The Effect of One-on-one Follow-up Sessions After Technology Staff Development Classes On Transfer of Knowledge to the Classroom

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Abstract: This study had two purposes. The first was to determine the effect of one-on-one follow-up session(s) on teachers' classroom integration of technology after attending InTech or a school-sponsored course on technology basics. Georgia InTech is a mandatory seven-day course teachers take to learn about *in*tegrating *tech*nology into the classroom. The second purpose was to identify characteristics of these sessions that would improve faculty development in technology application. The results of this qualitative study were compiled from the information collected from surveys, interviews with the participants about the activities, suggestions for improvement of the course, observations of the teachers performing their activities, and casual conversations with the participants who attended InTech or the technology course taught by the researcher. The results indicated teachers have a tendency to use technology more if they receive one-on-one mentoring after attending a large-group faculty development session. The researcher also gained information useful in making improvements to existing tutorials and faculty development sessions.

Introduction

Context of the Problem

Even with an abundance of technology available today, many teachers do not have the knowledge to use it effectively. The National Association for the Education of Young Children (NAEYC) emphasizes the need for increased professional development for teachers in technology ("Technology," 1996), and the need for teachers to develop professional judgment in specific use and evaluation of technology.

Professional development activities, such as workshops and conferences, have been criticized for being relatively ineffective because they are usually short term, lack adequate follow up and ongoing feedback, and do not connect to the curriculum (Forgione, 1999). Most teachers do not have the time to spend practicing what they may have recently learned in workshops or courses, so little transfer of learning takes place. Time not spent teaching is consumed in planning, preparing, additional duties, attending meetings, processing paperwork, communicating with parents, guardians and students, as well as working to address federal, state local, and professional association guidelines and mandates.

Transfer of learning takes place whenever our existing knowledge and skills affect what we do in the classroom ("Transfer of Learning," 1998). Research studies of memory following learning strongly indicate a sharp drop-off in recall capabilities succeeding initial input. This effect is even worse when factors such as passage of time interfere with immediate and regular application of the knowledge ("Transfer of Learning," 1998). Another research article stated that the transfer of new technologies and ideas is usually from teacher to teacher, in casual connections ("Teacher," 2001). This article also suggested it is very effective to focus on those teachers who are anxious to try new ideas in order to spread new technology and ideas.

As technology coordinator, I spend a considerable time consulting with other teachers on technology issues. While helping these teachers with problems, I have learned that usually only the most basic skills are used by many of our faculty members. InTech and the Staff Development Unit (SDU) courses I taught in the past were designed to help teachers incorporate technology into the classroom. Generally, however, it is those teachers who already have moderate or better computer experience who are more likely to transfer that knowledge to the classroom with little outside help.

During my InTech experience in the fall of 2000, a common comment on evaluation forms was the need for separate beginning and advanced classes. In fall of 2001, I had several casual conversations with four teachers from a neighboring school system during the time they were attending InTech. All stated that little of what was learned in InTech would be directly useful to them, because not enough time was spent on any one concept to effectively use it

at school, and they lacked follow-up support and time to try and implement what was learned. Another criticism I gathered from almost every former InTech participant with whom I spoke was that many projects completed in InTech class would not be directly useful in the classroom, because class assignments did not often consider teachers' individual classroom needs.

A survey of faculty at my school revealed many faculty members did not use technology in the classroom because they lacked sufficient skills, equipment, and time to do so. Even after seven days of InTech or a basic technology SDU course, teachers were left on their own to put to use what they learned with little or no mentoring. I learned in casual conversation that several teachers *had* used their newfound knowledge and skills, but only after receiving help from other faculty members, student teachers, or even students who were more advanced in technology skills. This research and personal experience prompted me to seriously look at what modifications need to be made in technology faculty development to encourage our teachers to use technology in their own classrooms.

Faculty who did not need to take InTech had the option of taking my "Technology Medley" course. The Medley class was taught two hours after school for five days over a two-week period. The objectives of the Technology Medley course were to instruct teachers on how to complete basic tasks in Windows, Microsoft Word, Excel, PowerPoint, Outlook Express, the Internet, and e-mail, as well as how specific features of each could be employed in the classroom. I developed a 24-page tutorial for the Medley class and later placed this tutorial on the file server, so it and the links to exercises could be accessed from anywhere and saved on individual hard drives for practice. I also used this tutorial in the one-on-one sessions that were part of this study.

I decided to focus on following up on the InTech and Medley courses, which research indicates is a critical component of classroom application. The old definition of training is, "short-term, standardized sessions designed to impart discrete skills and techniques, but in some places this approach has become the only channel for professional development, much beyond the domains in which it can be effective" (Grant, 1999). InTech and my own Medley course seemed to fit this description of training.

At Gato Middle School (GMS), all of our teachers have at least one computer in the classroom with Windows 9x, Microsoft Office, and Internet access. Even with limited equipment, a few of them can do a great deal with what they have, but the majority can only do basic word processing, e-mail, and Internet searching. What the faculty now needed was individual help with classroom integration.

While conducting my literature review, I discovered there were many factors leading to the failure of professional development in technology. Many of the articles stated a need for follow-up, mentors, in-house technicians, peer tutoring, and some form of evaluation of what the teachers were doing with their technology knowledge. GMS has suffered these problems and we needed to find solutions to help teachers use technology and technology skills more efficiently in the classroom. Research supports the fact that having one-on-one help after technology skills classes encourages teachers to use the technology skills they learned, as opposed to just attending the classes, and that one-on-one instruction is generally more effective than a classroom situation.

Gato Middle School is one of two middle schools in the Gato City School system and houses sixth, seventh, and eighth graders. Gato City, with a population of approximately 53,000, is located in the South Central Georgia. Slightly over 50 percent of the student body is on free or reduced lunch. There are over 850 students, 56 faculty members, two media specialists, two guidance counselors, five secretaries, three assistant principals, and one principal on staff. Approximately five percent of the faculty could be considered accomplished computer users, as indicated by personal contact and a faculty survey. The principal is pro-technology, quite knowledgeable, and has done a great deal to secure the equipment presently in place. He is also very concerned about teachers using the available technology as much as possible. I serve as technology coordinator, technology staff development trainer, on-site technician, and computer lab teacher with three 70-minute classes daily. My job as technology coordinator involves handling minor technical problems, answering technology related questions, as well as designing and teaching technology SDU courses.

Statement of the Problem

Many teachers are not using the technology skills they have learned after attending SDU technology classes (such as Medley) or InTech. The purpose of this study was to determine what modifications need to be made in technology faculty development to encourage our teachers to use technology in their own classrooms. Specific questions I attempted to address were:

- What are the effects of one-on-one follow-up session(s) on teachers' transfer of knowledge to the classroom after attending InTech or the Technology Medley SDU course?
- What characteristics and factors contribute to successful one-on-one faculty development in technology?

- What characteristics and factors detract from successful one-on-one faculty development in technology?
- How should future technology SDU courses be modified to reflect what was learned during this intervention?

Methods

Participants

The teachers participating in the study were selected because they had attended either InTech or the Technology Medley class. Each teacher completed a participant consent form with assured anonymity and was asked to select a "nickname" for use in this article.

- Group A - five GMS teachers who attended InTech fall 2001 and one who attended in fall of 2000, all of whom received one-on-one follow-up sessions. Two of these teachers have at least 15 years of teaching experience and had previously taken other technology courses or workshops. The others have five to ten years experience.
- Group B - six GMS teachers who took the in-house SDU technology course, all of whom received one-on-one follow-up sessions. Four of these teachers have at least 20 years experience and had previously taken other technology courses or workshops. The other two have five years experience.

- Group C - three female teachers from the neighboring Marinero county system who attended InTech during the same time frame as Group A, but did not receive one-on-one follow-up sessions. All of these teachers have at least 15 years experience in the classroom.

Intervention

Overview

Teachers in Groups A and B received one-on-one sessions within two months after their SDU technology course or InTech. The last three weeks in February 2002, I met with each teacher for one or more one-on-one sessions in his or her room, either during my planning time or after school. The purpose of the one-on-one sessions was to review and reinforce skills learned during either InTech or the Medley course, and to encourage classroom integration. The one-on-one sessions ranged from 30 minutes to five hours, depending on the complexity of the activity proposed, three of which took place over a period of several days. In preparing for the sessions, I looked over each teacher's proposed technology activities on their surveys, then discussed the ideas with each one a day or so before the session. We worked with the programs available to them on their computers, taking as long as necessary for them to become comfortable with the requested skill. I suggested how the applications could be used in the classroom to improve some aspect of instruction. Together we created an activity on which they practiced the skill until they felt comfortable, after which they completed an activity on their own. When other requested information had not been covered, or was covered insufficiently in the tutoring session, I was able to supply it to them soon afterwards. Teachers also had access to the tutorial I had developed for the Medley course.

Gathering the Data

I collected data via surveys, confirmatory interviews, observations, and casual conversation. I also kept a log with additional commentary and reflection on the interviews, observations, one-on-one sessions, and other events related to the implementation. Instruments developed for prior, planned faculty development also helped to inform this study. For example, I already had information on the compilation of basic computer skills possessed by fifteen of our teachers who were slated to attend InTech.

All the surveys and questionnaires had high response rates. The large group survey (entire faculty) response was seventy percent (70%), and revealed information on teaching experience, certificate expiration dates, perceived computer competence, and reasons for not using technology. The small group response rates were 100%. All three groups participating in this action research reported on technology courses they had previously taken, their

satisfaction with those courses, and what technology they were presently using. Groups A and B were also asked to describe the specific activity or activities they would like to receive help with and when it would be convenient to meet. They were also interviewed just before our scheduled meeting to determine exactly which skills they wished to work on.

I also developed a classroom observation form to guide my note-taking while watching Group A and B teachers demonstrating their activity. If direct observations were not possible, the teachers were asked to fill out the form themselves. Analysis of this information helped me to determine how well the activity worked, what improvements needed to be made in the way the activity was handled, and what changes needed to be made in the one-on-one sessions as well as future faculty development efforts.

Results and Analysis

I'll report first on participants' responses to InTech and SDU technology courses, which included the fifteen teachers in all three groups. Table One offers a summary of this data. Teachers were asked to rate their level of expertise as technology users as a result of the InTech or Medley. Five of them contended their level of expertise remained the same after the courses, with the rest advancing "one level" (i.e. from novice to intermediate), but no one considered himself or herself "expert." The most valuable aspect of the courses for five of the teachers was the exposure to a variety of software and/or equipment they considered potentially useful in the classroom. Eight teachers noted interest in more specific software/hardware uses. As far as the least valuable aspects of the classes, almost all of the InTech group mentioned, in casual conversation, the need to prepare for substitutes and doing too many course assignments outside the classroom. It was also specified by three teachers [on the survey] that much of the InTech material would not be directly useful in their classrooms. Too much content in too little time was a major problem for three of them. Two, however, considered all they learned to be useful. One stated that the outside work was excessive. In recommending changes in the courses, four suggested that more time was needed to cover the material, two mentioned leveling of the courses was important, three thought the work needed to pertain to what they were doing in the classroom, one indicated more one-on-one help, two said there should be less outside work, and two had no suggestions.

Thirteen of the fifteen teachers reported they were making limited use of what they learned in the courses, which included PowerPoint, Excel, Word, Internet, e-mail, and the digital camera. Those who were not using the technology explained that it was because of insufficient equipment and/or software. However, all of the teachers said they would be more likely to use more technology if they had one-on-one help. One stated she really did not need the one-on-one, but just more time to experiment. The majority wished to learn more about specific software applications and several teachers wanted to know about more than one. (See Table Two).

TABLE 1 – Reaction to InTech or Technology Medley Course

QUESTION	GENERALIZED RESPONSE	NUMBER
How did you rate yourself as a computer user BEFORE any technology training?	Novice	11
	Novice +	1
	Intermediate	3
	Expert	0
How do you rate yourself AFTER InTech or the Technology Medley course?	Novice	1
	Novice +	4
	Intermediate	10
	Expert	0
What was most valuable about the technology training you had?	Learning a variety of software/hardware applications	6
	Learning specific applications (each person specified from one to three)	8
	Everything	2
What was the least valuable about the technology training you had?	Time factor	3
	Specifically mentioned applications	3

	Stress in preparing for substitutes/lesson plans	all but 2
	Too much outside work	1
	Nothing	2
What changes would you recommend in the technology training you had?	Time factor	4
	Have beginners/advanced levels	2
	Specific suggestions about course content	2
	Produce products useful in own classroom	3
	Not so much outside work (i.e. lesson plans)	2
	Have more one-on-one	1
	Nothing	2
Have you used some of what you learned in any of the courses or workshops in your own classroom?	Yes	13
	No	1

TABLE 2 – Specific Technologies Teachers Identified

PowerPoint	Excel	word processing	Internet	e-mail	web page	class management	using specified equipment
7	2	2	1	4	1	1	1

When surveyed about why they were not using more technology in classes, most indicated insufficient time and equipment. The results of this part of the survey are shown in Table 3.

TABLE 3 – Barriers to Technology Integration

Teacher	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	total 25
Don't have time	X	X	X		X	X		X	X	X	X	X		X	X	X		X	X		X		X			17
Don't know enough		X	X		X		X		X	X	X	X	X	X	X								X	X	X	14
Don't have enough equipment		X	X	X	X			X	X		X	X	X	X	X	X	X	X		X	X	X	X		X	19
Don't want to		X	X		X		X			X				X									X			7

Survey results and encounters with participants indicated they benefited from the one-on-one sessions. Interviews and discussions indicated these sessions enabled them to create an activity that was useful to them, saved them some time in the long run, and/or motivated their students. The classroom observation forms encouraged the teacher to analyze the classroom implementation, judge the effectiveness of the activity, consider student reaction, and confirm the value of the one-on-one help. These forms also helped me to evaluate the effectiveness of my work with the individual teachers and make or consider changes to future faculty development sessions.

This study did not find any differences between Groups A and B as far as the impact of the one-on-one sessions. However, those who considered themselves at the intermediate level of knowledge required much less time during the one-on-one sessions to grasp the application on which we were working. All of Group C reported that they were not quite able to apply lessons learned at InTech, but would have incorporated more of the technology if they had follow-up help at their schools. I believe one difference in transfer of learning was due to previous technology experience and age. Those who were younger and/or more experienced required less one-on-one time.

All of the teachers improved upon, or started using one or more skills they had learned in the courses. Snapper began creating a web page for the media center. Using Excel, Geechee created an interactive exercise, Elizabeth constructed a discipline record, and Brownie had her students create pie graphs. SuperCat, Chris, Lady C, Shakebe, and Snuffy were able to create address groups, send attachments, and create templates in Outlook Express.

Wild Bill, Omicow, Shakebe, Snuffy, and SuperCat created PowerPoint presentations to use in class. Geechee created links to interactive math sites on the desktop and Shakebe created puzzles using an Internet site.

The reactions of the participants, students, and other teachers were all favorable. Students' attention improved with the use of Excel and PowerPoint lessons. Teachers' and students' access to information was facilitated through the media center web page, shortcuts for links to web sites for math, and locations for printable activities. Teachers' paperwork was reduced, and time was saved by creating address groups for e-mail and spreadsheet templates for various activities.

Having to teach aspects of certain programs during the one-on-one sessions forced me to learn more about them. On at least eight occasions during the one-on-one sessions, the information I had located was of use to another participant, and even to other faculty members who were not part of the study.

What characteristics and factors contribute to successful one-on-one faculty development in technology? Even in the best of SDU courses, all teachers do not learn at the same rate and no one is going to learn everything that is taught. Many courses are designed to cram the maximum amount of content into the least amount of time, and thus proceed at the same rate for all those attending. Individualization and meeting specific needs is perhaps the greatest strength of the one-on-one sessions.

Other benefits were time flexibility and creation of a useful product. I was able to give more attention to just one or two people and the application of their choice. They were free to ask questions or bring up problems without fear of embarrassment or holding up others, work at their own pace, and practice until they felt comfortable with the skill. If they were not sure exactly how to accomplish an activity, I was able to offer suggestions or give examples from my experience or that of others, and together we adapted it to fit their need. Sometimes during the one-on-one sessions, other teachers would come by to see what we were doing and ask questions that would, in turn, prompt additional questions from the participant. Occasionally, I was unable to answer questions right away. With one exception, I was able to offer an answer within 24 hours. For example, Elizabeth asked how she could send the practice exercises from the tutorial to her home computer. I derived two ways to accomplish this and consequently added them to the tutorial. In looking for interactive math sites, I located several other sites that would be beneficial to the media center web page. This flow of ideas worked in both directions. Snapper's idea about placing an icon on the desktop for the card catalog provided me with the idea to create shortcuts to the interactive math pages for Geechee.

Mentoring does not always come from the "technology person." Other teachers, State University student teachers and interns, and even our own students were a great source of technology information and inspiration. They are not afraid to try something new and, in doing so, inspire their supervising teachers to try it also. Omicow showed me his web page that his student teacher created with Publisher. Unaware of its web page capabilities, I had never investigated it for uses beyond desktop publishing. One of my own students was playing around with Word and located the control tools for web page construction. Both instances have inspired me to practice more with those two programs. Coco, another teacher who is working on a second degree, is conducting similar research. We were able to share information about our PowerPoint tutorials, providing suggestions for improvement to each other. The finished products will, in turn, benefit the rest of the faculty as we continue to integrate and share what we've learned, forming conversations around common technology topics.

What characteristics and factors detract from successful one-on-one faculty development in technology? When I began this study, I foresaw few problems, but I soon realized how shortsighted that was. Scheduling was a major problem. I had to reschedule with eight teachers due to illness, unexpected duties, and technical problems that required my immediate attention. Due to conflicting daily schedules, I was unable to directly observe the majority of the activities the teachers completed.

Being a colleague or close friend with my mentees meant constructive criticism was more difficult for all involved, both in their suggestions to me and mine to them. However, knowing the personality of each mentee and their knowledge level facilitated delivery of my instruction.

A few of the activities we attempted took longer than expected. Program differences posed problems on three occasions. Failure of Snapper's web page to function properly when posted to the server was finally tracked down to the fact that we had been unknowingly working with three different versions of Netscape. I was unable to share much of the e-mail tip-sheet I had compiled with Snuffy and SuperCat because their Outlook Express was older than the version I used to create the advice. Problems transferring information between Word and PowerPoint or Netscape Composer often resulted in more time being spent in those sessions. Untested tutorials, such as the one I designed for web page construction, contained several flaws that were discovered when Snapper attempted to use the print version for direction. Though promptly corrected, testing would have reduced or eliminated such difficulties.

In reviewing answers to survey questions, I realized the need either to reword them or to ask another question that would clarify the previous answers. For example, "What was least valuable about the technology training?" should have been followed by "Why?"

Before beginning my one-on-one sessions, I should have verified what versions of the programs involved were in use by each participant. This would have prevented several of the time-consuming problems experienced during the sessions.

A few teachers just do not want to try to incorporate technology into the classroom. Others are not using technology, not because they do not know how, but because they lack sufficient equipment. Most of our equipment is outdated, but hopefully with the completion of a new school in the fall of 2002, that situation will improve.

Final Thoughts

With the exception of this study, there is still no formal assessment or planned follow-up sessions for InTech or SDU courses taught on site. Though this study will inform decision makers and faculty, efforts to assess the effectiveness of faculty development should continue. The methods and instruments employed in this study could provide the foundation for such assessment.

Many times, the phrase, "I hate to bother you, but…" precedes a plea for technology advice. Teachers probably would ask for help more often if they had a resource person who had few other obligations. We have a computer technician for every two or three schools, but there is a severe need for a full-time technology person who can not only troubleshoot, but also act as advisor to teachers and staff.

The outstanding problem encountered in this study seemed to be time. "The biggest barrier to technology integration is time: time for training, time for teachers to try out technology… time to talk to other teachers about it" (O'Neil, 1995). The bottom line, however, is that what we are trying to accomplish through faculty development in technology is ultimately for the benefit of the students. If the teacher is not properly skilled, there is little chance for student performance to improve.

This study confirmed the benefits of one-on-one mentoring and faculty development activities centered on what teachers can produce and use in their own classrooms. The participants acquired a few more skills they will continue to develop and share. I have learned a great deal about the challenges of technology integration, and this knowledge will greatly benefit me and improve my skills in helping others in the future. However, it will take more than one person working in her spare time to continue and to expand this work. Increasing individual follow-up to technology courses will certainly contribute to the results expected from teachers and students using technology.

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