

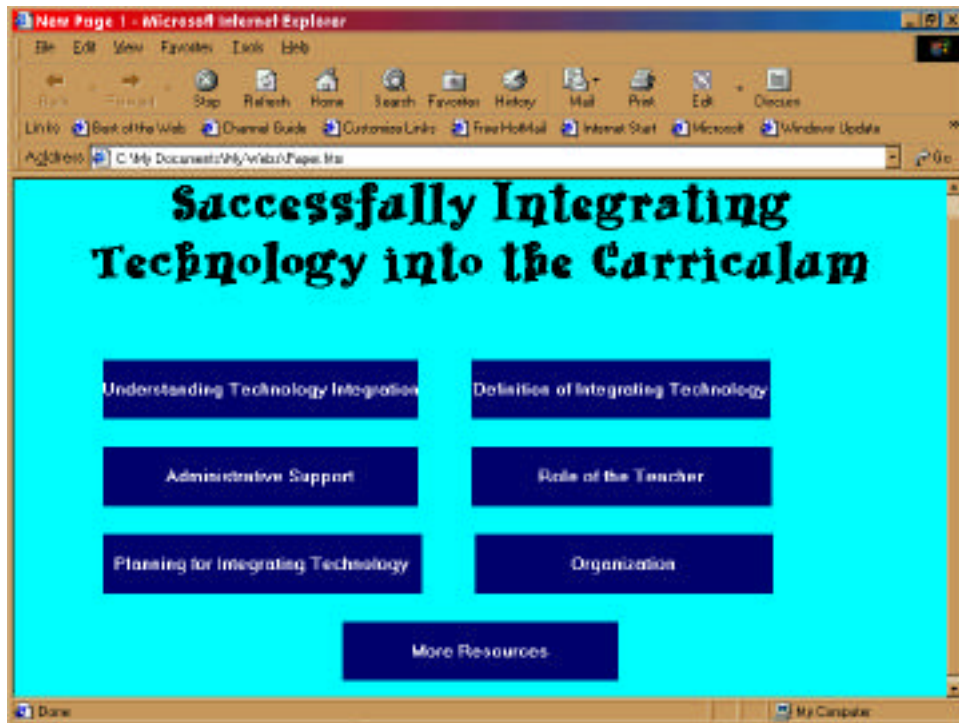
# Integrating Technology into the Curriculum

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*Imagine this scenario. You have just been hired by a principal to teach in a school. The school has a new lab of computers plus one computer in each class, all capable of accessing the Internet. Your new principal expects you to integrate technology into the curriculum. You feel you are fairly average in your knowledge about computers and feel somewhat anxious about the expectation to integrate technology. Where do you start? What does the integration of technology exactly mean? Your principal guides you to a web site on the Internet that is devoted to helping teachers understand how to integrate technology. You eagerly settle in to explore this site.*



## Understanding Technology Integration

What does the integration of technology into the curriculum look like? Is it being able to create a spreadsheet that calculates student marks? How about typing a handout and printing it out for students? Is it having students line up at a computer to complete several levels of a drill and practice software program? My answer is a firm “NO!” Technology is a wonderful tool that can be used to assist teachers and students in the classroom. In fact, teachers should be encouraged to use technology to assist them in their role as teacher. This is an important step towards integrating technology into the curriculum. However the true integration of technology goes far beyond the role of assistant.

Technology is changing at a rapid pace and causing more and more confusion on how to use it in an effective, integrated manner in schools. It seems that there has been a focus on the physical machine when it comes to teaching with computers. In fact, the teaching *has been* teaching computers. Students spend many hours learning how to use software applications or computer science concepts. The question arises should students be learning *about* computers or should you let students learn *with* computers as they learning content related to curriculum objectives. The integration of technology should contribute to the teaching and learning in the classroom. Computers shouldn't be an add-on or used as a time filler. The computer should be a means for reaching the instructional objectives in the classroom. Therefore, the curriculum is the place to start when

integrating technology. The teacher, along with the curriculum, should guide the integration of technology and not the computer.

**Definition of  
Integrating  
Technology**

The integration of technology should serve to guide, expand and enhance learning objectives. It is understood that teachers and students do need to spend time learning the basics of using a computer. This is necessary in order to move to effectively integrating technology.

Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions – as accessible as all other classroom tools. (ISTE, page 6)

## Administrative Support

It is imperative that administrators provide technological support in two areas: technical and curricular. Many times the responsibility of the maintenance and purchasing of hardware and software for computers fall on the shoulders of a teacher in the school. This can become a difficult situation if the teacher is not provided with adequate release time to perform these duties plus it sends a negative message to other teachers. *Don't use the computers because we have to depend on a colleague to rescue us if we have a problem and that person already has too much to deal with.* A knowledgeable technician that is trained to repair computers and deal with networking issues best provides technical support. A skilled teacher can also provide technical support but appropriate release time to deal with this added responsibility is a must. Classroom teachers should be educated on basic troubleshooting measures but should also understand that they are not expected to be technicians.

Administrators must also seek ways to provide curricular support to teachers. Teachers need professional development on integrating technology plus a knowledgeable teacher to work in the classroom with them as they work to find ways to integrate technology. A technology coordinator hired by the school division is often an ideal person for providing curriculum support in the area of technology. The technology coordinator can provide professional development plus mentor teachers in their classrooms. Administrators should also ensure that a professional development fund is in place to encourage teachers to take advantage of conferences and workshops that focus on integrating technology into the curriculum.

## Role of the Teacher

It is obvious that if we expect teachers to integrate technology into the curriculum there needs to be a degree of familiarity with the computer. The question is how familiar? How much does a teacher need to know about computers to effectively integrate them into the curriculum? Teachers don't need to know how a computer works but rather how to use and apply a computer in the classroom. A simple analogy can be used when comparing a computer user to a person that operates a vehicle. In order to operate a vehicle a driver does not need to understand how the engine of the vehicle works, how to repair the vehicle, or even know how to buy a vehicle. It is expected that the driver will know how to operate the vehicle on the road understanding road signs and expectations of drivers on the road. As the driver gains more experience driving, their confidence level increases as well as their skill on the road. When operating a computer a basic level of knowledge is necessary in order to be successful. The user does not need to know how the computer works, how to repair the computer, or even know how to buy a computer. Over time the user will become more experienced and confident with using a computer.

Teachers should strive for two goals when integrating technology. The first goal is to become a computer-using teacher. It may be the producing materials to use in the classroom such as handouts, banners or newsletters. It may be using the computer to manage your students' marks or using a software program to strengthen a particular skill. The second goal is to make the computer a teaching partner rather than an object of study. "The instructional goals of computer-using teachers are in art, science, math,

language arts, social studies, or other disciplines, not in computers.” Geisert & Futrell, 1995

It’s important that teachers have a clear understanding of what technology can and can’t do in the classroom.

Computers can help teachers and students find old information (for example from the Library of Congress Web site) and new information from thousands of sites on the Internet that are updated daily. Computers enable students to view live, synchronous events happening almost anywhere in the world (e.g. MayaQuest) or from space (e.g. the current weather as seen from a satellite). Computers can be used to manipulate data so that students can grasp quickly how a change in one variable in a system affects other variables. Computers enable students to assemble and create new information. Computers enable students to have text, audio, and graphic information that they might not have access to in some less densely populated areas. Computers allow students to communicate with just about anyone, anywhere, and anytime.

Valmont and Wepner, 2000, p. 8

On the other side of the coin computers cannot replace teachers.

“Contrary to the wisdom of the most fanatical technologists, computers do not think, initiate, or react the way teachers do. Although some people believe that information equals education, teachers know that understanding is not automatic with the acquisition or memorization of facts. Knowing how to apply

information, how to use ideas in new ways, how to evaluate information, and how to extrapolate or go beyond basic information are important aspects of learning.”

Valmont and Wepner, 2000, p.9

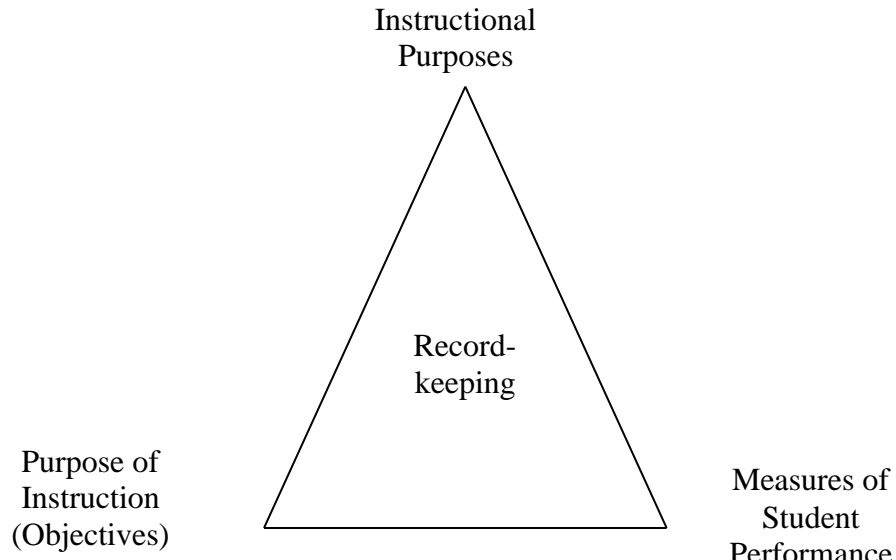
Teachers understand when the teachable moment is at hand and guide students’ academic growth. The teacher facilitates learning and helps students transfer ideas to new learning situations. Integrating technology isn’t about using complex technology programs but rather simplifying technology choices and focusing on how technology connects to learning.

### Planning For Integrating Technology

*Back to the scenario. You’ve spent time pondering what you have been reading on this web site. The philosophy and beliefs about integrating technology make sense and seem to fit into your constructivist views about classroom dynamics. Now comes the hard part. It’s time to sit down and plan the integration of technology before you get into the day to day routine of teaching!*

Unit planning for your classroom begins with consulting the curriculum guides for that particular grade. Lessons are planned around a set of goals and objectives identified in the curriculum. A visual representation of quality instruction can be viewed below:

## A Framework for Quality Instruction



(Geiser & Futrell, 1995, Page 83)

A computer can provide support and contribute in all of the four areas but the most important area to consider is the instructional purpose. “Being able to identify and clearly state your *teaching intent* is a valuable first step in teaming up with computers to teach.” (Geiser & Futrell, 1995, Page 83) The curriculum will serve as a guide and enable you to identify the goals and objectives your students need to achieve.

When you are developing a unit plan include an area for technological integration and list specific activities that you can do to support the objectives of the lesson and involve technology. The specific activities might involve accessing the Internet, using a specific component in a software application to enhance a skill, or the development of an end product using technology.

## Organization

There are generally two scenarios for the physical set up of computers in schools. Some schools have one computer lab, other schools have only small banks of computers in the classroom, and other schools have a combination of both. This section will focus on a computer lab situation and a one computer in the class situation.

### **Computer Labs**

A computer lab is an ideal situation to teach about how a computer works, learn about software application skills, and develop keyboarding skills, all in a large group setting. Generally the teacher presents and demonstrates the skills to be worked on and then students are provided with time to practice and develop the skills. It is important for students to develop basic computer skills but it is easy to spend an enormous amount of time focusing on the computer and software applications in the computer lab. In order for technology to be integrated into instruction the goals and objectives that have been identified in unit planning need to be extended into the lab.

It may mean looking at the lab in a completely different manner than the typical traditional setting. Students do not have to be all working on the same activity in the computer lab. This may be an effective strategy for some lessons but not for others. Consider a lab setting where each student is actively engaged in an activity to enhance or support the learning that has happened in the classroom. Perhaps a small group will be accessing the Internet for information on a report. Another small group is practicing their keyboarding skills. Another group is using paper and pencils to develop a storyboard for a Hyperstudio presentation. Another group is working on a Hyperstudio presentation to

present to their class. The teacher during this scenario is spending time with each group facilitating their learning on an “as needed” basis. Each student is actively involved with a purpose, making decisions that will guide them to the next step to achieve the goals and objectives that their teacher has designated for them.

### **One Computer in the Classroom**

The dynamics of integrating technology will change greatly with one computer in the classroom versus a lab of computers. The obvious difference is that only one person or a small group will be using the computer and the rest of the class will be engaged in another activity.

So, what exactly can you do with one computer in the classroom? There are basically 4 situations that can be arranged to accommodate one computer.

- One computer for personal productivity
- One computer as a presentation tool
- One computer and a group interacting with software
- One computer as a learning centre

Each situation represents a very different look from a traditional classroom and work best within a constructivist classroom.

Using one computer for personal productivity means for both the teacher and the students. Remember in the section about the role of the teacher, it was stated that the first goal is to achieve computer-using teachers. When the technology is close at hand, for example in the classroom, teachers may be more inclined to become computer-using teachers. We want the teacher to use the computer to develop instructional aids and assist with organizational matters. It is important that we don't forget the second goal to make

the computer a partner that regularly integrates technology. Students can regularly access one computer in the classroom if a rotation schedule is setup. Students should have a specific task for their time spent at the computer. This may range from practicing keyboarding skills to researching information on the Internet. A rotation schedule with a specific purpose is preferable to using the computer as spare time filler. In particular, students that never seem to have “spare time” will never be able access the computer and may be missing out on an opportunity to excel in technology. One last point to ponder comes from David Dockterman (1998), “The computer entered the world of education with lots of hype and exaggerated claims. The focus was on getting the computer into the hands of individual students. Well, I say get it into the hands of teachers; they will figure out great ways to exploit its power.”

Using the computer as a presentation tool offers a wide range of possibilities for integrating technology. From the research, to the design and organization of the information into a presentation program, to the actual presentation whether it is oral or self-executing. The individual teacher may go through this process in order to develop a presentation to present a lesson. The teacher with the whole class may go through this process in order to teach and model the development of a presentation within the context of a particular unit of study. Individual students or small groups of students may go through this process to extend learning about a particular concept. In all, using one computer to develop a presentation is a powerful motivator and provides students with a real opportunity to connect their learning with technology.

Using one computer with a small group of students and having the group interact with software is another possibility in the classroom. There are thousands of software programs that have claims to being educational. Software that has been reviewed by teachers and linked with specific curriculum objectives are a good choice for the classroom. It is important that the classroom teacher review the software before introducing it to the students. It's not necessary to become an expert on using the software, the students will aspire to become the experts, but to ensure that curriculum objectives are being met.

Using one computer as a learning center is useful when the classroom has other activities set up for students to use. This is an excellent way to connect the learning in the class with technology. Students may be using software related to a topic in class, developing a project, or using the computer as a research tool. It is important that students have clear expectations about the use of their computer time in order for it to be used effectively.

### More Resources

*Scenario: Now you have a better understanding about how your principal expects you to use technology in your classroom. You understand that developing your own computer skills is important but more important is your creative ability to find technology links with the goals and objectives you are expected to cover in the curriculum this year. You thank your principal for directing you to this informative site and ask if she has any other web sites she could suggest for resources. Your principal smiles, pleased with your*

enthusiasm, and suggests the **Technology Resource Centre** at

[www.dlcwest.com/~tech\\_teachers](http://www.dlcwest.com/~tech_teachers) This web site is being developed by the school

division's technology coordinator and promises to offer some exciting ideas for

integrating technology. Off you go to explore this new site.

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