Chapter 12

Authentic Tasks: The Key to Harnessing the Drive to Learn in Members of “Generation Me”

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ABSTRACT

Regardless of whether one thinks of today’s higher education students as “digital natives” or members of “Generation Me,” it is obvious that traditional instructional methods are failing to engage them adequately in developing the kinds of higher order learning outcomes necessary in the 21st Century. These outcomes should encompass the conative learning domain as well as the traditional cognitive, affective, and psychomotor domains. This chapter describes a set of ten authentic tasks learning design principles that can be used to create and support the kind of engaging learning experiences that today’s learners must have if they are to achieve a full range of cognitive, affective, conative, and psychomotor outcomes for the 21st Century. A case study of a graduate level online course that exemplifies these design principles is described. Responding to the needs of Generation Me learners requires far more of a pedagogical revolution than it does the widespread adoption of Web 2.0 technologies.

INTRODUCTION

For us, the term “Digital Natives” represents an overly simplistic portrayal of the younger students enrolled in today’s colleges and universities. Prensky (2001a, b) coined the term “digital natives” to describe a new generation of students who are native speakers in the digital language of the Internet, video games, cell phones, and computers, and distinguished them from “digital immigrants” who are members of an older generation of students and their teachers who were not born into a society where digital technologies were as ubiquitous as they are now. One problem with Prensky’s definition of “digital natives” is that it seriously over-estimates the information literacy of the digital natives as opposed to their technological fluency. As Oblinger and Oblinger (2005) noted:
Having grown up with widespread access to technology, the New Gen is able to intuitively use a variety of IT devices and navigate the Internet. Although they are comfortable using technology without an instruction manual, their understanding of the technology or source quality may be shallow. (p. 2.5)

In 2009, Prensky himself admitted that the distinction between digital natives and digital immigrants was becoming less relevant. However, Prensky and others (cf. Tapscott, 2008) still appear to us to over-emphasize the technological advantages of the world in which the new generation of students have lived while underestimating the enormous changes in the social, economic, and environmental aspects of their world. In light of this, we prefer to use the term “Generation Me” (GenMe) created by Twenge (2006) to describe the majority of students born since 1990 that are in or about to enter postsecondary education in the second decade of the 21st Century. Although GenMe is usually thought of as an American construct, it can be extended to encompass young people in most developed countries in Europe as well as to Australia and New Zealand. Based upon rigorous research studies going back to the 1950s and extending into the early 2000s, Twenge (2006) presented convincing evidence that most of today’s young people, especially in the USA, have been raised to think that they will be highly successful, even stars, although the reality is that they will find it harder than ever to get into and afford the best colleges, find a high-paying, personally-rewarding job, and buy a decent home. On her Generation Me book website, she summarized the plight of GenMe as follows:

Today’s young people have been raised to aim for the stars at a time when it is more difficult than ever to get into college, find a good job, and afford a house. Their expectations are very high just as the world is becoming more competitive, so there’s a huge clash between their expectations and reality. (http://www.generationme.org/aboutbook.html)

Twenge (2006) made her observations about GenMe two years before the current global financial crisis became evident. If her predictions seemed dire then, they are even more so now. Twenge (2006) painstakingly analyzed the results of studies that involved adolescents and college students completing well-designed, validated questionnaires in the 1950s, 60s, 70s, 80s, 90s, and today. This enabled her to compare, for example, the attitudes of the Baby Boomer generation expressed when they were adolescents with the attitudes of GenMe expressed during their adolescence. This approach distinguishes her research from the majority of generational studies that have relied upon respondents such as Baby Boomers’ reporting memories of the attitudes they held in their younger years or on interviews with students selected from elite groups (cf. Howe & Strauss, 2000).

A sample of Twenge’s (2006) findings derived from data collected from 1.3 million young Americans since the 1950s include:

- In 2002, 74% of high school students admitted to cheating whereas in 1969 only 34% admitted such a failing.
- In 1967, 86% of incoming college students said that “developing a meaningful philosophy of life” was an essential life goal whereas in 2004 only 42% of GenMe freshmen agreed.
- In 2004, 48% of American college freshmen reported earning an A average in high school whereas in 1968 only 18% of freshmen reported being an A student in high school.
- In the 1950s, only 12% of young teens agreed with the statement “I am an important person” whereas by the late 1980s, 80% claimed they were important.
- In the 1960s, 42% of high school students expected to work in professional
jobs whereas in the late 1990s, 70% of high school students expected to work as a professional.

- In a recent poll, 53% of GenMe mothers agreed with the statement that a person’s main responsibility is to themselves and their children rather than making the world a better place, whereas only 28% of Boomer mothers agreed.

Regardless of whether we think of them as Digital Natives or GenMe, the challenges of preparing these new learners to have the strongest possible 21st Century skills so that they will have a better chance of successful and fulfilling lives in the face of economic, environmental, and social barriers may be greater than any time since the development of the modern university. Friedman (2008) describes the world Generation Me graduates will confront as:

*The world also has a problem: It is getting hot, flat, and crowded. That is, global warming, the stunning rise of middle classes all over the world, and rapid population growth have converged in a way that could make our planet dangerously unstable. In particular, the convergence of hot, flat, and crowded is tightening energy supplies, intensifying the extinction of plants and animals, deepening energy poverty, strengthening petrodictatorship, and accelerating climate change.* (p. 5)

We believe that Friedman (2008) accurately describes the harsh realities of the global society at least for the next decade. This raises an important question. What are the outcomes we in higher education should be addressing to prepare GenMe learners to live in this world?

**21ST CENTURY OUTCOMES**

Today, it has become commonplace to assume that members of the so-called Net Generation have sophisticated technology skills simply because they are the first generation to grow up with computers and ubiquitous Internet access (Prensky, 2008; Tapscott, 2008). Although it is clear that middle and upper class students are more likely to possess and use the latest high tech gear such as iPods, video phones, and game boxes, their information literacy, especially with respect to judging the quality of information obtained on the Internet through search engines such as Google, is unacceptably weak (Bauerline, 2008; Oblinger & Oblinger, 2005; Reeves & Oh, 2007). Information literacy encompasses far more than the ability to find information. Most importantly, it includes the capacity to judge the quality of information, to identify the underlying values inherent in diverse information resources, to communicate clear interpretations of the information found, and to use information to solve problems and accomplish tasks (Breivik, 2005).

The ability to establish a Facebook page, post a video on YouTube, or engage in Twittering says little if anything about the information literacy of today’s higher education students. The National Academies (http://www.nationalacademies.org/) issued a report that questions the presumed technological prowess of today’s younger generations (Committee on Science, Engineering, and Public Policy, 2006). The authors of this alarming report concluded that:

*It is easy to be complacent about America’s competitiveness and preeminence in science and technology. We have led the world for decades, and we continue to do so in many research fields today. But the world is changing rapidly and our advantages are no longer unique. Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position. For the first time in generations, the nation’s children could face poorer prospects than their parents and grandparents did.* (p. 8)
Salpeter (2003) describes the outcomes prescribed by the Partnership for 21st Century Skills (http://www.21stcenturyskills.org), a public-private coalition of education and business leaders founded in 2002. As illustrated in the rainbow sections of Figure 1, the outcomes prescribed by the Partnership encompass core content knowledge as well as life and career skills, learning and innovation skills, and information, media, and technology skills. (The pool sections of Figure 1 represent the support systems required by schools and universities to help students accomplish the 21st Century outcomes.) The Partnership outcomes are similar to earlier specifications of 21st Century skills delineated by others such as the “1991 SCANS Report (Secretary’s Commission on Achieving Necessary Skills) or later reports issued by the CEO Forum” (Salpeter, 2003, p. 18).

The outcomes prescribed by the Partnership for 21st Century Skills, the CEO Forum, and SCANS are improvements over earlier conceptions of the most important learning outcomes, but they still leave out an important construct, specifically, the conative domain (Reeves, 2006). Student learning outcomes in both K-12 and postsecondary education are traditionally defined in relationship to three primary domains: cognitive, affective, and psychomotor. The cognitive domain relates to the capacity to think or one’s mental skills (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Rath, and Wittrock, 2001; Bloom, Engelhart, Furst, Hill, and Krathwohl, 1956). The affective domain (Krathwohl, Bloom, & Masia, 1964) is about emotions and feelings, especially in relationship to a set of values. The psychomotor domain (Harrow, 1972) is concerned with the mastery of physical skills ranging from reflexive movements to exhibiting appropriate body language.

The neglected conative domain (Snow, Corno, & Jackson, 1996) is associated with action. It is clear that although someone may possess the cognitive capacity, affective values, and physical skills to perform a given task, whether the person possesses the will, desire, drive, level of effort, mental energy, intention, striving, and self-determination to actually perform at the highest standards possible remains an unanswered question. The conative domain focuses on conation or the act of striving to perform at the highest levels. With rare exceptions, the literature on higher education teaching, learning, and assessment is not informed by consideration of the conative domain. However, the roots of conation can be traced all the way back to Aristotle who used the Greek word “orexis” to signify striving, desire, or the conative state of mind. Kolbe (1990) contrasted...
**Authentic Tasks**

**Figure 2. Kolbe’s (1990) comparison of cognitive, affective, and conative domains**

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<thead>
<tr>
<th>Cognitive</th>
<th>Affective</th>
<th>Conative</th>
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<tr>
<td>To know</td>
<td>To feel</td>
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<td>Thinking</td>
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Given the “hot, flat, and crowded” world in which GenMe learners must live (Friedman, 2008), those of us involved in higher education must help these students develop their conative dispositions, especially their drive for learning. The purpose of this chapter is to describe an approach to developing effective learning environments that address 21st Century outcomes as well as the conative domain through the learning design principles of authentic tasks (Herrington, Reeves, & Oliver, 2006; Herrington, Reeves, Oliver, & Woo, 2004). We argue that fundamental pedagogical change must underlie any attempts to reform higher education using Web 2.0 tools. We also maintain that the widespread adoption of Web 2.0 tools without significant pedagogical change may have detrimental effects on student achievement. For example, a new study conducted by Karpinski and Duberstein (2009) at Ohio State University found that students who use the popular social networking site, Facebook, spend less time studying and have lower grades than students who don’t spend time on Facebook.

**GENERATION ME LEARNERS**

Do GenMe students learn in fundamentally different ways than the students of earlier generation? Some such as Prensky (2006) clearly believe that GenMe is fundamentally different from previous generations in ways that require new approaches to teaching and learning. Prensky (2001a) defined one side of this issue as follows:

*Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach. Today’s students have not just changed incrementally from those of the past, nor simply changed their slang, clothes, body adornments, or styles, as has happened between generations previously. A really big discontinuity has taken place. One might even call it a ‘singularity’ - an event which changes things so fundamentally that there is absolutely no going back. This so-called ‘singularity’ is the arrival and rapid dissemination of digital technology in the last decades of the 20th century.* (p. 1)

To support his contentions, Prensky (2001b) summarizes the findings of neuroscience studies from which he concludes that his so-called digital natives really do think and learn differently from the digital immigrants of earlier generations:

*Based on the latest research in neurobiology, there is no longer any question that stimulation of various kinds actually changes brain structures and affects the way people think, and that these transformations go on throughout life. The brain is, to an extent not at all understood or believed to be when Baby Boomers were growing up, massively*
plastic. It can be, and is, constantly reorganized. (Although the popular term rewired is somewhat misleading, the overall idea is right—the brain changes and organizes itself differently based on the inputs it receives.) The old idea that we have a fixed number of brain cells that die off one by one has been replaced by research showing that our supply of brain cells is replenished constantly. The brain constantly reorganizes itself all our child and adult lives, a phenomenon technically known as neuroplasticity. One of the earliest pioneers in this field of neurological research found that rats in “enriched” environments showed brain changes compared with those in “impoverished” environments after as little as two weeks. Sensory areas of their brains were thicker, other layers heavier. Changes showed consistent overall growth, leading to the conclusion that the brain maintains its plasticity for life. (p. 1)

Other scholars challenge Prensky’s optimistic interpretations of the findings of contemporary brain science done with rats (Kennedy, Judd, Churchward, Gray, & Krause, 2008; VanSlyke, 2003). Owen (2004) maintains that setting up dichotomies such as digital natives and digital immigrants can lead to poor decisions about the design of new teaching and learning environments. In support of this contention, Owen cites an influential book by John Seely Brown and Paul Duguid (2000) titled The Social Life of Information:

Brown and Duguid’s central theme is that access to information does not equate to knowledge. Brown and Duguid note, much of what we recognize as learning comes from informal social interactions between learners and mentors. These social interactions are difficult to achieve in mediated instruction. They recognize that technology can enhance instruction in remarkable ways; however, it cannot replace the insights that students receive by struggling to make sense of information with both peers and mentors. They contend that the gung-ho tunnel vision of commentators like Prensky - seeing only one way ahead (if all you have is a hammer, everything looks like a nail!), has led to erroneously simplified and unrealistic expectations of what our future in the information age will be like.

Regarding higher order learning outcomes, Healy (1998) maintains that the development of abstract reasoning ability requires the physical experience of action, the kind of experience that is decreased when children are placed in passive modes for many hours by television. She also expressed concerns about the lack of language stimulation and the accompanying decline in linguistic capabilities that stem from over-exposure to video games. Whereas Prensky (2006) argued that video games stimulate children’s creativity, Healy (1998) worried that today’s interactive media actually stifles their intellectual curiosity. A decade later, Bauerline (2008) concluded that too few of the members of GenMe “master the skills to negotiate an information-heavy, communication-based society and economy” (p. 16).

Will members of GenMe leave our universities equipped with superior information literacy that matches their purported strong technology skills as some have predicted? Or will their technology skills remain shallow and superficial? Is their information literacy limited in fundamental ways that actually reduces their powers to reflect, reason, and make decisions? The research literature in this area provides no clear answers, and so the debate continues. On the one hand, some researchers and pundits suggest that the information literacy of GenMe (digital natives) far exceeds that of earlier generations (digital immigrants), and that this has profound implications for how they should be educated. On the other hand, some argue that the media-saturated environment in which today’s youth have grown up has actually stifled some of the fundamental thinking and social interaction skills that derive from human-to-human
authentic tasks

interaction, including a decline in the capacity to reason, engage in critical reflection, and exhibit intellectual curiosity.

There is, of course, a middle ground in this debate. We support this middle ground because we believe that how people learn, reason, reflect, and create are robust human capacities that are not unduly influenced by new media and technology for better or for worse. Postman (2003) wrote:

To my knowledge, there does not exist any compelling evidence that PCs or any other manifestation of computer technology can do for children what good, well-paid, unburdened teachers can do. Nor is there any evidence whatsoever that children in wired classrooms do any better than children who aren’t. (p. 193)

**GENERATION ME AND GAME-BASED LEARNING**

Some have tried to make the case that GenMe students have been positively affected by the sophisticated interactive games and simulations they have spent much of their youth playing. Gee (2003) maintained that playing contemporary video games has positive outcomes with respect to many cognitive skills. He identified 36 important learning principles that are inherent in good video games. These include enhancing the ability to detect patterns in seemingly chaotic events and learning to think like a scientist. In a similar vein, Beck and Wade (2004) wrote:

How hard this new cohort works, how they try to compete, how they fit into teams. How they take risks – all are different in statistically verifiable ways. And those differences are driven by one central factor: growing up with video games. (p. 2)

GenMe members who play interactive games regularly appear to believe that they are learning important things through their interactive play, and not just wasting their time. For example, Beedle (2004) surveyed players of the popular online game, Everquest, and found that the majority of the players believe that playing this game increases their creativity and problem-solving abilities. Of course, there is a great leap from someone believing that playing a game increases creativity to providing demonstrative evidence that playing a game increases creativity. The latter, more desirable, research evidence does not yet exist. Other studies have detected adult-like expert behaviors among children who frequently play video games. For example, VanDenventer and White (2002) reported that observations of children teaching adults how to play video games exhibited expert behaviors such as:

...actively seeks new information; incorporates new information; assesses situations using multiple pieces of data; organizes, classifies, and categorizes information; consistently applies successful behaviors; is confident about one's own knowledge; is willing to take risks; employs corrective action when needed; can consider input from multiple sources; recognizes patterns; uses holistic thinking; is able to integrate information with behaviors; uses inductive thinking; strategizes; thinks critically; and recognizes constraints and misinformation. (p. 46)

Steinkuehler (2008) investigated the cognitive effects of playing massively multiplayer online games and found that players exhibit many skills that most universities would want their graduates to exhibit in the 21st Century:

[Massively multiplayer gaming] communities instantiate their collective intelligence (Levy, 1999) in the form of unofficial user manuals that are far more accurate than official ones, authoring and maintaining database-backed websites that function as “how to” manuals for the game (Squire & Steinkuehler, 2005; Steinkuehler, 2005e),
and they create in-game apprenticeship systems (Galarneau, 2005) that enculturate newcomers into valued cultural practices: Gamers who have already mastered the social and material practices requisite to gameplay apprentice, through scaffolded and supported interactions, newer gamers who lack such knowledge and skill. (p. 619)

Slator and Associates (2006) provide evidence of the effectiveness of multi-user role playing games in subjects as diverse as geology and microeconomics. Mitchell and Savill-Smith (2004) reviewed the literature on gaming in education and concluded that well-designed interactive games have the potential to:

- engage unmotivated learners
- engage learners who lack confidence in ability to learn
- develop skills in literacy
- develop mathematical skills
- develop skills in visualization
- develop capacity for strategic and tactical decision making
- develop critical thinking and problem solving skills

Unfortunately, whether playing interactive games has bad or good effects is the subject of much more speculation than robust research. Indeed, computer play is generally not well researched or understood. It is “the first qualitatively different form of play that has been introduced in at least several hundred years, …it merits an especially careful examination of its role in the lives of children” (Salonius-Pasternak & Gelfond, 2005, p. 6). Even when research has been done, there is substantial debate about its quality and interpretation. For example, several prominent psychologists (e.g., Anderson & Bushman, 2001; Bensley & Eenwyk, 2001; Gentile & Anderson, 2003) have presented research that indicates that some popular video games such as Doom, Grand Theft Auto and Tomb Raider encourage antisocial and even violent behavior, but other researchers have called such research into question (Cassell & Jenkins, 1998; Greenfield & Cocking, 1996; Griffiths, Davies, & Chappell, 2003; Sherry, 2001; Squire & Jenkins, 2003; Wolf & Perron, 2003). It should be clear that determining whether the members of GenMe have unique learning capacities stemming from playing online games and using other digital tools that are fundamentally different from the learning capacities of earlier generations has not been definitely established.

**THE NEED FOR PEDAGOGICAL CHANGE IN HIGHER EDUCATION**

Instead of concluding that the teaching methods of higher education need to be adjusted to accommodate the learning styles and preferences of GenMe, we prefer to argue that the pedagogy of higher education needs to be enhanced for other reasons. First, there is woefully little evidence that higher education is effective in the first place. Although virtually everyone directly involved in higher education (students, professors, parents, and alumni) seem convinced that high quality teaching and learning are occurring in our universities and colleges, the evidence for this belief is sorely lacking (Hersh & Merrow, 2005). Indeed, Schneider (2005) concludes that unquestioned belief in the efficacy of higher education is naïve:

*Americans are increasingly cynical about their public institutions and public leaders. But their skepticism does not extend to the content of a higher education. Most students—and the public as a whole—assume without question that whatever students choose to study in college, they will learn what they need to know for today’s competitive and complex environment. But in practice, college figures in the public imagination as something of a magical mystery tour. It is important to be admitted; it is also important to graduate with a*
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degree. But what one does in between, what students actually learn in college, is largely unknown and largely unchallenged. (p. 62)

In the absence of compelling evidence that higher education does yield effective learning through its primary pedagogical methods of lecturing, textbook reading, and multiple-choice testing, we conclude that pedagogical change is needed.

The National Survey of Student Engagement (NSSE) (http://nsse.iub.edu/) conducted by Indiana University indicates that undergraduate students are much less engaged in learning activities known to foster academic achievement than expected by their professors (Kuh, 2003). NSSE surveys have been conducted every year since 2000. In 2008, the survey collected data at more than 750 colleges and universities in the USA and Canada. According to NSSE, the average professor expects undergraduate students to be engaged in classes or labs 10-15 hours per week and out-of-class studying for another 25-30 hours per week. This does not seem like an unreasonable expectation, but the NSSE data shows that 20% of students spend less than 5 hours per week studying, 25% spend 6-10 hours per week, 48% spend 11-30 hours per week, and only 7% exceed the 30 hours per week expected by faculty members. Traditional pedagogical methods are not engaging the learners of any generation sufficiently, and thus fundamental pedagogical change is imperative.

The five NSSE strategies are important, but they do not spell out in sufficient detail the kind of learning design principles that professors and others who desire to develop and implement more effective learning environments in higher education require. In our research, we have previously identified the critical characteristics of the learning designs that can create and support the kind of authentic learning experiences that GenMe learners should have if they are to achieve a full range of cognitive, affective, conative, and psychomotor outcomes for the 21st Century. Ten specific learning design principles related to authentic tasks have been identified (Herrington, Reeves, Oliver, & Woo, 2004). These principles are:

1. Authentic tasks require real-world relevance: The learning tasks set for GenMe learners should match as nearly as possible the real-world tasks of professionals in practice rather than de-contextualized or academic tasks (Brown, Collins & Duguid, 1989). Authentic tasks should address the realistic economic, environmental, and social problems that GenMe must learn to solve if they are to thrive, not just survive, in the 21st Century.

2. Authentic tasks are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity: Problems inherent in the tasks set for GenMe learners should be ill-defined and open to multiple interpretations rather than easily solved by the application of existing algorithms. In the face of problems that approximate
the complexity of the real world, learners must identify their own unique tasks and sub-tasks in order to complete the major task (Cognition and Technology Group at Vanderbilt, 1990).

3. **Authentic tasks comprise complex tasks to be investigated by students over a sustained period of time:** Tasks developed for GenMe learners should require work over days, weeks, and months rather than minutes or hours. These tasks should require significant investment of time and intellectual resources (Bransford, Vye, Kinzer, & Risko, 1990). The design of authentic task-based learning environments must break out of the rigid semester and course hour structures that limit contemporary innovations in higher education.

4. **Authentic tasks provide opportunities for students to examine the task from different perspectives, using a variety of resources:** Authentic tasks should be developed in ways that afford GenMe learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than encouraging a single perspective that learners simply imitate to be successful. The use of a variety of resources rather than a limited number of preselected references requires students to distinguish relevant from irrelevant information and thus develop the high levels of information literacy as well as technological fluency they will need in the years to come (Young, 1993).

5. **Authentic tasks provide the opportunity to collaborate:** Collaboration should be integral to the tasks that GenMe learners must complete, both within the course and the real world, rather than achievable by an individual learner (Lebow & Wager, 1994). Developing the ability to lead and work in groups is essential for GenMe learners.

6. **Authentic tasks provide the opportunity to reflect:** Tasks should be designed to enable GenMe learners to make choices and reflect on their learning both individually and socially (Gordon, 1998). Self-reflection, meta-cognition, and self-regulated learning must be fostered.

7. **Authentic tasks can be integrated and applied across different subject areas and lead beyond domain-specific outcomes:** Tasks for GenMe learners should be designed to encourage disciplinary perspectives and enable students to play diverse roles thus building robust expertise rather than knowledge limited to a single well-defined field or domain (Jonassen, 1991). Traditional course and discipline structures will need to be redefined for GenMe learners.

8. **Authentic tasks are seamlessly integrated with assessment:** Assessment of how GenMe learners perform in the face of an authentic task should be seamlessly integrated with that major task in a manner that reflects real world assessment, rather than separate artificial assessment removed from the nature of the task (Herrington & Herrington, 1998). Grades that fail to represent the richness of achievements that GenMe learners must accomplish should be abolished and replaced with rich descriptions of the cognitive, affective, conative, and psychomotor progress made by these learners.

9. **Authentic tasks create polished products valuable in their own right rather than as preparation for something else:** The tasks set for GenMe learners should culminate in the creation of a whole product rather than an exercise or sub-step in preparation for something else (Barab, Squire & Dueber, 2000). Integrated with the principles of service learning (Jacoby, 1996), these products should contribute to society at large whenever possible.

10. **Authentic tasks allow competing solutions and diversity of outcome:** Authentic tasks should allow a range and diversity of
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outcomes open to multiple solutions of an original nature, rather than a single correct response obtained by the application of rules and procedures (Duchastel, 1997). Expert, peer, self, and public review of the solutions that GenMe create to the problems inherent in the authentic tasks set for them should be enabled and encouraged.

Tasks such as these are not distinguished from learning games and simulations simply by being real—indeed, they do not need to be real to be authentic. If these principles are used as a design guide, the tasks will be ‘cognitively real’ (Smith, 1987; Herrington, Reeves, & Oliver, 2007). Smith (1987) in a review of research related to simulations concluded that the ‘physical fidelity’ of the learning environment is of less importance than ‘realistic problem-solving processes’ (p. 409), a process Smith described as the ‘cognitive realism’ of the task. Scenarios and simulations can effectively be presented as realistic contexts for the investigation of complex problems in both games and in authentic tasks. However, in contrast to the more tacit learning that may occur in games, authentic tasks require realistic and polished products as outcomes. Such outputs require considerable intellectual effort in collaboration with others.

AUTHENTIC TASKS EXAMPLE

What does a learning environment based upon authentic tasks look like? The first author of this paper teaches a graduate level course online called “e-learning evaluation” in which students work in small groups to plan, conduct, and report an evaluation of an actual e-learning program for real world clients. The major task in this course approximates the real-world work of professional evaluators. The task is not a de-contextualized, academic one. The challenges of planning, conducting, and reporting an evaluation of an e-learning program in the real world are by their very nature ill-defined and open to multiple solutions rather than easily solved by the application of existing formulas. The learners in this online course must identify their own unique activities and sub-activities in order to complete the major task.

The e-learning evaluation course requires 10-15 hours per week of sustained effort over the length of a 16 week semester. The overall task requires significant investments of time and intellectual resources. This task affords learners the opportunity to approach the problem from a variety of perspectives, rather than a single set of steps that learners imitate to be successful. The use of multiple resources rather than a limited number of preselected references requires students to detect relevant from irrelevant information. Collaboration is integral to successful evaluation projects, both within the course and the real world, rather than achievable by an individual learner or evaluator. Effective group work is essential to most evaluation projects, and thus collaborative work is required in this course.

The complexities of the realistic and often unpredictable activities inherent in e-learning evaluation require learners to make choices and reflect upon and self-regulate own their learning. The activities that must be accomplished for a successful e-learning evaluation encourage interdisciplinary perspectives and enable students to play diverse roles such as project manager, data collector, statistician, and report writer. Playing these different roles allow students to develop robust expertise rather than inert knowledge. Assessment in the e-learning evaluation online course is seamlessly integrated with the major task in a manner that reflects real world assessment, rather than separate artificial assessment removed from the nature of the task. The final evaluation report is submitted to the real world client after several rounds of expert and peer assessment. The final evaluation report becomes a key part of each learner’s professional portfolio. Rubrics and models are provided to scaffold learners’ efforts
in this e-learning evaluation course, but there are multiple more or less successful outcomes.

Putting the e-learning evaluation course online has opened the course up to learners from around the world, and the course has attracted learners from Australia, Canada, Europe, and South Africa as well as the USA. Widely dispersed, the students work in virtual teams to accomplish the authentic tasks of planning, conducting, and reporting an e-learning evaluation. The evaluation clients are also widely distributed, and none of them are co-located with the learners in the course. This e-learning evaluation online course is implemented asynchronously mode using the open-access course management system Moodle (http://www.moodle.org).

Although this e-learning evaluation course is intended for graduate students, there are other examples of similar authentic task-based courses for undergraduates. For example, Herrington et al. (2006) describe:

- a humanities course about American Film and Fiction in which students edit a real journal that reports their analyses of the relevant literature and film,
- a business communication skills course in which students are “hired” at a virtual communications company where they carry out realistic tasks for a virtual employer, and
- an ecology course in which students prepare a report of the environmental impact of a new marina based on real world data.

**CONCLUSION**

There are many creative ways to design high quality authentic tasks for GenMe learners. Web 2.0 innovations such as podcasts, wikis, and social networking sites will surely have a role, but revolutionary pedagogy is required far more than new software and communication tools. Exemplary examples of higher education learning environments that incorporate many of the learning design principles outlined above can be found on our authentic tasks research project website (http://www.authentictasks.uow.edu.au/). Of course, the form and nature of the tasks will vary considerably between learning environments depending on the learning outcomes being sought.

Despite the intuitive appeal of authentic learning environments, and the considerable evidence that they are effective in promoting higher order learning (Herrington, Reeves, & Oliver, 2007), these learning environments often appear too complex to instructors who seek to design and to implement alternative approaches in their teaching. We believe that the solution to the promotion and support of authentic learning tasks can be found by enhancing their accessibility and visibility, two factors strongly influenced by the availability of appropriate representations of these learning designs. In addition, more and better research is needed. Instead of worrying about whether GenMe will learn more from virtual reality games or online communities, instructional designers and educational technology researchers should work closely with instructors and subject matter experts to identify the needs of GenMe learners, design the best possible prototype learning environments *in situ*, and then conduct iterative cycles of formative evaluation and refinement to optimize the solution and reveal ever more-refined design principles. These are the features of “design research” (Reeves, 2006).

One thing is clear. Adopting Web 2.0 technologies to serve out-dated instructional methods is sure to fail. Direct instruction of the kind advocated by Kirschner, Sweller, and Clark (2006) will not be sufficient with GenMe learners. The solution proposed by Kirschner et al. (2006) is to provide ‘information that fully explains the concepts and procedures that students are required to learn’ (p. 75). Bransford, Brown, and Cocking (2000) demonstrate clearly that superficial coverage of concepts and an over-emphasis on the teaching of facts occurs far too much in all levels of education,
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including universities. University instructors often focus more on covering content found in textbooks or embedded in classroom lectures than on learning. They primarily aim to present students with numerous facts and predictable textbook problems, and rarely attempt to engage students in the tasks involving complex, ill-structured problems of the kind encountered in the real world. This has not worked well with previous generations of students, and it surely won’t work with GenMe learners.

REFERENCES


