SPECIAL FEATURE

Creating Sustainable Technology Integration with Teachers

One One-Hour Workshop at a Time

Barbara A. Chamberlin and Tammy Pandina Scot

Abstract

Technology learning for K–12 teachers often occurs through short afternoon workshops or a single day-long session. Such circumstances emphasize the need for properly planned, high-quality technology workshops that ensure the sustainable integration of technology within content matter. The authors provide pragmatic and useful guidelines for technology integration into short-term training opportunities, including: creating the workshop description for participants, analyzing needs, developing the course structure, building in mechanisms for evaluation, and ensuring sustainability of the instruction. A short rubric outlines the recommendations (p. 25) and can be used as a guide for workshop planning and self-evaluation.

In the real world, technology integration happens slowly, usually one afternoon at a time. We've come to understand this through our roles as technology integration specialists. We've been involved in two-year projects with a small core of teachers, short-term "what can you do with a week" projects, and individual software training sessions. Though we feel strongly that realistic technology implementation has to occur over long periods of time with continual support, we're realistic enough to know that most teacher training happens during summer workshops, inservice days, and the rare day of personal leave. Sometimes the afternoon workshop is for 20 high school social studies teachers, and the workshop is designed to help them use primary sources with Web pages they create. Other times, we are asked to give a one-hour program to all middle school teachers on integrating PowerPoint into the classroom.

These circumstances have created the need for quality technology workshops. What are the factors that foster this quality? We've tried to answer that question in a pragmatic and useful way, drawing on hundreds of hours of combined experience that we have with technology workshops. We describe the attributes of a successful workshop and conclude with a rubric, which can be used for planning and self-evaluation. You may find it helpful to keep a copy of the rubric in your desk drawer, using it as a guide each time you plan a workshop.

In designing a workshop, we look at creating the workshop description for participants, analyzing the needs of participants, developing the course structure, building in mechanisms for evaluation, and ensuring sustainability of the instruction. Though some of these activities take place after the workshop—such as evaluation and sustainability actions—each aspect must be given consideration in the planning stages.

Whether the workshop goal is to teach the technology tool as a reference point or to teach the content through the use of technology, good workshops should encompass what is known about adult education, technology training, and content-based instruction. Workshops of 45 minutes or three hours or even multiple-session courses can yield sustainable change—provided the appropriate needs analysis, content-based instructional strategies, and long-term planning have been used.

Workshop Description

Give a clear description of objectives, scope of workshop, and prerequisite skills.

The more specific the description of the workshop, the more likely that the participants will self-select workshops that meet their needs. It is unfair to ask participants to commit the time to attend a workshop, only to find that the content covered was already known or above their capabilities.

Prerequisite skills should be stated explicitly so attendees can make thoughtful decisions on which workshops to attend. "For beginners" or "for advanced users" is not enough—state the expected level of the workshop attendees with clear descriptors. When workshops include learners with a range of experiences, give participants an idea of what will be covered, and what they can expect to accomplish within a range of skill levels. For example, for a workshop on WebQuests, the description could include:

The focus of any workshop should be student learning—emphasizing how technology can improve content learning through examples, documentation, and instruction.

- Beginners with no Web development experience will evaluate WebQuests and spend workshop time identifying quality WebQuests for use in their classroom. They will create a simple Web page that describes and links to these WebQuests.
- Intermediate users who have some experience with creating Web pages will begin their own WebQuest. However, they may not finish their WebQuest in class.
- Advanced users with Web development experience can expect to leave the workshop with the majority of their WebQuest completed.

When providing advance information about the workshop, include resources for obtaining prerequisite skills so participants can be prepared for the instruction being offered. As a cautionary note, when listing prerequisite skills, be sure to use friendly, not "techy" terminology. Teachers can easily sell themselves short on their own skills and shy away from workshops that sound too technical but which may be very appropriate for them to take.

For example, "Participants will be creating online portfolios using Netscape Composer. Some experience with Netscape Composer is required. For those who were unable to attend last month's 'Beginning Web Pages' training session, review this Netscape Composer tutorial online [give address]. Participants should know how to create a new page; create bold text, italic text, and lists; insert pictures; and make links to Web pages."

Needs Analysis

Understand Teachers' Background and Needs

By knowing your audience, you can create a workshop applicable that is to each teacher's instructional needs. You may need to know:

- Do they use computers every day?
- Do they have one computer in the classroom or a lab setting?
- Are they looking to use the software for management (writing letters to parents, creating presentations for parent/teacher night) or instruction (creating an integrated unit on Egypt)?
- Do they feel comfortable exploring on the computer, or does using a computer feel intimidating?

"Teachers are more likely to embrace technologies if they can see the connection between their work (covering and exploring the curriculum) and the tools" (McKenzie, 1999). Help teachers make this connection by knowing:

- What content and grade do the participants teach?
- Are there any particular teaching challenges related to content or standardized testing?

Craft examples, templates, and tutorials in which teachers can see themselves using the technology.

Computer and Software Access

Teachers and administrators may not know what questions to ask about a technology workshop, so you can help them prepare. For example, workshop participants need access to software after the workshop is finished. Will instruction be done on the same platform (Mac versus PC) as individual development? If not, investigate ways to get them software for their home/class computers or use software to which they will have access. Do you need to get each teacher a copy of the software and hand it out at the workshop? If it is impossible for every teacher to access that software after the workshop, you may need to consider teaching with other software. Do teachers know how to access the software or reserve lab time for instruction? Remember to include these details as part of your overall strategy.

Analyze Participant Motivation and Expectations

Are teachers attending simply because they have had a mandate to use a computer? Do they need to sign off on a particular competency? Are certification points/hours necessary? Meet teachers' needs first. Make use of "extras" like snacks, promotion certificates, and giveaways to create a sense of accomplishment and well-being for the participants.

Encourage participants to bring copies of their curriculum plans. This helps reinforce the teaching of content over technology and encourages them to analyze their own needs.

Course Structure

Emphasize Content over Technology

"Too much time has been wasted on teaching computer applications apart from their classroom utilization" (McKenzie, 1999). The focus of any workshop should be student learning—emphasizing how technology can improve content learning through examples, documentation, and instruction. When participants teach different subjects or age levels, capitalize on this diversity. When giving a workshop on WebQuests, provide a handout with possible uses in English, science, math, social studies, business studies, foreign language, health, and physical education.

Slightly changing the focus of your workshop can facilitate the emphasis of curricular content. Instead of offering an Intermediate PowerPoint workshop, consider one on Developing Student Portfolios Using PowerPoint. Instead of teaching HyperStudio and encouraging participants to brainstorm uses of the program, teach

Workshop Planning Self-Assessment Rubric

Use as a guide when preparing and reflecting on the success of a workshop.

	Acceptable	Preferred	Ideal
Workshop description	Objectives and prerequisites are provided: • on the day of the workshop.	Objectives and prerequisites are provided: • *before* the workshop.	Objectives and prerequisites are provided: • before the workshop, and • *resources are provided for prerequisite skills.*
Needs analysis	Participants: • introduce themselves at the beginning of the workshop and • share their background information and expectations.	Participants: • *complete a written questionnaire* at the beginning of the workshop that covers: ◦ information about their content area, ◦ grade level, ◦ specific experience with the topic, ◦ software and computer access, ◦ workshop expectations, and ◦ motivations.	*Before the workshop,* participants: • are individually contacted with a questionnaire that covers: ◦ content area, ◦ grade level, ◦ specific experience with the topic, ◦ software and computer access, ◦ workshop expectations, and ◦ motivations.
Course structure	• Examples and instruction are focused on students learning content.	• Examples and instruction are focused on students learning content.	• Instruction and examples focus almost exclusively on student learning within the context of the participants' backgrounds and experiences.
	• Technology is *modeled.* • Discussion on classroom integration is encouraged during the demonstration and at the end of the workshop.	• Technology is *modeled twice,* with participants following along. • Throughout the workshop, teachers are encouraged to *generate their own connections* through discussion.	• Technology is modeled twice, with participants following along. • *Others have the opportunity to move forward on their own* with a tutorial or inquiry-based project. • Teachers are continually encouraged to generate their own connections to the content.
	• Participants are encouraged *to complete the demonstrated activity* with hands-on learning time.	• Participants are allowed *to choose from a variety of tutorials or activities* during hands-on learning time.	• Participants are allowed to choose from a variety of tutorials, activities, or *inquiry-based* projects.
	• Approximately *25%* of workshop time is allotted for teachers to invent uses for their own classrooms.	• Approximately *40%* of workshop time is allotted for teachers to invent uses for their own classrooms.	• Approximately *50%* of workshop time is allotted for teachers to invent uses for their own classrooms.
	• Uses *premade tutorials* with source documentation.	• Uses *content-specific tutorials* that model relevant technology integration.	• Uses content-specific tutorials that model relevant technology integration. • *Includes tutorials not covered in the workshop for further use.*
Evaluation	• Uses informal pacing and progress checks throughout the workshop. • Uses a *ready-made feedback form* currently in use by your client.	• Uses informal pacing and progress checks throughout the workshop. • Uses a *written feedback* form at the end of the workshop with open-ended questions.	• Uses informal pacing and progress checks throughout the workshop • Uses a written feedback form at the end of the workshop with open-ended questions. Solicits feedback several weeks after the workshop to evaluate the sustainability of the teachings.
Ensuring sustainability	• Provides written contact information to participants, including support numbers and peer contact information.	• Provides written contact information to participants, including support numbers and peer contact information. • Provides follow-up information to administration?	• Provides written contact information to participants, including support numbers and peer contact information. • Provides follow-up information to administration. Makes follow-up contact with the participants.

ISTE Copy-Me Page

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Examples and demonstrated activities should be replicated in written tutorials, because once participants leave a workshop, they are likely to forget some of the step-by-step instructions they were given.

a workshop on Community History Projects and encourage participants to explore variations on the theme.

When teaching participants in the same subject area but differing grades, scaffold resources to include uses for different grade levels or versions of the subject. For example, if teaching about PowerPoint to elementary teachers of writing, the younger grades could make a one-slide presentation learning to add a headline to a picture, while third graders could make a riddle slide show listing three sentence clues and a picture for the answer on the second slide. Both examples address the skills of PowerPoint and are grounded in classroom content. In giving a workshop on using a digital microscope, make tutorials available with explorations in earth science, physical science, biology, and chemistry.

Design Workshop to Include a Conceptual Image, Modeling, Discussion, and Invention

Help participants understand what the software does by creating a conceptual image for the participants. Use non-technical words to build a bridge between the everyday world and the "techy" world. For example, databases organize data. In teaching this concept, bring in a recipe box with *records* on cards. Demonstrate sorting the recipes or *records* in the box by ordering them alphabetically and then demonstrate running a *filter* by taking out all the *records* that are main courses. By explaining that one could look at the recipes on the file cards or put them on larger pieces of paper with a picture, you are demonstrating that it is still the same recipe—just viewed in a different *layout*. All these examples demonstrate the basic concepts of a database. Next, help the participants to synthesize their understanding by asking participants to think about other databases they have around them, such as card catalogs and electronic gradebooks.

Allow participants to watch an activity being modeled and then give the students the opportunity to do the same activity or choose from similar structured activities on their own. Some learners may prefer to have it demonstrated once while they watch and then a second time while they follow along. Some learners would rather move at their own pace using step-by-step written instructions for the activity that was demonstrated. Others learn technology best by delving into a project, using their best problem-solving skills to move forward, and asking for help when they are stuck. All three learning preferences may be accommodated with one activity. By honoring differing learning styles, you are modeling how the participants can teach technology to their students. Technology may become the most powerful tool in the classroom for building an environment that honors individual learning needs.

Learners move through different stages as they acquire technology competence: entry, adoption, adaptation, appropriation, and invention (CEO Forum, 1999). Informing the participants of these stages helps them validate their own experiences. When they understand that technology learning is a process, they can often relax into the experience and increase their learning.

Time will dictate how much hands-on time participants will have, but remember that technology is learned by doing, not watching. Time for guided practice is essential. Ideally, 40%–50% of the workshop would be spent on guided practice and invention. You should provide follow-up activities that build on what is taught and apply directly to the teachers' classrooms.

For example, once the learners follow the step-by-step demonstration on creating a database using students' contact information, science teachers can work together in groups to develop a database for cataloging animals and their classification systems, allowing students to sort and run filters to better understand biological classification, while language arts teachers can create a database for writing structured poems like haiku or cinquain. Giving teachers choice in their assignments allows the workshop time to be spent in a productive and useful way. If teachers make something that they can use in their own classrooms, the likelihood that workshop content will be used increases.

Another way to develop buy-in is by scheduling time for a discussion of technology integration possibilities, allowing participants to develop ownership of the technology. Through discussion, participants develop an understanding of how the application can be integrated into curriculum and decide when the use of this tool is most appropriate. At this point, encourage participants to review their curricular needs, evaluating ways in which the new technology can facilitate teaching and learning within their content area.

Following the dialogue, participants should have time for invention (structured time to develop what has been taught to meet their own needs) and consultation (some one-on-one time with experts to ask questions). Invention time is a structured, project-based component of the workshop where the presenter holds clear expectations for the work that needs to be accomplished, while allowing for freedom and flexibility in the types of products that are created.

In the database example, participants work in groups organized by content areas where they discuss how databases can assist students in inquiry-based learning. Ask participants, "What can stu-

dents learn by grouping and sorting data?" In this way, the teachers develop a project to work on that can be immediately useful.

When there is simply not enough time to do everything that needs to be done, a community of sharing is a useful tool. Having participants work in teams is the most productive, particularly if they know each other or have common curriculum and goals. Showing examples and setting up a place to share all of the products creates a sense of purpose. Learners may also feel a sense of purpose and worth, knowing they are expected to contribute to the group.

Provide Well-Organized Instructions, Tutorials, and Resource Guides

Course materials need to be prepared carefully, reflecting the teachers' needs. Examples and demonstrated activities should be replicated in written tutorials, because once participants leave a workshop, they are likely to forget some of the step-by-step instructions they were given. In any tutorial, the user should be given step-by-step instructions and a vision of the final project, either a picture or a link to an example of a finished product. If time is limited, use premade tutorials. If these are not content relevant, you can prepare additional materials that make that connection for the teachers. Any files used in the workshop should be available to participants. These can be either left on their network, e-mailed to participants, or provided in disk form. Be sure to include a footer on all handouts that lists the date and title and identifies where they came from or who made them. This is also a good place to give your contact information.

It is also necessary to empower the participants to find further resources. Do they have access to the manual that came with the software? Do they know how to use online help? This can be modeled by demonstrating how to insert a movie into PowerPoint, then how to find step-by-step instructions for doing the same task using online help. Another way to encourage learning beyond the scope of the workshop would be to leave several advanced tutorials for participants to work through independently, extending the learning past a single workshop experience.

Evaluation

Use Progress Checks for Ongoing Evaluation during the Workshop

Periodically, check the progress of the course by asking participants, "How's the pacing? Am I going too quickly, too slowly? Are you learning what you hoped to learn?" A simple thumbs-up for increasing the speed, thumbs-down for slowing the pace, or a horizontal thumb for just right provides a quick and easy visual to the trainer on how to proceed. Feedback can also be solicited at a break time through casual questioning of participants. Breaks also allow the participants to step back from the workshop, evaluate their own progress, and network with each other. Use the last 10 minutes of the session to reflect and wrap up what was learned.

Plan Evaluations to Improve Future Workshops and Identify Continuing Needs

If you are giving a multiday workshop, take advantage of daily evaluations to prepare subsequent workshops. Take advantage of written evaluations to review your own strategies. For example, the attendees could rank the relevancy of tutorial and project samples for use in their classrooms. Questions that assess the competency levels of participants would also be useful.

In addition, workshop facilitators should contact the participants weeks after the workshop, asking for additional follow-up and thoughts on the training. Success can be measured through participants actually incorporating the skills learned into their lessons. Feedback on this area would be useful, as well as assessing the attendees' comfort level with the software weeks after the training. "Did it stick?" You may find that some of the follow-up issues could easily be solved by directing them to a Web site, or that the time to reflect has given them additional perspectives on what is needed in future workshops.

Ensuring Sustainability

Reinforce Existing Support Structures

Convey existing support structures, such as district technical support, to the participants, providing the needed phone numbers, e-mails, and introductions. Often teachers do not know what kinds of support are available within their own system. You can also provide resources for further exploration, including books, Web sites, or people who may be contacted. It is imperative to establish a community of support among participants. Use break times and meals to facilitate group connections and encourage the buddy system for peer coaching. Ideally, every workshop should have a follow-up component, such as instruction with classroom visitations, e-mail contact, or additional workshops.

Identify Participants' Continuing Needs

Do not underestimate your realm of influence. To encourage sustainable change, it is necessary to identify what is needed

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for the workshop instruction to take hold in the classroom. Share these needs—such as resources, time, or additional training—with administrators. Workshop facilitators can validate the needs of participants to administration through the context of sustainability. These needs may include support, release time, and software or hardware purchases. After the workshop, consider a follow-up letter to administrators reviewing the workshop, identifying areas for future instruction and outlining needed resources that would encourage sustainability of what was taught.

Creating sustainable workshops is hard work. It involves careful planning, a well-organized yet flexible course structure and deliberate follow-through. The rubric on p. 25 is based on these suggestions. It is designed for use during the preparation of the workshop as a self-assessment tool. Though no workshop is ever ideal in all areas, continually assessing ourselves against this standard may help create sustainable change—one workshop at a time.

References

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