Video in the Classroom: Learning Objects or Objects of Learning?

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Introduction

The insurgence of technology in educational settings has sparked considerable confusion and controversy over the definition of learning objects and how to best to utilize them in an instructional environment. The basic conflict stems from the perceived function of a learning object; is it better to learn *from* or *with* the object? When students learn from technology, they passively acquire knowledge from presented information; when they learn with technology, students actively use the learning object. Proponents of learning from technology would advocate using television shows such as *Sesame Street* and *Between the Lions* to help young readers develop readiness skills. David Jonassen, a proponent of learning with technology, proposed the idea of utilizing technology as mindtools to assist students in expanding their cognitive capabilities. After analyzing these varied perspectives, it is clear that both methods have educational merit and that digital media can play a dynamic role in unifying these diverse schools of thought. Until recently, the definition of the term digital media has been so encompassing that, quite often, digital media producers found themselves creating solutions in search of problems to solve. Contrasting that is the fact that there are those who characterize learning objects and mindtools too narrowly and the result is that all parties are missing an unparalleled opportunity to re-look at these paradigms in an effort to bring them together into a unified framework and discover solutions to problems that already exist.

Learning Objects Defined

The term learning object originates from another term generally associated with computer programming, object-oriented programming (OOP). In object-oriented programming, an object is defined as an object is a unit of code that is eventually derived from the process of designing code in such a way that each unit both performs a function in the code and can stand alone to become an instance of a particular class or subclass of methods, procedures, or data variables (Montlick, 1999). Watson (2001) stated that learning objects were reusable objects that were designed for a specific purpose to facilitate learning and could be categorized by using metadata. In other words data about data. This categorization enables users to search for, access, and reuse objects as needed.

In their paper *Learning Objects*, Todorova and Petrova (2003) stated there are multiple definitions of learning objects. L'Allier (1997) stated, "A learning object is defined as the smallest independent structural experience that contains an objective, a learning activity and an assessment" (p 2). In a broader scope, anything can be an object (i.e., human being, buildings and even items like buttons, icons and scroll bars), as long as they demonstrate certain characteristics. In data modeling, objects are defined and relationships between them are established. To be considered an object in programming, that unit of code must meet fairly strict definitional standards, such as being sharable and reusable models. Because they are reusable they can be reconstituted to run in most circumstances. Like interchangeable network connections, new objects are easily defined without the need to know the logic needed to run them, as long as these common gateways are defined.

Over time, however, new paradigms and broader definitions for the use and definition of objects have emerged. They have become part of more complex and multifaceted technological constructs and incorporated into new disciplines such as information technology, educational psychology, and instructional technology. In the educational realm, objects have also been referred to as *instructional objects*, *educational objects*, *intelligent objects*, and/or *data objects* (Gibbons, Nelson, and Richard, 2000).

Like their programming counterparts, the most common definition for learning objects indicates that they are also model-based, modular, interactive in nature, and can serve various instructional needs. They can be effective solutions in many instructional domains such as problem-based learning, functional analyses, coaching and feedback, logic, and many of the so-called constructivist approaches (i.e., student learning management, recording of responses and selections, etc.). Like those defined in the computer sciences, to be considered an *object*, they must be generative, scalable, adaptive, and more.

The adoption of learning objects in the educational community has not been without controversy or misunderstanding. Educators have disagreed, for example, on whether a learning object need be a finished product like a video clip or whether any tool used in the creation of an instructional unit might be considered a learning

object. The debate essentially boils down to differences between the way educators understand and differentiate the two terms *informing* versus *instructing*. The former is a necessary but insufficient and not a complete condition to learning. Generally it is accepted that, to be an effective instructional tool, an artifact must also foster the actual transfer of knowledge (or cause a change of action or effect attitude) in a structured way that somehow resembles an organized taxonomy like Bloom's. This is the exact rationale many use to argue that the World Wide Web itself is a classic *non-example* of a learning object. While many educators promote the Web as a learning tool that fits many of the criteria of learning objects (certainly the Web is reusable and scalable), others believe there are serious questions as to whether it fully provides the requisite design concepts, architectures, and tools that make it a valid instructional channel rather than being merely a reporting mechanism (Fairweather & Gibbons, 2000). Another *non-example* often held up as a role model for learning objects is the computer itself. While computers can generally free students to adjust and tailor similar tasks to their individual needs, without some type of mediated structure, they mostly generate random activity without attaining any meaningful instructional benefit. It has been the role of the digital programs (i.e., media) to turn the computer into a learning object.

Lack of a Precise Definition

Much of the misunderstanding concerning learning objects can be traced to a specific learning theory that the particular researcher subscribes to and has based their definition or analysis. Further complicating things is that learning objects are often incorporated into general instructional design domains that view them as finished products or specific sub-sets of an instructional lesson, rather than a tool for learning. In an attempt to sort things out, Merrill (1999) classified four types of 'knowledge' (i.e., learning) objects. He defined *entities* as devices, persons, places, and symbols; *properties* as quantitative or qualitative attributes of entities; *activities* as actions the learner can take and, *processes* as events that occur and cause change. Merrill (1999) defined the attributes of learning objects as the medium used to deliver them. In this view, the same knowledge objects can be theoretically reconfigured to construct different types of ways to inform, encourage practice and rote skills, and/or guide learners. While these classifications appear to be outside the bounds of the original definitions and their uses they were intended for objects in the OOP domain, they make sense and are clearly definable. Instructional technologists have never been able to describe learning as precisely as computer scientists have been able to with programming statements, due to the various ways individuals learn. Clearly a case for a more open-ended definition needs to be made.

Another problem with settling on a more precise definition for learning objects is that many feel that the role most often referred to in the analogies used to describe them does not quite fit the precise parameters originally used by programmers to describe object models in the computer science domain. Such products like *Lincoln Logs*™, *Erector Sets*™, and *Legos*™ readily come to mind. The confusion is exacerbated by the fact that these toys fulfill only some of the criteria associated with learning objects as per their more precise definitions:

- They all contain units or objects of the smallest, fundamental size possible to be of use.
- They can be assembled into literally any shape and size, and used for a multitude of functions.
- Their use is very flexible in that some learners or instructors can use partially pre-assembled units made up from smaller pieces of these core units and immediately put them to use.

Upon further review, these toys are more like programming objects than some would like to admit. For example, each has elements that may be used and applied and/or built into various new structures without decomposing the individual units so they can be reapplied or reused later. Others can assemble structures completely on their own from scratch without the use of any pre-fabricated portions. Furthermore, they fit well into the instructional domain because most of them can be totally self-sufficient in their use, even though some may need instruction and guidance on how to assemble these parts into final products. The fact that they are malleable speaks to the fact that they can also be used as tools to spark cognitive development. The fact that they can be used in their pre-fabricated form speaks to the fact that they better fit Merrill's broader definition and scope of learning objects, but might not by those who would view learning objects narrowly as finished units or snippets of media that are incorporated into a larger whole.

Some terms that have come from the literature are instructional object, educational object, learning object, knowledge object, intelligent object, or data object, however, the long range analysis of learning objects or the purpose is to facilitate learning. For this article, learning objects will be defined as instructional objects that are multifaceted, multifunctional, reusable tools that take on many different shapes, constructs, and context. They are technology objects of learning that can assist with the learning process. In the context of this study, students learn *with* the technology not *from* the technologies.

Literacy and Learning in the 21st Century

As we enter the 21st century, literacy remains the most fundamental aspect of education. To develop literacy, educators must infuse literacy instruction throughout the education process so students can become better readers, writers, and content learners. Using scientifically based research, five essential elements for developing good readers have been identified. They include phonics, phonemic awareness, vocabulary, fluency, and comprehension (U.S. Department of Education, n.d.). According to President Bush (2001), "...the most basic educational skill, and the most basic obligation of any school is to teach reading" (¶ 3) However, in the 21st century, reading is by no means a complete definition of literacy.

From the simplest time of learning what educators called the "Three R's" to the more inclusive definition of today, literacy has always been a vital part of education curricula (Serim, 2003). In its most basic form, literacy can be described as the ability to read, write, listen, and speak as well as critically analyze and express ideas using a variety of media or learning objects. However, if we are to define literacy in the context of students' being able to thrive in today's digital age, we must expand that definition (NCREL & Metri Group, 2003). In addition to basic literacy, students are expected to attain proficiency in scientific, economic, technological, visual, information, media, and multicultural literacy (NCREL & Metri Group, 2003) so that they are able to be productive citizens in a technology rich 21st century.

North Central Regional Educational Laboratory and the Metiri Group (2003) asked, "Are your graduates ready to thrive in today's Digital Age? Upon serious reflection, most schools must answer with a resounding, No!" (p 4). As the CEO Forum on Education and Technology (2001) concluded in *Key Building Blocks for Student Achievement in the 21st Century*, the definition of student achievement must be broadened to include the 21st century skills. Since this report came out, two major initiatives have conducted extensive research and published major reports in 2003: the *enGauge 21st Century Skills: Literacy in the Digital Age* from the North Central Regional Educational Laboratory and *Learning for the 21st Century* from the Partnership for 21st Century Skills (North Central Regional Educational Laboratory, 2003; Partnership for 21st Century Skills, 2003). In essence, educators, businesses, and industries partnered to develop a model of learning that would help public education systems assist students in gaining the skills needed to succeed in the 21st century, often referred to as the digital age or media age. They came up with six elements called 21st century skills. The first two elements emphasize core subjects and learning skills. These elements focus on improving learning by infusing information, communication, critical thinking, and problem solving skills within existing school curriculum. The latter categories incorporate 21st century tools within learning skills, context, content, and assessment. The model encourages educators to integrate today's technology with real-world situations so students can develop needed skills with practical applications. (Partnership for 21st Century Skills, 2003). Most importantly, the reports stress that we must bridge the gap between the knowledge and skills most students learn in school, the way those skills are acquired, and the knowledge and skills that they need in 21st century communities and workplaces.

The youth of today are inundated with technology that has the potential to extend literacy and allow them to actively participate with a variety of media (NCREL & Metri Group, 2003; Serim, 2003). Sixty-five percent of children in the United States are already online and the U.S. Department of Commerce estimates the current growth rate for Internet use at 2 million new users per month; the majority of which are children and teens (NCREL & Metri Group, 2003).

The world in which our students live is significantly different from the past. Today's students use cell phones, pagers, instant messaging, PDAs, and laptops to connect to friends, family, and others in their community and all over the world. Our students now have at their fingertips a digital virtual world – with all its promises and pitfalls. Technology can be a valuable tool to achieve instructional objectives if integrated into the curriculum appropriately. When combined with the other key factors that increase literacy and student achievement, such as clear and measurable objectives, learning objects that increase knowledge, increased time on task, frequent feedback and teacher subject matter expertise; technology can help deliver significant and positive results.

Technology as Effective Learning Objects

There is considerable evidence that children are born with right-brained cognition, which is aided by media, while left-brained cognition has to be developed with the aid of text (Doman, 1984; Shihida, 1994). In order to effectively function in the world, students must learn to balance right and left-brained cognition. Robert Doman (1984) has suggested that the most effective way to create this balance is to teach to strengths and remediate weaknesses. Students that lack appropriate literacy skills will not develop these skills just because they are given another book to read, especially if text-based communication is a weakness.

Increasingly, educators are beginning to utilize methods of instruction that include the student's right-brained strengths by integrating learning objects into the traditional curriculum. As stated earlier, learning objects are considered instructional objects that are multifaceted, multifunctional, reusable technology objects of learning that can assist with the learning process where students learn *with* the learning objects. The term learning objects may encompass a large array of digital resources from digital images to entire Web pages. Computers, videos, DVDs, the Internet and television are popular learning objects that are changing the dynamics of learning and by combining moving pictures and audio have the ability to appeal to a variety of learning styles

The success that these learning objects will have in developing 21st century literacy is largely dependent upon the method of integration employed by the teacher. According to Dr. Thomas Reeves (1998), there are two distinct styles used to integrate media into the classroom; students can learn *with* technology or *from* technology. When students learn from technology, they passively acquire knowledge from presented information. Children are exposed to the media; then, it is assumed to that they have gained the desired knowledge because they can respond appropriately. In order for students to use technology as learning objects that they can learn from, the technology must stimulate critical thinking and promote higher order learning skills. The students must use the media tools to access, analyze, interpret, and present their constructed knowledge (Reeves, 1998).

Recent improvements in digital media, digital video in particular, have changed the entire learning landscape. We are rapidly moving from a time where students learn from media to an era in which they are highly motivated to learn with media. The job of educators is to create an environment conducive to learning from a variety of media by ensuring that the employed media correlates with the curriculum and that students are active users of the media (Bransford, Klee, Michael, & Warren, 1993).

Video in the Classroom

According to John Keller's (1983) ARCS motivational model, if you gain a student's attention, make the concept relevant, offer a valid challenge, and provide an avenue for **s**uccess, there is an increased opportunity to elicit positive change in the academic success of the student. Today's generation of students is not strangers to video media; everything from their cell phones to their video games uses some type of digital imaging to gain their attention. Therefore, it would seem logical that using digital video cameras in the classroom would motivate students to engage in the writing and reading process, which in turn could increase literacy.

That motivational model, coupled with advances in technology and increased knowledge of true integration is causing significant transformations in the way students are developing literacy. More educators are starting to use video cameras and non-linear editors as instructional tools that help students develop the skills they need to meet state standards. Editing products, such as Apple Computer's iMovie, have transformed the use of video to the point where even younger elementary students are capable of creating digital stories.

Fifth grade students at Sabal Point Elementary in Longwood, Florida use video production projects to gain a better understanding of complex concepts while developing reading, writing, listening and speaking skills. During the 2004-2005 school years, the 5th grade students made several multimedia projects as they explored the concept of democracy and the presidential election. Working in three clusters, the students were challenged to create their own political parties, develop their own set of relevant issues, choose a presidential and vice presidential candidate and then persuade University of Central Florida (UCF) College of Education, educational technology graduate students to judge the speeches and issues and then vote for each of the candidates.

The students from Sabal Point never had any direct contact with the UCF students; their only medium for communication was the World Wide Web. The project began with the 5th grade students reading a book from the 5th grade reading list titled "The Kid Who Ran for President" written by Dan Gutman that meets state standards and was an excellent way to get students relating to someone their age running for president. Next, the students had to research the complete electoral process. Then, students wrote their campaign speeches, which had to be based on a platform with issues which symbolized what their party represented in the campaign. The students also had to write campaign slogans, create flyers, and come up with ways to earn campaign funds. The 5th grade students used digital cameras, digital video cameras and iMovie to film and edit videos of their campaign speeches which expressed their opinions, newscasts that broadcast their platforms, political advertisements that they used to persuade voters, and debates that they hoped would discredit their opponents. The students used Microsoft Publisher and MS Word to create a Web page and online newspapers that would help propagate their issues. The interdisciplinary and cross-disciplinary curriculum of these lessons created learning opportunities for students to not only learn content and meet learning objects but also interact with technologies as they learned the content.

The same students that did not typically do well reading a textbook or listening to a lecture, flourished in the classroom because they were actively engaged in a project that had meaning to them. One student remarked, "I don't mind learning if its fun, I just don't think learning should seem like work all the time." Through this project,

students were motivated to learn a variety of research, writing, critical thinking, and decision making skills. They followed the election coverage using television media, the Internet, and newspapers. Students gathered information, analyzed various points of view, and made decisions about how to run their own campaign. Students wrote and edited scripts, assigned tasks, worked cooperatively, and managed other students cooperatively.

The writing process remained the same, but become less tedious when the traditional paper and pencil was replaced with a video camera.

Table1 *Comparison of Traditional and Video Writing Process*

1. Prewriting- brainstorm, gather information, take notes, outline	1. Prewriting- brainstorm, gather information, take notes, storyboard
2. Drafting- put your ideas into sentences and paragraphs, make sure that there is a logical beginning, middle, and end	2. Drafting- use the video camera to put your ideas in a logical format, make sure that there is a beginning, middle, and end
3. Revising- read your draft, make sure that it has a clear focus, stays on topic, and is appropriate for the intended audience, add or delete any necessary parts	3. Revising- view your footage, make sure that there is a clear focus, a consistent topic, and that it is appropriate for the intended audience, delete any unnecessary footage, shot any necessary additional footage
4. Editing- check for grammar, sentence structure and spelling	4. Editing- put clips in order, add transitions and necessary audio
5. Publishing- prepare a final draft	5. Publishing- create a QuickTime video, upload to the Internet

These conceptual frameworks are not original; however, interactive media is clearly the language of the students of today. Paula Monsef (2003) in the Digital Divide Network stated, "Students who may not take to learning by reading a textbook or listening to a lecture often jump at the chance to understand complex concepts by presenting finished products in the form of a film or a Web documentary or a PowerPoint presentation." We are already seeing this in the county school districts around UCF and all around the country.

Don Henderson and Marco Torres, both Apple Scholars, have been working with students with projects just like these for quite some time. They have expanded these concepts beyond reading and writing to other subjects, including curriculum areas important to social studies, applied mathematics, and physics. Similar projects have been showing up in other cities like San Antonio, Texas, and Orlando, Florida. In a suburb of Orlando, ESTEEM is a local volunteer organization providing neighborhood based programs to children and their families that focus on literacy, academic and employability skills training. They have developed a project called *Picture It, Write It*! This program starts children out with simple storyboards of photographs and/or drawings and challenges children to write about them. The program evolves into using video footage shot by the participants that allows the participants to develop more complex storylines. Another program underway in local K-12 schools is called *UB the Director*, where students are taught how to read books for content by teaching them the text -to-screen essentials of film script writing so they can eventually make movie trailers from the books they are reading. These are just a few of the programs that are beginning to develop showing that digital media can make a difference in the learning process.

Summary

The goal of the video in the classroom video project at Sabal Point Elementary was to increase student achievement *with* the technologies by making learning come alive to students, have learners actively engaged in the process of learning through authentic learning experiences, and make that learning have meaning to their lives through the process of learning *with* the technologies. Students are researched, wrote, created scripts, newsletters, flyers, and a variety of other projects that far exceeded the typical paper and traditional classroom assignments. Fifth grade students created group video literacy projects for book reports, point of view story retellings, and election coverage. Their latest literacy project was a community service documentary; students recorded and scripted their efforts to assist the victims of the 2004 Florida hurricanes. Their teacher, Ms. Brandi Evans, stated the students'

literacy skills have improved. Students are motivated to read more and complete assignments when the outcome is doing something that they enjoy instead of another test.

Students learning *with* technologies, such as digital video, incorporate the most important aspects of the language arts curriculum; reading, writing, listening and speaking into every assignment all while developing literacy and using a familiar medium. In order to write scripts, students have to retell events and facts in a logical and sequential manner in addition to summarizing and synthesizing facts from various sources; the ability to complete this task is a key indicator of comprehension. Students also gain fluency as they begin to perform their scripts and they learn self-correct skills because they see and hear mistakes that they might not have caught if they read their scripts alone.

Teachers also benefit from using video in their curriculum because they are no longer assessing students' recall of obscure facts. Video is an opportunity for teachers to conduct authentic assessment of the students' critical thinking skills. The teacher has the ability to monitor the students as they research and see where students' misconceptions are as they begin to write and perform; the teacher can then clarify or remediate immediately.

Although the concept of how learning objects should be integrated into educational curricula still remains a source of controversy, it is obvious that digital media is the language of this generation of learners. By teaching students to learn *with* technologies, as opposed to learning exclusively *from* technology, educators are helping to equip students with the 21st Century literacy skills that they need.

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