

iPod in Education: The Potential for Teaching and Learning

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iPod in Education: The Potential for Teaching and Learning

In the last decade, technology has moved from the periphery and into our everyday lives, becoming a pervasive part of how we live, work, and learn.¹ Networked communications and computer technology have transformed the modern workplace, touching nearly every career and job category. Lifelong learning and versatility are replacing lifetime employment and static skill sets. Reflecting these dramatic changes, schools, too, are evolving, altering their educational goals as well as the strategies and resources they use to achieve these goals. Educators at nearly every level are examining the tools required to produce the 21st century skills today's students need to succeed in their school, work, and civic lives.

Innovative educators, from instructional leaders working in state capitals to classroom practitioners responsible for a single set of students, are exploring how iPod can serve as a powerful educational tool in teachers' and students' efforts to achieve 21st century literacy. What they are discovering is that iPod presents a number of educational affordances; for instance:

- Because iPod is *portable*, it can take learning beyond the boundaries of the classroom.
- Its fit-in-your-pocket ease offers *anytime, anywhere* opportunities for teaching and learning.
- With the creative support of iLife, it can help foster students' *information, visual, and media literacies*. (The iLife software suite comes with every new Mac computer.)
- It enables teachers to promote *collaborative, independent, and differentiated learning*, adapting to the needs of each learner.
- As a professional development tool, it expands opportunities teachers have to strengthen their understanding of the subjects they teach and widen the repertoire of the instructional strategies they use.
- It is *inexpensive* relative to laptop and desktop computers.

Much of the educational potency of iPod stems from its integrated nature. Whether functioning as an audio and video player that delivers compelling rich media or as a device that stores and transports student-produced content, it both depends on and is enhanced by Apple's suite of educational offerings. iPod operates as a standalone tool and it works in tandem with the authoring potential of iLife and the organizing dexterity of iTunes. Together, these tools have the capacity to support the development of a wide range of student skills and teaching strategies. And describing how iPod functionality supports these particular skills and strategies is the aim of this paper.

Audio and Video Player = Multidimensional Learning

At its most basic level, iPod is an audio and video player. Because of its capacity to deliver rich media content, it also is a cognitive and cultural tool that allows students to explore symbols and meanings. As a result, some of the device's greatest potential lies in its ability to expand notions of literacy. Whether acquired through the iTunes Store, selected from the Podcast Directory, or downloaded from another online source, iPod educational content can:

Seven principles characterize the potential of rich media content for learning.

- Deepen students' *content knowledge* by exposing them to high-quality visual and aural representations of places, people, events, and concepts they may not otherwise experience
- Hone students' *critical thinking and information literacy*
- Provide teachers with opportunities to promote *media literacy* rather than compete with the popular media students consume during their out-of-school time

From the standpoint of teaching and learning, iPod and content available through the iTunes Store also is understood best within the broader context of learning with media. Richard Mayer has examined cognitive theory to support the idea that multimedia can help people learn more effectively and meaningfully.² He has identified seven principles that characterize the potential of rich media content for learning:

- *Multimedia Principle*: Students learn better from words and pictures than from words alone.
- *Spatial Contiguity Principle*: Students learn better when corresponding words and pictures are presented near rather than far from each other on the page or screen.
- *Temporal Contiguity Principle*: Students learn better when corresponding words and pictures are presented simultaneously rather than successively.
- *Coherence Principle*: Students learn better when extraneous words, pictures, and sounds are excluded rather than included.
- *Modality Principle*: Students learn better from animation and narration than from animation and onscreen text.
- *Redundancy Principle*: Student learn better from animation and narration than from animation, narration, and onscreen text.
- *Individual Differences Principles*: Design effects are stronger for low-knowledge learners than for high-knowledge learners and for high spatial learners rather than from low spatial learners.

Content Knowledge

iPod educational content has the potential to extend and reinforce students' understanding of content areas in specific disciplines. Not surprisingly, coordinating use of multimedia resources with existing curricula is key to ensuring effective integration. As Sholly Fisch has observed, "If the materials (no matter how educationally rich they may be) do not map onto the curriculum that a teacher is obligated to meet, then the materials are likely to be treated as a nice 'extra' to be used only if time permits."³ When media content has been linked to specific learning goals, it has been useful in a wide range of subject areas. For example:

- Teachers value authenticity and accuracy in video featuring historical content. Video with historical themes can contribute to student learning by: “1) Bringing a subject to life, e.g. by ‘recreating images from the past’; 2) Stimulating students’ interest through the use of media production techniques, as well as their attention and motivation; 3) Stimulating recall of factual information; 4) Enhancing skills and concepts (e.g., listening, demonstrating, questioning); and 5) Improving students’ confidence and teachers’ credibility.”⁴
- Studies focusing on science education suggest the benefits of simulations, computer-based laboratories, and video to anchor instruction to real-world problems, and software that targets students’ misconceptions.
- Video is especially effective when the skills and concepts to be learned have a visual component and when the software incorporates a research-based instructional design.
- Animation and video can enhance learning when the skills or concepts to be learned involve motion or action. Also, animation accompanied by spoken narration is generally superior to animation accompanied by explanatory text.
- Content-related graphics (both static and animated) and video can help improve student attitudes and motivation in mathematics and science.⁵

iPod allows students to hone critical thinking skills and build information literacy.

Critical Thinking and Information Literacy

Because audio and video content can expose teachers and students to primary source materials, such as oral histories of Works Progress Administration (WPA) artists in the 1930s and Civil Rights activists in the 1960s, iPod presents opportunities for students to hone their critical thinking skills. As primary resources have been converted to online archives, teachers have had greater access to these digital versions. For example, at Georgia College and State University, where experimentation with iPod happens campus-wide, professors have included audio recordings of songs about war and peace ranging from Civil War ballads to World Trade Center musical memorials. Although a large-scale study of teachers’ use of digital archives has not been conducted, some small studies present a picture of how these resources have had an impact on teaching and learning. For example, the American Memory fellows program was designed to bring together teams of middle and high school educators to develop, test, and publish innovative classroom activities that use online primary-source collections from the Library of Congress. One of the goals of the program was helping teachers and students build the “information literacy” necessary to interpret these resources effectively. Citing their previous classroom research, Bill Tally and Melissa Burns write, “Students who use primary sources exhibit more of the traits we associate with good historical thinking: they pose questions, observe details, and speculate about context —about what was going on behind the documents.”The authors also recognize the need for teachers and students to acquire help “sorting out which online material is relevant, how to locate and evaluate useful texts, and how to apply what they have found to their questions or problems.”⁶

As students encounter greater numbers of primary source material—something teachers can encourage with the aid of iPod—they not only learn to ask questions about the substance but also learn to engage in what librarians customarily refer to as information literacy. They form the habit of identifying appropriate sources, finding, evaluating and/or synthesizing information, and/or using it in a product.⁷

iPod allows teachers to promote media literacy.

Media Literacy

Popular culture is infused with digital images and sounds. As a result, with little to no effort, children are introduced to the grammar of digital media, each day encountering various video and audio structures, genres, and formats. Although they may not know how to question what they see and hear, students come into the classroom possessing a vernacular literacy of media. And, as Bronwyn T. Williams has noted, these informal literacies "...can be gateways to otherwise hidden student knowledge about the society and culture at large."⁸ She calls on teachers to "make students aware of how experience with any form of communication, be it television or print, leads to a deeper, critical enjoyment of that form and ability to use it more effectively for their own goals."⁹

Within iTunes and iPhoto, students' personal collections of media can blend with artifacts they use in their studies. A library of digital images taken at a family reunion, for instance, can sit alongside a slideshow of Civil War battle photos assembled for a Social Studies project. Likewise, popular music downloads from iTunes Store can bump up against a playlist of selections from 1940s migrant workers included in *Voices from the Dust Bowl*. As students move content between their iPod players and iTunes, the intermingling of the personal and the academic may lead them to pose questions about evidence, bias, point-of-view, and context. Students might wonder, "How and why were these different media expressions produced?" "What makes them appealing now and in the past?" "Who is or was the intended audience?" And, "How does one media file change what I know about another?"

iPod offers teachers opportunities to promote active listening and viewing, or what many have labeled *media literacy*. Conversely, exposure to potentially "educational media," like historical documents, however, is not enough to secure students' media savvy. Previous research has shown that in the context of casual effortless viewing or listening, learning tends to be shallow and short-lived, but when use is more purposeful, deeper and more sophisticated learning can occur.¹⁰ The Center for Media Literacy's full definition of media literacy is the "ability to communicate competently in all media forms, print and electronic, as well as to access, understand, analyze and evaluate the powerful images, words and sounds that make up our contemporary mass media culture." Media literacy projects, like "National Geographic Unplugged," can become the norm in science classrooms equipped with iPod players and a collection of digital video. The project challenged students to use video clips from nature films to analyze and provide scientific explanations of visual data they contained.¹¹ According to the project's designer, students studied nature films to learn about behavior in the same ways that behavioral ecologists study animals in their natural habitats.

Storage Capacity + Authoring Tools = Personalized Learning

Among consumers and educators alike, iPod is emerging as something more than a well-designed audio and video player. In addition to syncing with iTunes, which not only gives students the freedom to store music, audio files, still images, and video, but allows them to review, sort and organize these mixed media as well, teachers can pair iPod with iLife, a powerful suite of authoring tools. The hands-on quality of iTunes and iLife, which includes iMovie HD, iPhoto, GarageBand, iDVD, and iWeb, signals to young people they have the right to personalize the media products others have made and, more importantly, the tools to create their own productions. As a result, students can discover they are more than content consumers, however well informed; instead, they are content creators. Experimenting with the trio of iPod, iTunes, and iLife can:

- Help develop students' skills of *self-expression* and *creativity*
- Support students' *portfolio content creation*
- Promote *communication* with students' peers and family

Self-Expression and Creativity

From students at Willowdale Elementary School in Omaha, NE, who “willowcast” Radio WillowWeb to their K-5-grade peers, to 12th-grade Comm Tech/History students who produced the short film, *Never Shall I Forget*, to honor survivors from Auschwitz-Birkenau and Dachau concentration camps, personal broadcasting allows students to express themselves and explore their creativity. Working both independently as well as in groups, these media production projects mirror the work that youth media groups have been doing since the early 1990s before digital storage was readily available. For example, educators at the Educational Video Center, a New York-based after-school art center, follow a methodology that includes the following:



- Actively engage students in authentic, real-world tasks about issues that are of interest to them
- Facilitate small group, collaborative work so that each student can serve as a resource and amplifier for their peers' learning
- Organically link the processes of student creative media work and critical analysis
- Teach students abstract concepts through the habitual joining of observation, experience, and discussion
- Routinely use visual, print, and aural literacies for learning and expression
- Share student-produced media work with school and community audiences for learning and discussion
- Incorporate student reflection and self-assessment throughout all work¹²

Teachers now can bring this same pedagogical approach to classroom-based media production projects, arming students with iPod players as well as creative software found in iLife, such as GarageBand and iMovie HD.



Never Shall I Forget

Portfolio Content Creation

Using iPod as part of a system for saving the creative work students produce offers distinct educational benefits as well:

- To save the work is to place an inherent value on it—it signals to students and others that the work matters.
- It helps to track individual progress and experimentation, which can serve as the basis for evaluation.

- Preserving work samples is a way to demonstrate to those outside of the classroom, from peers to parents to other educators, the growth and skill development students have experienced over time. And, in doing so, it can invite these other people into the learning process. For example, students may use iPod and an attached microphone to interview family members, and this oral history can become an artifact in the portfolio.
- It provides a place to turn when a student is stuck and has difficulty coming up with new activity ideas. In reviewing multiple digital portfolios, teachers learn to develop follow-up activities that might not have occurred to particular students. A follow-up activity, for instance, may involve publishing a podcast on the web in order to generate feedback from a broader audience.

iPod can be a tool for communication with students' families.

Communication

As mobile devices capable of storing rich audio and video clips as well as student-produced multimedia files, iPod also can invite parents and other family members to experience firsthand what their students are studying and discovering. As Brian Street explains, "Literacies are always situated in particular communities and particular practices." Encouraging young people to engage in conversations about what they see, hear, and make at school further connects their home experiences to their formal learning.¹³

In the case of Language Studies, iPod also can extend classroom learning into students' homes. For example, in using video to support language development, successful teaching strategies include providing copies of the video to parents so that they, too, can improve their English.¹⁴ Digital files, such as an audio podcast directed at English Language learners, similarly can further enhance communication skills and allow parents to become active partners with their children.



Pocket Size = Portable Learning

Like much of the equipment connected to 1 to 1 Learning programs, iPod breaks free of restrictions typically associated with traditional computer labs. Quite often, a school's technology tools are consolidated in a lab that is both wired and location-specific. While this setup allows students to use all of the schools' equipment at once, it limits teachers' ability to integrate technology into the classroom curriculum.¹⁵ iPod offers an entirely different model of "learning on the go." Its "fit-in-your-pocket" portability helps:

- Promote *independent learning*
- Support *collaboration* among learners

Independent Learning

As educators know, students must "learn how to learn" and identifying which formats are most effective with which students is a part of this process. Creating opportunities to provide meaningful reinforcement of subject area concepts is one important aspect. As Harouna Ba and Bill Tally, writing about digital literacy, note, "A skill may be taught at school but it is at home that that skill is fortified."¹⁶ Rather than having the teacher make all instructional decisions, offering students control over the amount and sequence of instruction, including options for review, can result in higher achievement and improve student attitudes toward learning. iPod, with its virtually limitless opportunities for

Teachers can use iPod for student collaboration.

playback, literally places control in students' hands. Indeed, one of the fundamental characteristics of rich media, like downloadable audio and video files, is that they enable teachers and students to take an active role in building their own narrative, becoming producers and makers of meaning as they choose their individual learning path.¹⁷

Collaboration

In addition to providing students with opportunities to personalize their use of media, teachers can use iPod to get students interacting, which requires them to confront one another's strengths, ideas, opinions, and content understanding. The authoring software within iLife, in particular, invites students to work in production teams where they can produce audio podcasts, websites, musical tracks, documentaries, and slideshows. Rather than assigning students tasks that place them in isolation, teachers can use software, like GarageBand and iMovie HD, to create academic and social mash-ups. Although outlining, storyboarding, shooting, editing, and publishing a video to the web are discrete production steps, when students work together to complete them, they find they must negotiate and co-construct knowledge. For example, in "Environmental Impacts," high school students in Oregon worked with one another as well as a local community organization to produce a documentary about the human and natural history of a stream basin.



Environmental Impacts

Simple Design = Pervasive Learning

iPod offers anytime, anywhere opportunities for learning. In addition to enhancing student's content knowledge, iPod educational content can contribute to other student outcomes as well. For example, teachers have reported their use of video in the classroom has resulted in both better accommodation of diverse learning styles and increased student motivation and enthusiasm for learning.¹⁸ The simple design of the device and the peripherals that it can accommodate, promote:

- *Differentiated learning* by taking advantage of multiple modalities to deliver content
- *Time management* skills among teachers and students

Differentiated Learning

Further support for the potential learning benefits of iPod grows out of the notion of multiple intelligences. Students have various mental models of varying strengths and preferences and these cognitive models, or "intelligences," shape the ways individuals make sense of information.¹⁹ A student's capacity for learning is influenced by the manner in which the subject matter is presented. For example, some researchers have asserted that approximately one-third of students are visual-spatial learners, one-fourth of students are auditory learners, and the other roughly 40 percent are physical (bodily-kinesthetic) learners who want hands-on experience or active physical involvement.²⁰

**Audio files offer all students
an alternative to print.**

Although these summaries are appealing in their simplicity, styles of learning are complex and likely to be shaped by a great many developmental and cultural variables. An individual student's learning style may have many layers as well as change over time. Unlike books, which tend to take a linguistic approach to learning, a video can present content through a combination of channels.²¹ These multiple entry points into the content can be especially valuable in a formal educational setting, as they offer greater accommodation to the multiple intelligences of a diverse group of students. In fact, many teachers contend that video is especially effective with special student groups including the economically disadvantaged and the learning disabled.²²

Similarly, not only do audio files appeal to aural learners, who gather information by listening, they offer all students an alternative to print, the medium that traditionally has dominated educational settings. Audio does not require a listener's full attention, so students can attend to educational content on their iPod players, for instance, while traveling to and from classes. Audio files can contribute to aural learners' listening comprehension by imposing a different cognitive load than reading comprehension; they involve real-time processing. The first two of Underwood's seven conceivable obstacles to efficient listening comprehension are "listeners can't control the speed of delivery" and "listeners can't always have words repeated"—both obstacles that iPod-supported content can overcome.²³

Time Management

Research on teacher professional development indicates that teachers want pre-selected, heavily vetted, and highly contextualized resources.²⁴ This allows them, as well as their students, to make more effective use of in- and out-of-class time. For this reason, the nimbleness of iPod as a content access system further contributes to its appeal. Content stored and delivered through iPod can provide limitless options in the timing, sequencing, and pacing of video and audio content, thus enabling increased control of instructional flow. For example, at Georgia College and State University, professors using iPod to support learning at the college level have indicated they are drawn to the tool because they preserve class time for discussion rather than requiring a review of audio material. By the school's own account, "The faculty has used iPod to maximize higher order thinking in class by using the device to time-shift less demanding work. By moving such things out of the in-class time space, faculty have used more precious in-class time to consider and think about those experiences, reflect upon them and discuss course content."²⁵

Professional Development Tool = Ever-Evolving Teaching

The very qualities that make iPod a dynamic device for student learning—transportability, rich media storage, and playback control—also contribute to its appeal as a teacher professional development (PD) tool. iPod gives practitioners the ability to review and re-use resources from formal PD sessions as well as to pursue the informal support they need to refine their classroom practice. Because the device is agile and the media it holds expandable, it allows teachers to gain more in-depth content knowledge of the subjects they teach and presents teachers with examples of real educators modeling real instructional strategies along with the pedagogical insights to take advantage of them.

Although professional development comes in many formats (face-to-face, online, self-directed, facilitated, and hybrids), iPod and content available through iTunes can be an effective component of and complement to teacher training. It is helpful to keep in mind

lessons that have surfaced in previous K-12 PD research studies that have consistently suggested professional development is more effective when it does the following:

- Fosters a deepening of subject matter knowledge, a greater understanding of learning, and a greater appreciation of students' needs
- Centers around the critical activities of teaching and learning—planning lessons, evaluating student work, developing curriculum, improving classroom practices, and increasing student learning—rather than on abstractions and generalities
- Builds on investigations of practice through cases that involve specific problems of practice, questions, analysis, reflection, and substantial professional discourse
- Is sustained, intensive, and continuously woven into the everyday fabric of the teaching profession, through modeling, coaching, and collaborations²⁶

Content Knowledge

If teachers are to keep pace with a world that is complex and constantly changing, they, like their students, must acquire the skills and tools that support their ongoing learning. This is true for the student teachers whose pre-service training is directly tied to their schools of education as well as for the most seasoned professionals who have managed their own classrooms for more than 30 years. In addition to storing audio and video podcasts for student use, teachers are discovering the combination of iPod and iTunes makes it easy to amass a library of resources that serves their shifting informational needs. For instance, they can set podcast subscriptions in their core discipline to automatic download and hold in reserve those with titles they wish to review when time allows and necessity requires.

Having a command over the content they teach is much more than a simple matter of content management for teachers, tweaking subscriptions to suit one's lifestyle and convenience. Ensuring that every classroom in America has a highly qualified teacher is one of the cornerstones of the No Child Left Behind Act. To promote meaningful learning in the classroom, teachers need to increase not just their discrete knowledge but also their depth of understanding, pushing beyond surface familiarity with basic concepts and textbook presentations.²⁷ Content on iPod, whether explicitly designed with teachers in mind as is Dr. Carlson's Science Theater or produced for a wider audience as in the case of Scientific American, can arm teachers with the background information they must possess to guide their students' explorations.

Modeling of Instructional Strategies

One of the most persistent challenges teachers face is isolation. Because a typical school day often makes it difficult to break for lunch, teachers may rarely have opportunities for sustained interaction with curriculum and media specialists, instructional leaders, and peers. iPod cannot eliminate this problem but it can alleviate it by delivering images and voices of fellow practitioners. The authenticity that teachers seek in the media assets they use with students takes on yet more value when they are identifying materials for themselves. They want to see and hear from teachers who reflect the realities of their classrooms and schools and they want the instructional strategies to be concrete.

Through podcasts housed within iTunes and featured in Apple Learning Interchange, iPod can introduce teachers to resources that resonate beyond the lifespan of a single workshop. Accessing these materials on the go and in segments, as iPod allows, is a flexible way teachers can make their way through a professional development experience. Teachers also can use voice recorders attached to iPod to record observations and reflections, returning to these voice memos and the professional development media files that gave rise to them as often as they find them useful.

Price = Affordable Teaching and Learning

Although the news media have paid a great deal of attention to such things as 99¢ songs and \$1.99 TV episodes sold through the iTunes Store, and even to the cost of iPod itself, the more compelling price reads “free.” Cultural institutions increasingly are making their holdings available to educators in digital formats, enabling iPod to promote students’ *civic literacy* by giving them opportunities to understand the materials relevant to them as citizens. The Library of Congress, for example, which already boasts of its American Memory Collection, recently announced this year’s 50 selections to be added to the National Recording Registry.²⁸ Likewise, public broadcasters are developing ways to convert their materials to classroom-friendly formats. For instance, WNET’s Wide Angle website for educators features a collection of contextualized video segments from the international documentary series that teachers and students can download. And, for their part, museums, like the Hirshorn Museum and Sculpture Garden in Washington, D.C., are podcasting guides that invite museum-goers—whether in the building or online—to interpret art and artifact.

iPod is inexpensive relative to laptop and desktop computers and carries with it the potential to use publicly available content. But, as educators are well aware, principals, superintendents and other instructional leaders regularly face budgetary decisions about what classroom resources will support student learning and teacher professional development. With iTunes and podcasting, schools and districts have a cost-effective solution for distributing content to teachers, parents, students, and others they wish to reach. Because resource management is a significant issue at all levels of education, iPod players are best acquired in the context of an overall technology plan. iPod versatility—whether it’s broadening the use of iLife and iTunes into teacher training or transporting student learning into the home—means it can extend the reach of an existing technology plan or serve as the beginnings of a new one.

To learn more about iPod in education, visit <http://www.apple.com/education>, or call 800-800-2775 to speak to an Apple education representative.

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