), and by technology interests.

Provide follow-up activities during the subsequent school year (after the summer institutes). “As teachers develop their core technology skills, they need on-going support through a professional development environment that is consistently interwoven with hands-on use of technology to reinforce their efforts and learning” (Cunningham, 2003, p.1). Although there were some follow-up activities in Year One of the FDE program, a consistent, continual sequence of activities and reflections would be beneficial.

Ensure follow-up mentoring. In order to become fluent with their new skills, teachers need to apply what they learned in the summer institutes when they return to their classrooms. Although many of the teachers had access to consistent mentors, others did not.

Ensure that the software programs that are incorporated in the summer institute will be available at the school and districts. Because of download restrictions, firewalls, availability, and other factors, some of the teachers could not load some of the programs on their school’s computers. As one teacher noted, “All the materials relied on loading programs onto the laptops or inserting CD’s. No one from my county has authorization to load the programs and none of our laptops have a CD drive. This created a lot of problems - we could not use programs, and we fell behind in the classes, etc. We also were not allowed to use several of the programs that we learned about during the summer training.”

Encourage districts to collaborate with the Master Digital Educator program. Approximately 45% of the MDEs reported that they conducted technology workshops for their school district. Increased district collaboration could benefit both the FDE program and the districts with both the teachers and students in their schools.

Increase communications prior to the summer institutes. Thirty percent of those who completed the post-institute questionnaire recommended pre-institutes communication and activities. There suggestions included: (a) having early communication about the requirements for participants by the institute and the district for their grant; (b) receiving hardware and software before attending the institute in order to assure that programs were installed and were ready for use in the workshops; (c) having a training session on how to operate the new hardware; and (d) taking surveys in advance and using this information for setting up groups before the session.

Offer advanced institutes during and in follow-up workshops. The responses to the FDE program were extremely positive. In fact, the program left many teachers eager for more training, more ideas, more collaboration – in other words, add another workshop or institute with advanced or follow-up skills related to technology integration.

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