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The Value of Serious Play

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Consider the following two hypothetical situations:

> Two eight-year old children are building a shopping mall with Legos on a Saturday afternoon. One is working on the entrance way and the other is working on two of the mall stores. As the model gets more elaborate, they see that they will soon

run out of blocks if they wish to build the mall according to their grand design. They decide to change their strategy and build instead just the entrance way, but with doorways to the stores. They decide they can later use some old shoe boxes for the stores. They tear apart the stores already built and begin building the mall's entrance way collaboratively with renewed vigor. They even go and get some small house plants and put them in the middle as "trees." They continue working for the rest of the afternoon and into the early evening. The mother of one of the children calls to say it's time to come home for dinner. A bit aggravated by this interruption, the friend agrees to come back tomorrow to help finish the model.

A multimedia design team is busy developing the company's latest CD-ROM. The team's two graphic artists, Jean and Pat, have been trying to learn a new 3-D graphics application for use on the project. While both have been learning the tool separately on their own, they decide to work together after lunch one day. Both soon discover that the other has learned some very different things. Both decide to work on a clown figure that Jean began earlier in the week. As they try to learn all of the tricks of the package, the clown figure starts to look ridiculous and both can't help laughing at the "monster" they have created. However, they fail to figure out how to access the animation features of the software. Before they know it, it's almost 7:00 p.m. and they decide to call it a day. Later that night at home, Pat

> makes a breakthrough on the package and e-mails Jean about it, describing some key ideas they should discuss the next day. Although it’s almost midnight, Pat’s phone rings. It’s Jean. The e-mail note had just arrived and it turns out that Jean had been working on the same problem at home as well. Both laugh and look forward to seeing what the other has discovered the next day.

What do these two situations have in common? At first glance, very little. The first deals with children entertaining themselves with a favorite toy and the second with highly skilled professionals working on an expensive project for work. However, one soon sees some important similarities. Both stories show people engaged—engrossed—in an activity. All are willing to commit great amounts of time and energy. Indeed, all are unaware of the amount of time transpired, yet none would rather be doing anything else. All go to extraordinary lengths to get back to the activity. Despite the obvious intense efforts, false starts, and frustrations, all seem to be greatly enjoying themselves, as evidenced by the fact that no one is forcing them to spend free time on the activities. The children’s project isn’t intended to help them on upcoming tests at school, but it would be a mistake to think they are not learning anything. Likewise the graphic designers are not thinking about being “tested” on the graphics package and while probably not willing to share the clown graphic with their boss, they recognize that this “fun experience” is essential to learning the 3-D graphics software they need to use on the project. Both groups talk about their projects as work, yet not the kind filled with drudgery and tedium, but the kind of work leading to satisfaction and a sense of accomplishment. Of course, there is another word that describes the two groups' efforts—play.

Yes, play. We have found no better word to describe that special kind of intense learning experience in which both adults and children voluntarily devote enormous amounts of time, energy and commitment and at the same time derive great enjoyment from experience. We call this serious play to distinguish it from other interpretations which may have negative connotations. For example, while most accept the word play to describe many children's activities, adults usually bristle at the thought of using it to describe what they do. It is true that the majority of research conducted to date on play has been with children and if used or interpreted in the wrong way or wrong context it seems to cheapen or degrade a learning experience. We, too, would probably run for the door if a trainer or instructor started gushing about playing and having fun. But we argue that the same characteristics of children's play also extend well to adults[1] (see Colarusso, 1993; Kerr & Apter, 1991).

The purpose of this article is to propose serious play as a suitable goal or characteristic for those learning situations demanding creative higher-order thinking and a strong sense of personal commitment and engagement. Teachers, instructional designers, and trainers should not shy away from encouraging or expecting play behavior in their students. We go even further to suggest that those learning environments that conjure up serious play in children or adults deserve special recognition. They are doing something right, and that "something" involves a complex set of conditions.

We feel the time is ripe to seriously consider play given the current state of instructional technology. The field has struggled philosophically over the past two decades, first with the transition from a behavioral to a cognitive model of learning (Burton, Moore & Magliaro, 1996; Winn & Snyder, 1996), and more recently with reconciling the value and relevance of constructivist orientations to learning in a field dominated by instructional systems design (Duffy & Cunningham, 1996; Grabinger, 1996). At the same time, the field has witnessed remarkable advances in computer technology. The time has come to apply what we know about learning, motivation, and working cooperatively given the incredible processing power and social connectivity of computers. We feel that play is an ideal construct for linking human cognition and educational applications of technology given its rich interdisciplinary history in fields such as education, psychology, epistemology, sociology, and anthropology, and its obvious compatibility with interactive computer-based learning environments, such as microworlds, simulations, and games.

Reflection

Can you think of an experience you've had similar to Jean and Pat's (described at the beginning of the article)? What was that experience? How does your experience support (or refute) the claims of the article?

Understanding Serious Play

The serious kind of play we support is not easy to define due to its inherently personal nature. However, there is general consensus in the literature that play is a voluntary activity. However, it would be a mistake to believe that all play is voluntary. In many cultures, play activities are embedded in mandatory rituals. Even in Western cultures, when one considers the social pressures for children to join in a sporting event, such as football, or teenagers participating in a social event, such as the senior prom, one can hardly classify these as wholly voluntary acts involving active (often physical) engagement that is pleasurable for its own sake and includes a make-believe quality (Blanchard, 1995; Makedon, 1984; Pellegrini, 1995; Rieber, 1996). Other fields, such as theater arts, have long embraced play concepts.[2] For example, the theater game techniques developed by Viola Spolin not only teach a variety of performance skills but extend students' awareness of problems and ideas fundamental to intellectual growth, such as the development of imagination and intuition. Spolin (1986) maintains there are at least three levels of playing: 1) participation (fun and games); 2) problem solving (development of physical and mental perceiving tools); and 3) catalytic action (wherein opportunities arise that allow an individual to tap into the intuitive, to become spontaneous, so that breakthroughs and creativity can occur). The research literature on play, strongly rooted in anthropology, is generally organized around four themes: Play as progress, play as fantasy, play as self, and play as power (Pellegrini, 1995). Play as progress is the view that play is an activity leading to other outcomes, such as learning. Play as fantasy describes the process of “unleashing” an individual’s creative potential. Play as self acknowledges that play itself is to be valued without regard to secondary outcomes. It considers how play can enhance or extend a person’s quality of life. Play as power concerns contests in which winners and losers are declared and is very much evident in places such as the school playground, professional football stadiums, and the grass courts of Wimbledon.

The commonsense tendency to define play as the opposite of work makes it easy to be skeptical that play is a valid characterization for adult behaviors. However, Blanchard (1995) describes a simple model of human activity drawn from anthropology that shows a more accurate relationship between play and work, as illustrated in Figure 1. This model has two dimensions, pleasurability and purposefulness, with play and work being orthogonal constructs. The purposeful dimension defines a continuum with work and leisure at opposite ends. Work has a purposeful goal, whereas leisure does not. Interestingly, Blanchard contends that the English language does not have a word describing the opposite of play, so the word “not-play” is used to define opposites on the pleasurability dimension.

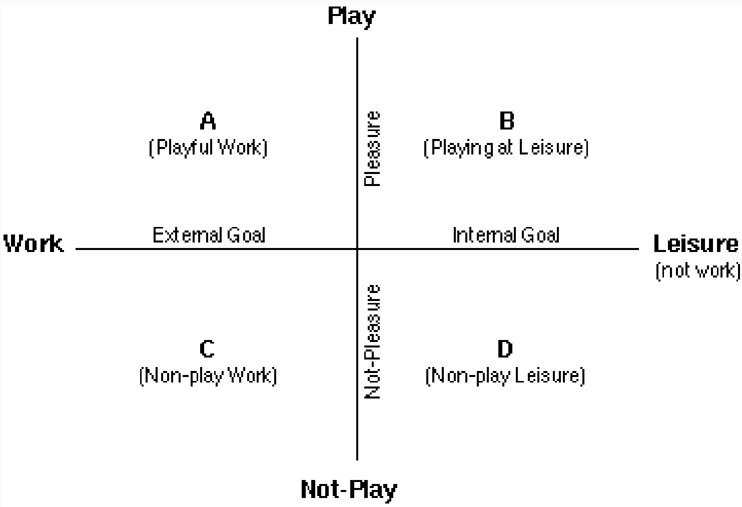

Figure 1. The Dimensions of Human Activity (taken from Blanchard, 1995, permission pending).

The four quadrants of the model encompass the full range of human activities. Quadrant A (playful work) defines the “holy grail” of occupations—getting paid to do a job that is also satisfying and rewarding. Quadrant C (not-play work), on the other hand, includes types of work that are not enjoyable, but are done due to obligations or financial necessity. Quadrant B (playing at leisure) includes those leisure activities that people devote deliberate effort to, usually over extended periods of times, such as serious hobbies or avocations. These are activities in which people grow intellectually, emotionally, or physically, such as gardening, reading, cycling, or chess. Finally, Quadrant D (not-play leisure) includes those times or activities, technically defined as “leisure,” when we find ourselves bored, unsatisfied, and with nothing to do (e.g. sitting in front of the television looking for something interesting to watch). The model applies readily to the adult world of work and leisure, but also appropriately describes school settings (for both children and adults) when you consider school to be a "job." The goals for work (Quadrants A and C) are external to the individual whereas the goals for leisure (Quadrants B and D) are internal.

A person who attains maximum pleasurability (in either Quadrant A or B) could also be described as being in a state of "flow." Flow theory, developed by Mihaly Csikszentmihalyi (1979; 1990), derives its name from the way people describe a certain state of happiness and satisfaction. They are so absorbed that they report being carried by the "flow" of the activity in an automatic and spontaneous way. Experiencing flow is an everyday occurrence, though Csikszentmihalyi is careful to point out that attaining flow demands considerable and deliberate effort and attention. Flow has many qualities and characteristics, the most notable of which are the following: optimal levels of challenge; feelings of complete control; attention focused so strongly on the activity that feelings of self-consciousness and awareness of time disappear. Think to yourself of times that you were so engrossed in an activity that you were shocked to learn that several hours had passed without your knowledge. The "work" involved at attaining flow comes from maintaining a balance between anxiety and challenge. As your experience and skill increases, you look for ways to increase the challenge, but if you try something beyond your capability you quickly become anxious. Flow can only be achieved by successfully negotiating and balancing challenge and anxiety.

Reflection

Can you think of experiences that you've had that fall into each of the four quadrants depicted in Figure 1? How often do you engage in each of them? How does your participation and behavior differ?

Play's Relevancy to Instructional Technology: Learning and Motivation

Our interest in play is derived from the longstanding goal in education of how to promote situations where a person is motivated to learn, is engaged in the learning act, is willing to go to great lengths to ensure that learning will occur, and at the same time finds the learning process (not just learning outcomes) to be satisfying and rewarding. An ambitious goal to say the least and one that seems largely unattainable. However, this is a common everyday occurrence which everyone experiences. Consider the intensity with which adults engage in complex activities during their leisure time, such as wood working, gardening, and sports. Most require the full range of intellectual learning outcomes (facts, concepts, principles, and problem-solving) and physical skill in tandem with creative expression. The intensity of children's activities during non-school time goes far beyond that of adults. For example, the stereotype of mind-numbing video games is quickly erased when you ask players to describe the rules and relationships among objects and characters in a video game (see Turkle, 1984, for an early critique of the "holding power" of video games). One discovers that the children have mastered intricately complex "virtual worlds" and could easily pass the toughest test on this "content" should one be administered (although adults rarely value this knowledge). Learning and motivation seem to reach their pinnacle in such situations.

Traditional views of motivation in education usually reduce down to two things: the motivation to initially participate in a task and subsequently choosing to persist in the task (Lepper, 1988). Motivation is also usually explained in terms of the extrinsic and intrinsic reasons for choosing to participate (Facteau, Dobbins, Russell, Ladd & Kudisch, 1995, add a third—compliance—for training environments). Extrinsic motivators are external to the person, such as attaining rewards (e.g. pay increases, praise from teachers and parents), or avoiding negative consequences (e.g. punishment, disapproval, losing one's job). In contrast, intrinsic motivators come from within the person, such as personal interest, curiosity, and satisfaction. Malone's (1981; Malone & Lepper, 1987) framework of intrinsic motivation is based on the attributes of challenge, curiosity, fantasy, and control (other notable work in this includes, of course, that of John Keller (1983; Keller & Suzuki, 1988). Challenge refers not only to the level of difficulty but also to performance feedback for the player, and includes goals, predictability of outcome, and self-esteem. Malone also warns against designing games where the curiosity factor is sensory and superficial as opposed to games in which curiosity engages deeper cognitive processes (see research by Rieber & Noah, 1997 for an example).

However, the dichotomy between extrinsic and intrinsic motivation quickly blurs in everyday situations. An employee who loves his/her job will still rely on the social and professional obligations of getting up and going to work in the morning from time to time. Students forced to study for an upcoming test may unexpectantly find themselves enjoying the material. Some extrinsic motivators are perceived as pure rewards or threats (e.g. read 10 books to earn a prize or do your homework every night to avoid a lower grade), but others may be consistent with one's goals or values (e.g. a teenager attending mandatory driver education classes or an adult choosing to enroll in graduate school). Self-determination is the degree to which one reconciles extrinsic motivators with personal choice (Deci & Ryan, 1985). A high degree of self-determination has been shown to affect the quality of one's learning (e.g. Ryan, Connell & Plant, 1990; see review by Rigby, Deci, Patrick & Ryan, 1992). In other words, the intrinsic worth of an activity is often a matter of personal choice and learning can be enhanced when one looks for and finds personal motives to not only participate but also to take responsibility for the outcome. [3]

Prescribing motivation in formal educational settings has long been a puzzle for teachers and instructional designers. Part of the problem is that too many educators consider motivation in terms of "that which gets someone else to do what we want them to." Instructional design models typically treat motivation as an "add-on" feature or concern. Frequently, designers fall prey to first designing instruction from the point of view of the subject matter and then ask "How can I make this motivating to the learner?" Instead, motivation and learning should be considered together from the start. Likewise, serious play is characterized by intense motivation coupled with goal-directed behavior.

For instructional designers, the task is to somehow blend or "wed" motivation to the learning process. Fortunately, there is research and theory that describes this "marriage" between motivation and learning, that of self-regulation (Butler & Winne, 1995; Schunk & Zimmerman, 1994; Zimmerman, 1989; Zimmerman, 1990). Individuals engaged in self-regulated learning generally possess three attributes: 1) they find the learning goals interesting for their own sake and do not need external incentives (or threats) to participate (i.e. intrinsic motivation); 2) they are able to monitor their own learning and are able to identify when they are having trouble; and 3) they consequently take the necessary steps to alter their learning environment to enable learning to take place. The most successful students self-regulate their own learning. However, many students, even if intrinsically motivated, have difficulty monitoring their own learning or employing strategies or finding resources that they need. Consequently, most students need support to varying degrees. This support takes many forms, such as access to resources and sufficient opportunity to use those resources. Students also need adequate time, a fact often neglected or difficult to manage in traditional school or training situations. However, instruction can be one of the most important kinds of support when it is provided in the context of supporting the goals and motives valued by the individual. When viewed in this way, we see no reason why play and instructional design cannot co-exist.

Reconciling play with instructional design requires a very different perspective on the relationship between curriculum, instruction, a teacher, and the individual learner. The traditional view that one group of people (instructional designers, trainers, teachers) have total authority and responsibility to create instructional activities for another group (students) must be reconsidered. A modified view grants individual learners greater authority over what they learn and how they learn it, while setting reasonable expectations consistent with an institutional framework (e.g. school, workplace) (Papert, 1993, referred to this as granting a student the “right to intellectual self-determination,” p. 5). This does not negate the need for instruction, but rather puts structured learning experiences in the context of supporting individual needs and learning goals, while at the same time recognizing that many learning goals will necessarily be external to the individual, such as skills needed in the workplace. This is in keeping with democratic ideals of education, such as those proposed by Dewey (Glickman, 1996).

Serious Play at Work for Learning

Although it is one thing to argue that serious play has value for learning and instruction, it is quite another to figure out how to put these ideas into practice. Meeting the conditions of self-regulated learning is exceedingly demanding and the inherent personal nature of serious play means that it cannot be imposed on someone. Instructional technologists keen on developing prescriptive models will find play an unsuitable and unmanageable candidate for “design principles.” But the natural, everyday tendency for play to emerge in children and adults points to a useful design tenet which also turns out to be the simplest: look for ways to trigger or coax play behavior in people and then nurture or cultivate it once it begins, just as one looks for a way to light a candle followed by both protecting and feeding the flame.

Experienced teachers are often able to invoke play and channel it toward achieving goals and objectives within the curriculum. For example, Richard McAfee is a high school social studies teacher at Central Gwinnett High School in Lawrenceville, Georgia. He uses a variety of simulation and gaming activities in his teaching. For example, he has fully integrated the simulation software package SimCity into a unit in his economics course. Here is Richard's description of the unit:

> I take the first two days to teach the SimCity software to the students because I learned early on that students have a difficult time mastering the controls and tools well enough to complete their projects in the short amount of time we have set aside for the unit. Although the students have a lot of freedom in deciding how their cities will be constructed, everyone has the goal to create a city that is physically sound and provides its citizens with necessary resources. In addition, students are required to turn in three written reports – a transportation plan, a city services plan, and a physical plan. It's remarkable how seriously students get into the process of building a city. Good ideas and strategies are both shared and guarded by students. By the end of the unit, my students literally run into the classroom to get back to their models. Of course, there are problems and not all students are equally successful in building a

> city that runs smoothly, but I find I can use all the problems and successes as a means for all students to understand the complex economic principles at work.

The intensity, seriousness, engagement, and enjoyment that Richard reports students experience as they complete their SimCity models is an apt description of the play process. Richard has found a way to let his students play with SimCity within a structure that is consistent with the curriculum objectives that he (and the school district) values. Richard's attempt at integrating SimCity into his teaching and evoking play behavior in his students while they are learning economics is in stark contrast to teachers who give students software like SimCity to play as a reward for doing their "real work." It is important to note that this has not been easy for Richard. It has required a deliberate attempt at restructuring his teaching requiring many hours of preparation. Of course, he could have spent that time preparing "to teach" in the traditional way. The result would have been "traditional" as well—the majority of students suffering through the material in order to pass the unit test. A few would do very well, a few would fail, and the rest would be glad just to get through it. In contrast, Richard's approach gives students a chance to assume "ownership" of the learning process through the act of building the model cities. The learning is richer and deeper even though his "teaching" would be difficult to evaluate using traditional models of teacher appraisal. Richard's approach broadens the definition of instruction. While there is forethought of outcomes, there is much more flexibility and opportunity to learn things that are not predetermined. The students are responsible for learning certain things, but by creating a playful atmosphere built on collaboration, the students come to value the learning outcomes that Richard has set.

This paradoxical and almost contradictory situation of play being at once too complex to fully understand and predict yet an everyday phenomena just waiting to emerge is why we have taken such an interest in microworlds, simulations, and games, especially those which are computer-based (see Rieber, 1992; 1993; 1996 for discussions and examples). The characteristics of these open-ended explorable learning environments, coupled with the processing and networking capabilities of computers, offer many opportunities for serious play. In particular, we have come to recognize the utility of games, not just for their motivational characteristics, but also for the way they provide structure and organization to complex domains. There is wonderful irony in rediscovering the technology of games—they have historical and cultural significance, but because we experience games and game-like situations continually throughout life, we tend to take them for granted.

Games are also a way of telling stories, and stories are fundamental to both understanding and learning. Part of the power of games lies in the fact that through them we have a chance to take part in cultural narratives. Playing Monopoly, for instance, is an opportunity to participate in the drama of capitalism, playing chess gives us a chance to engage in a story of conflict and resolution. Expert teachers often use stories to teach—some would argue that all learning comes through stories, because all understanding is best conceived as narrative (Schank, 1990).

The digital revolution has opened new possibilities for both gaming and education. The software market sometimes seems driven by games, usually those marketed to the power fantasies of adolescent boys; but new kinds of gaming environments are being made possible by the spread of personal computers. Consequently, new kinds of educational games have also been made possible, ones in which the motivational energy of sophisticated multimedia productions has been joined to the responsiveness of interactive learner engagement to create a gaming space that is motivating, complex, and individualized. The field of computer gaming is barely two decades old and our ability to use this medium well is just beginning to mature (some have suggested that the game Myst may be the first example of a computer game justly considered as “literature”; see Carroll, 1997).

There are two distinct applications of games in education: game playing and game designing. Game playing is the traditional approach where one provides ready made games to students. This approach has a long history and, consequently, a well-established literature. Game designing assumes that the act of building a game is itself a path to learning, regardless of whether or not the game turns out to be interesting to other people. The idea of “learning by designing” is similar to the old adage that teaching is the best way to learn something. This approach has gained increased prominence due to the proliferation of computer-based design and authoring tools.

Research has suggested that many instructional benefits may be derived from the use of educational games (Dempsey, Lucassen, Gilley & Rasmussen, 1993-1994; Randel, Morris, Wetzel & Whitehill, 1992). These benefits have been found to include improvement in practical reasoning skills, motivational levels, and retention. Reports of the effectiveness of educational games, measured as student involvement with the instructional task, have not been as consistently favorable, though a breakdown of the available studies by subject matter reveals that some knowledge domains are particularly suited to gaming, such as mathematics and language arts (Randel et al, 1992). Learning from designing games has received far less attention. This approach turns powerful authoring tools and design methodologies over to the students themselves. Consider the many projects produced in graduate-level instructional design and multimedia classes. Even if no one in the “intended audience” learns anything from the project, the designers themselves always know a great deal more about the project’s content from the act of building it. Learning by designing is a central idea in constructivism (Harel & Papert, 1990, 1992; Perkins, 1986) and game design is beginning to attract attention in the constructivist literature (Kafai, 1992, 1994a, 1994b). Likewise, our experiences with children support game design as an authentic, meaningful approach for students to situate school learning (Rieber, Luke & Smith, 1998).

Instructional designers also need to give serious attention to the differential exposure of boys and girls in gaming environments (Lever, 1976). Although choices of play activities change for both boys and girls as they grow older, gender play preference differences are found at all age levels (Almqvist, 1989; Beato, 1997; Clarke, 1995; Krantz, 1997; Paley, 1984; Provenzo, 1981). Until recently, however, few video games were designed with female play preferences in mind. A survey by U.S. News and World Report (1996) indicated more than 6 million U.S. households included females between 8 and 18 with access to multimedia computers, yet there were relatively few computer games that were even marketed to girls. As a result, girls were not playing these games in great numbers. Thus, with greater hands-on experience, many boys regarded aspects of computers with greater confidence and familiarity than girls (Wajcman, 1991). However, after years of disregard, it now appears the industry is beginning to experience a change of heart. Some experts expect 200 new games, based on research that emphasizes girl's play preferences, to reach store shelves by the fall of 1997 (Beato, 1997). This is a tenfold increase from 1996. For example, the company Purple Moon is specifically targeting the market of adolescent girls with help from video game pioneer Brenda Laurel. Companies are finally recognizing that girls have different interests and agendas. The stereotype that girls want "easy games" is also finally disappearing. As Krantz (1997, p. 49) notes, "Girls don't think boys' games are hard; they think they're too stupid." If girls are to have the same technological chances as boys, then teachers and parents need to seek the inclusion of computer "play" materials in the curriculum that motivates females as well as males.

Closing

Play is an essential part of the learning process throughout life and should not be neglected. We feel that instructional design will benefit from recognizing this fact. Play that is serious and focused within a learning environment can help learners construct a more personalized and reflective understanding. As educators, our challenge is to implicate motivation into learning through play, and to recognize that play has an important cognitive role in learning. As instructional technologists, we have the opportunity to use the expanding power of computers to provide new venues for play in learning—as simulations, microworlds, and especially games.

Computer games offer a new possibility for wedding motivation and self-regulated learning within a constructivist framework, one which strives to combine both training and education, practice and reflection, into a seamless learning experience. Computers are making possible a new chapter to be written in the long history of games in education. The issue of gender and learning is of particular importance to instructional technologists, since technology is often seen as a male prerogative. Instructors and educational game designers are beginning to have a better understanding of how gender differences affect learning, and how to implement that understanding in better instructional design.

Research on computer programming by Sherry Turkle and Seymour Papert illustrate our perspective on the value of play in instructional technology. Turkle and Papert’s research (1991) contrasts two different programming styles that they describe as “hard” and “soft” mastery. Hard mastery is compared to the clarity and control of the engineer or scientist, while soft mastery is more like the give and take of a negotiator or artist. They equate soft mastery to that of a bricoleur, or tinkerer. Elements are continually and playfully rearranged to arrive at new combinations, often resulting in unexpected results. Just as Turkle and Papert advocate that the computer culture looks beyond a single method of programming, we advocate a variety of approaches to instructional design and learning. The value of play should not be overlooked.

Application Exercise

- When was the last time you had serious play? What was it like? What allowed it to become serious play?
- Describe a time you found yourself in "flow." What were you doing and how did you achieve flow?
- Randomly select one element from each of these lists: [Agriculture, Chemistry, Computer programming, Design skills, Math] [Toddlers, Sixth graders, Families, Young adults, the elderly] Using the principles from this chapter, design a game to teach _______ to _______.

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1. An interesting example of the value of play in the creative

process at the corporate level can be found at Avelino Associates, a San Francisco-based organizational development and systems integration firm. Their intent is to create a collaboration between technological and artistic professionals. Multi-talented performing artists are hired by Avelino for creative and organizational skills that are highly transferable between the technological and artistic modes (DeDanan, 1997). ↵

2. In 1963, Viola Spolin in conjunction with Paul Sills founded the Second City Improvisational Theater and as such laid the foundation for all improvisational companies since. ↵
3. There is considerable debate in the motivational literature over whether the intrinsic value of an activity can be undermined by the promise of external rewards, a phenomena often referred to as "turning play into work"—an unfortunate wording, in our opinion, because it promotes the misconception that play is the opposite of work. (See Cameron & Pierce, 1994; Cameron & Pierce, 1996; Greene & Lepper, 1974; Lepper, Greene & Nisbett, 1973; Lepper & Chabay, 1985; Lepper, Keavney & Drake, 1996 for examples of the research and arguments surrounding this debate.) ↵

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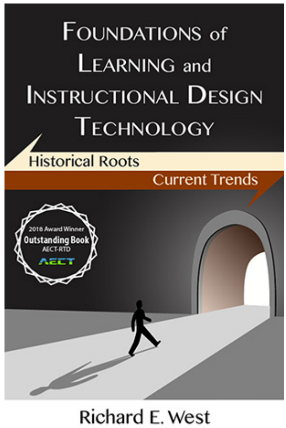

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