

Title: Teachers of the 21st century know the what, why, and how of technology integration.

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Author(s): Dockstader, Jolene

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TEACHERS OF THE 21ST CENTURY KNOW THE WHAT, WHY, AND HOW OF TECHNOLOGY INTEGRATION

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So your goal is to be a teacher for the 21st century. The easy way is to stay in the profession for two more years! However, if your goal is to be a teacher that prepares students for the 21st century, then your objective has to be more challenging. The teacher of the future must be not only accomplished in instructional techniques and technology, but also in the integration of technology into the curriculum. The questions arise of what is technology integration, why should we integrate, and how do we integrate. The Jerome Joint School District #261 has spent the last 18 months trying to answer these questions. Although integration models and instructional practices are still developing and being assessed, following are some of the insights into technology integration and some examples teachers in our K-12 district have found to be effective.

[What is Technology Integration?](#)

Let's first define what it is not. Integration is not putting computers in the classroom without teacher training. It will not happen without training. Integration is not substituting 30 minutes of reading for 30 minutes of computer skill development. It is, however, using computers to teach 30 minutes of reading. Integration is not providing application software like electronic encyclopedias, spreadsheets, databases, etc. without a purpose. It is not prepackaged programs that are often unrelated activities clustered around a particular topic that address few higher concepts or goals. Nor is it teacher created programs that cover special interests and/or technical expertise but do not fit content-area curriculum. Defining what technology integration is and is not is the first step in deciding how to integrate it into the classroom.

Now let's define what it is. Technology integration is using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways. Discrete computer skills take on new meaning when they are integrated within the curriculum. Integration is incorporating technology in a manner that enhances student learning. Technology integration is using software supported by the business world for real-world applications so students learn to use computers flexibly, purposefully and creatively. Technology integration is having the curriculum drive technology usage, not having technology drive the curriculum. Finally, technology integration is organizing the goals of curriculum and technology into a coordinated, harmonious whole.

Why Integrate Technology?

The next question is why integrate technology at all? This is a question the teachers in the Jerome School District struggled with, especially in the beginning. However, we knew opinions among both the public and other educators are leaning toward the fact that students need to be proficient computer users. Here are a few but important reasons for integrating technology that we have come to understand in our efforts to integrate technology: 1) correctly designed, more depth into the content-area curriculum is possible, 2) in the information age, there is an intrinsic need to learn technology, 3) students are motivated by technology, thus increasing academic engagement time, 4) while working in more depth with the content, students are able to move beyond knowledge and comprehension to application and analysis of information, 5) students learn where to find information in an information rich world, 6) computer skills should not be taught in isolation and 7) students develop computer literacy by applying various computer skills as part of the learning process.

How Do You Do It?

Once we know what and why, we have the question of how. Michael Eisenberg suggests that there are two requirements for effective integration of technology skills: 1) the skills must directly relate to the content area and to the classroom assignments, and 2) the skills themselves need to be tied together in a logical and systematic model of instruction.^[1]

Following are seven steps teachers in the Jerome School District found to be effective in tying the skills to a content area:

1. Choose a core area (just one to begin with), e.g., reading, writing, math, science or social studies.
2. Decide what technology skill(s) you want to teach or could be best taught in this area.
3. Choose one lesson or unit that could be enhanced or taught through the computer. Stick with an easy project in an area you are comfortable with.
4. Develop that one lesson or unit in a software package or medium you know very well.
5. Use it!
6. Evaluate how it went (what went right or what went wrong). This important step should not be left out!
7. Refine the lesson and/or start with the next lesson or unit.

Here are two examples of this process:

Project 1: I wanted to integrate technology into my sixth grade science curriculum on the periodic table. Internet addressing, e-mail retrieval and sending were the technology skills I

used for the project. After finding a site, I emailed my students this message:

Hi Guys and Gals?
Here is your Internet assignment on
elements in the periodic table:
Print out this e-mail.
Go to [http://the-tech, mit.
edu/Chemicool/](http://the-tech.mit.edu/Chemicool/)
Answer these questions on the
paper on which you printed this e-mail?
1. What element is represented by the symbol Ag?
2. What is Ag's atomic weight?
3. What are the characteristics of Ag?
Turn your print out into the science box and e-mail your
answers back to me.
THIS ASSIGNMENT IS DUE BY NOVEMBER 26!!!

Students learned content-area curriculum (periodic table) outcomes and computer skills (retrieving and sending e-mail, Internet addressing and printing) all with one 5-10 minute activity!

Project 2: More complicated, but just as rewarding, is to create your own multimedia presentation. I created one on the ancient Americans for my social studies curriculum. The stack replaced the content from a chapter in the textbook. Over a period of a week, the students worked through five stations, one of which was the multimedia presentation. I was able to go into more depth than I had ever gone before and had more time for one-on-one or small group discussions with the students. Without increasing the one hour slot I usually use for social studies, I was able to delve much deeper into the culture of the ancient Americans. We studied hieroglyphics, social structures, legends, etc.

This same presentation was offered to other teachers to use. The only other teacher to use it was one who also created multimedia presentations. He understood the value. Teachers need to have a sense of ownership in the materials used for integration or they will not be used appropriately, if at all. Handing teachers materials outside their expertise or interest leads to materials that won't be used. Teachers need a sense of ownership in the choice of project, content area and skills to be developed. Otherwise, they can't see or won't see the technology application.

The second requirement to successful integration suggested by Eisenberg is to have a logical and systematic model of instruction. A successful model for technology integration we found in Jerome School District contains three steps. They are model, practice, apply. Model the use of the skills and/or software program to be taught. Practice the skills and/or program in a simple but similar project as modeled. Apply the skills learned to a project that helps the students use the computer with purpose and creativity.

An example is a fifth grade teacher who designed a HyperStudio^[2] project for her students. As they worked through the project, students learned both content and computer objectives (e.g., terminology: stacks, buttons, textbox, graphic, navigate, scroll, etc.). Second, she had her students practice the skills by creating small projects of their own about themselves titled, "All About Me." The skills they learned included creating multimedia, storyboards, text and graphic boxes, and adding transitions. Finally, she had them apply the skills by researching using electronic encyclopedias and the Internet (as well as traditional methods) to create biographies of famous Americans, and then analyzed and synthesized that

information into a presentation.

True integration comes when students learn through computers, not about them. There is no value of learning word processing unless it is used to further content comprehension. Since teachers are the key designers of the school day, they are an integral part of the process of integration. How teachers of the 21st century implement computers into their schools is critical to achieving the benefits of technology in children's learning. Well-trained and competent teachers of the next century will define what integration is and is not for themselves whether they are in pre-service or in-service situations. They will know and understand why basic technology competencies are important. And they will know how to integrate technology using a consistent and well-designed model of instruction. By understanding the what, why and how of technology integration, teachers of the 21st century meet the challenge of preparing students to become proficient information and technology users.

References:

[1.] Eisenberg, M. & Johnson, D. (1996), "Computer Skills for Information Problem-solving: Learning and Teaching Technology in Context," Syracuse, NY: ERK Clearinghouse on Information and Technology (ED392 463).

[2.] HyperStudio, <http://hyperstudio.com>.

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By Jolene Dockstader, Instructor, Jerome School District Jerome, Idaho

Jolene Dockstader, M.Ed., is a sixth grade teacher in the Jerome School District located in Jerome, Idaho.

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