CHAPTER 34a
Being a Lion and Being a Soldier
Learning and Games

JAMES PAUL GEE
and TASHIA MORGRIDGE
UNIVERSITY OF WISCONSIN-MADISON

Learning in Popular Culture

In this chapter, we want to discuss the larger issue of the contribution modern video game technologies can make to learning by focusing on one paper: Facer et al.'s (2004) paper, "Savannah: Mobile Gaming and Learning?" (hereafter, "SMGL"). This paper is one of a number of recent educational studies that seek to draw on the power of modern popular culture to enhance school-based learning (McFarlane, Sparrowhawk, & Heald, 2002). In fact, SMGL (Facer et al., 2004) attempts to combine two popular technologies: wireless mobile devices and video games. Since both are used for powerful purposes outside school, SMGL argues that "the school setting should at least begin to engage with these tools" (p. 399).

Before we discuss SMGL (Facer et al., 2004) directly, we want to discuss the wider context in which the paper has appeared and the context in which it should be read. Then, we will turn to a direct discussion of the paper. Finally, we will place SMGL in the context of commercial video games that seek to teach "content," as does the project SMGL describes, though quite different content is involved in the two cases. Ultimately, what we are talking about is how modern "digital literacies" (in this case, video games) can deepen learning both inside and outside school as we know it, especially our current skill-and-drill sorting system. This project has a critical edge; however, we know too little as of yet to go right to critical politics in this area. We need to get a feeling

Q1

for this new landscape before we can fully sort out the political responses we should have to our new media and their uses and abuses. Therefore, we leave deep critical responses—for example, claims that video games reflect cultural prejudices (e.g., *Grand Theft Auto: San Andreas Fault)* or commercial culture (e.g., *The Sims*)—aside for the time being.

Over the last few years, interest in the contrast between popular culture and school has risen (Gee, 2003, 2004; Johnson, 2006 ; Lankshear, 1997; Q2 Lankshear & Knobel, 2003; Prensky, 2006; Shaffer, Squire, Halverson, & Gee, 2005). Today, young people sometimes seem to engage in deeper learning in their popular culture than they do in school, especially schools devoted to skill-and-drill in the service of passing standardized tests.

SMGL (Facer et al., 2004) wants to draw on the power of gaming to recruit school-based learning, so we consider, for a moment, video games like *Rise of Nations*, *Age of Mythology*, *Deus Ex*, *The Elder Scrolls III: Morrowind*, and *Tony Hawk's Underground*. Modern commercial video games are long, complex, and difficult. If they could not be learned, they would not be played, and in fact, it has been argued that such games recruit learning as a form of pleasure (Gee, 2005). We survey a few of the learning features that good video games incorporate as a way to teach and to create active engagement (Games-to-Teach Team, 2003; Gee, 2003, 2004). The reader should contrast these features, as we discuss them, with how learning often works in schools today. It is learning features like these that the authors of SMGL wanted to recruit, and we can reflect, as well, on how well they did this when we more directly discuss SMGL (Facer et al., 2004). The following are some learning features that good video games often incorporate into their design.

Good video games offer players strong identities. Learning a new domain, whether physics or furniture making, requires learning to see and value work and the world in new ways, for example, the ways in which physicists or furniture makers do. In video games, players learn to view the virtual world through the eyes and values of a distinctive identity (e.g., Solid Snake in *Metal Gear Solid*) or one they themselves have built from the ground up (e.g., in *The Elder Scrolls III: Morrowind*).

Good video games make players think like scientists. Game play is built on a cycle typical of experimental science: "hypothesize, probe the world, get a Q3 reaction, reflect on the results, re-probe to get better results."

Good video games let players be producers, not just consumers. An open-ended game like *The Elder Scrolls III: Morrowind* is, in the end, a different game for each player. Players codesign the game through their unique actions and decisions. At another level, many games come with software through which players can modify ("mod") them, producing new scenarios or whole new games (e.g., new skate parks in the *Tony Hawk* games).

Good games lower the consequences of failure. When players fail, they can start from their last saved game. Players are encouraged to take risks, explore, and try new things.

Good games allow players to customize the game to fit their learning and playing styles. Games often have different difficulty levels and many allow problems to be solved in multiple ways.

Thanks to all the preceding features, players feel a real sense of agency, ownership, and control; it is *their* game.

Learning, however, goes even deeper in good games. Research has shown that when learners are left free in problem spaces, they often hit on creative solutions to complex problems, but solutions that do not lead to good hypotheses for later, even easier problems (Gee, 2003). In good video games, problems are well ordered so that earlier ones lead to hypotheses that work well for later, harder problems.

Good games offer players a set of challenging problems and let them practice these problems until they have routinized their mastery. Then, the game throws a new class of problems at the players (this is sometimes called a "boss"), requiring them to rethink their taken-for-granted mastery. In turn, this new mastery is consolidated through repetition (with variation), only to be challenged again. This cycle of consolidation and challenge is the basis of the development of expertise in any domain (Bereiter & Scardamalia, 1993).

Good games stay within, but at the outer edge of, the player's "regime of competence" (diSessa, 2000, p. XX); that is, they feel "doable," but challenging. This makes them pleasantly frustrating—a flow state for human beings (Csikszentmihalyi, 1990). Q4

Games encourage players to think about relationships—not isolated events—facts, and skills. In a game like *Rise of Nations*, players need to think about how each action they take might impact their future actions and the actions of the opposing players as they move their civilizations through the ages.

Games encourage a distinctive view of intelligence. Many baby boomers think that being smart is moving as fast and as efficiently as possible toward their goals. Games encourage players to thoroughly explore before moving on, to think laterally (not just linearly), and to use such exploration and lateral thinking to reconceive their goals from time to time. They encourage good ideas in a world full of high-risk, complex systems.

Games recruit smart tools. The virtual characters that players manipulate in games are "smart tools." They have skills and knowledge of their own, which they lend to the player. For example, the citizens in *Rise of Nations* know how to build cities, but the player needs to know where to build them. This means that the knowledge to play the game is distributed between the player and smart tools that themselves store knowledge.

Games often recruit cross-functional teams in which each person has a distinctive expertise (function) but can integrate well with the skills (functions) of the other team members (making the team cross-functional), just like modern, high-tech workplaces. In a multiplayer game like *World of Warcraft*, players play on teams in which each player has a different set of skills (functions). Each player must master a specialty, since a Mage plays differently than a

Warrior, but understand enough of each other's specializations to coordinate with them. Furthermore, on such teams, people are affiliated by their commitment to a common endeavor, not primarily by their race, class, ethnicity, or gender (Gee, 2004). The latter are available as resources for the whole group if or when players wish to use them. Thus, the core knowledge needed to play video games is distributed among a set of real people and, as we mentioned earlier, their smart tools, just as knowledge is distributed in a modern science lab or high-tech workplace.

Video games operate by a principle of performance before competence. Players can perform before they are competent because of the design of the game, the "smart tools" the game offers, and often, other, more advanced players (either in the game or in chat rooms) support them.

People are poor at dealing with lots of words out of context. Games usually give verbal information "just in time"—when players need and can use it—or "on demand" when players ask for it. Furthermore, research suggests that people really know what words mean only when they can hook them to the sorts of experiences to which they refer, that is, to the sorts of actions, images, or dialogues to which the words relate (Gee, 2004). This gives the words situated meanings, not just verbal ones. Games always situate ("show") the meanings of words and show how they vary across different actions, images, and dialogues. They do not just offer words for words ("definitions").

At this point, the reader should stop and ask himself or herself whether the features of video games we have just surveyed would or would not be good learning features to have in a school curriculum, even if no game were involved. We think most readers will say "yes" to this question. In fact, these learning features, which players see in good video games, are all well supported by research in the learning sciences (Gee, 2003, 2004, 2005). All of them could present in school, for example in learning science (diSessa, 2000), even if no game were present; however, today, they are often better represented in popular culture than in school. When we evaluate projects like SMGL (Facer et al., 2004), we can use these features—and others like them—as a checklist to see how "game-like" (versus traditional "school-like") the learning the project recruited was.

"Savannah: Mobile Gaming and Learning?"

Now, we turn to SMGL (Facer et al., 2004) and consider how it did or did not use these sorts of learning features connected to good games. SMGL reports on a project that explored the learning that occurred in a setting where 11- to 12-year-old children from Bristol, England, used mobile technologies in a game-like set of activities. These activities involved both moving around in real space (a field) and acting on the basis of virtual images seen and sounds heard via the mobile device.

The specific goal of the project was to develop children's conceptual understanding of animal behavior and interaction with the environment. The children played at "being a pride of lions" (Facer et al., 2004, p. 400) outside in a playing field. They had global positioning systems (GPSs) linked to personal digital assistants (PDAs) that allowed them to "see," "hear," and "smell" the world of the Savannah (via their PDAs with headphones) as they navigated the real playing field space outdoors (having to ignore, we suppose, the real sights and sounds of the field). The virtual Savannah map on the PDA was comprised of a number of zones including long grass, short grass, gully, kopje, spring, and trees. These areas were populated by various sorts of wildlife. Each zone was correlated with (and triggered by) a part of the real field through which the children moved. The children also had an energy bar that let them know their specific energy levels at any time.

In addition, the children engaged with an indoor space, called the "Den," where they worked with teachers to reflect on how well they had succeeded in the game, access other resources to support their understanding, and develop strategies for surviving as lions in the virtual Savannah. The "Den" operated less like a game and more like a classroom.

In this game, the children were required to act as a pride of lions. Their main challenge was to understand and survive in the Savannah. They had to balance the costs and benefits of different types of activity—whether attacking, drinking, sleeping, or running—in order to maintain their energy levels. They also had to negotiate with each other in order to decide whether or how to collaborate in achieving objectives.

The researchers reported that analyses of their data provided evidence to suggest that the students felt that they were actually experiencing the Savannah, that they were identifying with their new roles as lions, and that they found it highly engaging (Facer et al., 2004). The students often talked in the game as if they were directly experiencing the simulation. During play, they said things such as "I'm nearly dead," "We're hot," and "We're attacking" (p. 403).

The researchers remarked that an interesting aspect of the game is its physical nature, which they believed contributes to the "directness of the experience" (Facer et al., 2004, p. 403). They pointed out that when the children were, for example, running away from the elephant, they were actually running and not moving an avatar in a desktop computer game. This, they suggested, "supports children's learning" (p. 403), though it is not clear, to us at least, how.

While observation of game play suggested identification and immersion in the experience, the researchers nonetheless reported that the children, due to their experience with much more sophisticated commercial games and other media, expected a much richer and more interactive environment (Facer et al., 2004). A bigger problem, however, was the disjuncture between the reality of

the game world and the reality of an actual Savannah. This was a problematic feature not only for the children in the study, but also for the researchers themselves.

One example of this disjuncture was the notion of different time scales in a real Savannah as compared to the virtual Savannah. In the virtual Savannah, played out on a playing field with no physical obstacles, for example, it is possible for children to traverse the area within five minutes. In a real Savannah, the same space would take lions several hours and would offer numerous physical challenges. The authors pointed out, then, that "[t]he challenge of creating a 'real' experience of lions' day-to-day lives in a virtual environment mapped onto empty physical space remains on-going in terms of the prototype development" (Facer et al, 2004, pp. 404–405). Despite these caveats, the researchers claimed,

> Identification with roles in games-play is not wholly reliant on "realism," but on the perceived reality of the challenges within the game world. Children's identification with roles in the games illustrates the degree to which the children are directly experiencing the game in a way that can be qualitatively different from desktop gaming. However, the breakdowns in identification discussed above show that children's experience with the game was not always as direct as it could have been. (p. 405)

Q5

One of the most interesting findings of the research was the numerous identities that the children had to juggle in the game's experience. This finding

> would lead us to look beyond simple "identification with the role" as a feature of the learning experience. The children were required to act as "lions acting as lions," as "children acting as lions" and as "children reflecting on their actions and the rules of the game" in order to play better. (Facer et al., 2004, p. 405)

During the Savannah experience, the children said things like "I'm too hot" (speaking as lion), but they also said things like "Hey, look a lion cub—I'm going to kill it! Look I got points for that" (child as lion) when observing their energy points. In addition, they said things like "Next time we won't do that!" (child as reflective game player) upon on their death after deciding to attack the Masai (Facer et al., 2004, p. 405).

The researchers hoped that the interplay of these different identities would lead to an interplay, as well, between immersion and reflection and between the specifics of a particular challenge and an understanding of the rules of the game (Facer et al., 2004). The researchers' intention was to design a game in which the rules that governed the game directly reflected the rules that shape lion behavior in the wild. This means that children could come to understand lion behavior (the academic goal) by understanding—through action and interaction—the rules of the video/mobile game. In certain instances, the researchers did see evidence that this was occurring:

> For example, a key feature of lion behaviour is quantification of risk—lions encountering lions from another pride will "count" the numbers of their opponents before deciding whether to fight; they will calculate whether they have sufficient numbers to take on prey of different sizes. These features were all built into the game rules, with energy points awarded or deducted for children making the correct calculations. This sort of behaviour was encouraged by the game and in evidence in the children's play after their initial attempts. (pp. 405–406)

In addition, the children gradually became aware that working in groups, rather than in isolation, was likely to lead to greater success, and this encouraged collaborative activities among the children. At the same time, however, the children were also coming to learn certain rules about the game's environment that conflicted with the generalized understanding of the Savannah that the researchers had intended (Facer et al., 2004). For example, while the children did develop an understanding of how lions actually use the territorial space of the Savannah, due to the game design, they were being reinforced to think that lions spend equal amounts of time in all areas of the Savannah. This was due, it seems, to a lack of accurate understanding about the structure of lion behavior over a typical day. Too much emphasis was placed on repeatedly killing prey (as the children found this to be the most rewarding aspect of the game), and the prey could be found all over the Savannah. Thus, the children were motivated to repeatedly search around the Savannah, indiscriminately killing prey.

The researchers admitted that one of the least successful aspects of the project was the attempt to combine a more formal "school" experience with game play (Facer et al., 2004). Reflecting on the fact that, in popular culture, young people develop strategic and critical thinking in relation to video games as part of a gaming community, a community in which the dominant approach to learning is just-in-time learning, trial and error, and participation in activities with more knowledgeable peers, the researchers commented,

> From our observations, the greatest failure of the study to date was the failure to maximise the opportunity for the children to act as self-motivated learners in the Den setting, reflecting on and developing strategies for improved games play. Instead, perhaps out of our own concern about the limitations of the game structure, we offered children the opportunity to act as players outside, and then in the Den requested that they act "as pupils" and listen to useful information. This failed to encourage children either to look for, or to use, the more complex theoretical information on lion behaviour that was available to them for use in the game. (p. 407)

In the end, the researchers said that it has become clear to them that the use of a games approach to learning is "unlikely to sit easily alongside traditional classroom power relations" (Facer et al., 2004, p. 407). Gamers in popular

culture control their own learning with the help of more knowledgeable peers. If approaches like the one taken in SMGL are too successful, the researchers concluded that

> we may need to build in the expectation that children as gamers are more likely to learn effectively by subsequently acting as mentors to novice learners (see Gee, 2003; Williamson, 2003). This will require some degree of courage, and, to be honest, some reorganisation of the school setting. (p. 407)

Games and Learning

The Savannah project in SMGL (Facer et al., 2004) is a good project—both in terms of what worked and what did not—with which to think. To what extent does it draw on the power of video games—features of which we discussed in the first section—to create motivation and deep problem solving? The key to this issue lies in something directly stated in SMGL: The researchers' intention was to design a game in which the rules that governed the game directly reflected the rules that shape lion behavior in the wild. That is, what you do in the game—in terms of actions and goals—should directly correlate with and reflect what lions do in the wild. This match is the heart and soul of building a learning game. Where it was done well, the Savannah project worked well, and where it was not done well, the Savannah project did not work as well.

A video game is a rule system. Players seek to discover how these rules work in order to solve problems and accomplish goals. To do so, they control pieces of the in-game world (an avatar or a number of them). In SMGL (Facer et al., 2004), the children controlled their real bodies by moving around a real field, while watching images of lions and other things on a screen.

Many commercial games do not have "content" in the sense that algebra or chemistry has content (e.g., a body of facts, principles, and regularities that fall within a specific well-defined domain of knowledge). In this sense of "content," *Mario* has not got content. The Savannah project was, of course, intended to have content in the academic sense, though we will see soon that its actual content is not entirely clear.

Some commercial video games—oddly enough—do have content in the sense of a well-defined domain of knowledge. For example, the game *Full Spectrum Warrior* is about the knowledge needed to be a professional soldier, and *S.W.A.T.4* is about the knowledge needed to be a professional S.W.A.T. team member. Of course, being a soldier or a police officer is not like being a chemist or an historian, but they are all domains in which people act on the basis of special knowledge. It is around such domains that school and schooling are defined. Indeed, as we will see, what video games suggest to us learning theorists is that we should view things like being a chemist or an historian

as roles people play, goals they have, and activities they do, rather than as a long list of facts outside any context of goals and action.

Oddly enough, it is not really clear what the content of the Savannah project in SMGL (Facer et al., 2004) is. It appears at first blush to be "acting and thinking like a lion." On reflection, however, it appears to be "acting and thinking like a human ecologist who studies lions." In reality, the game (outside in the field) is devoted mostly (but not entirely) to the first goal, and the nongame, school-like environment inside in the Den is devoted to the second goal. Two different rule sets occur here: a game-like one in role-playing a lion and a school-like one in learning about lion ecology. The children were not, however, encouraged to reflect on the differences between these roles—between the expertise of a lion and the expertise of a human ecologist and the relationships (and contrasts) between them. Q6

To get a deeper view of how game rules and content can be married, we can look at one of the commercial games that consummates that marriage well: *Full Spectrum Warrior* (Gee, 2005). Such games reflect all the learning features we started with in the first section, so it is instructive to compare and contrast them with something like the Savannah project.

Full Spectrum Warrior teaches the player (yes, it is a teacher) how to be a professional soldier. It demands that the player thinks, values, and acts like one to win the game. In *Full Spectrum Warrior*, the player uses the buttons on the controller to give orders to the soldiers, as well as to consult a GPS device, radio for support, and communicate with command. The Instruction Manual that comes with the game makes it clear from the outset that players must think, act, and value like a professional soldier to play the game successfully: "Everything about your squad … is the result of careful planning and years of experience on the battlefield. Respect that experience, soldier, since it's what will keep your soldiers alive." (p. 2) Q7

By the way, thinking and acting like a soldier is not the same thing as thinking and acting like a military historian or professional military strategist directing a whole war (actually, a quite different category of game devoted to the latter exists). Furthermore, simply reflecting on being and performing as a soldier will not, in and of itself, lead to the insights of the historian or the strategist (though they are relevant, of course). In addition, being and performing as a lion—even reflecting on being and performing as a lion—will not, in and of itself, lead to the insights of an ecologist. They are two different (though partially related) "games."

Beyond values, another important aspect of *Full Spectrum Warrior* is the fact that the virtual characters in the game (the soldiers in the squads) and the real-world player control different parts of the domain of military knowledge. We get the whole domain only when we put their knowledge together. The knowledge is *distributed* between them. A human (the player) shares knowledge with a virtual reality (the soldiers).

Full Spectrum Warrior is designed in such a way that certain knowledge and skills are built right into the virtual characters, both the soldiers and the enemies. Other knowledge must be learned and used by the player:

> The soldiers on your teams have been trained in movement formations, so your role is to select the best position for them on the field. They will automatically move to the formation selected and take up their scanning sectors, each man covering an arc of view. (p. 15)

Q8

Thus, the virtual characters (the soldiers) have some knowledge (the various movement formations), and you, the player, have other knowledge (when and where to engage in such formations). This is true of every aspect of military knowledge in the game. Your soldiers know different things than you know and have mastered different bits of professional military practice than the bits you need to master to play the game. The game only works when the two different bits are put together—thought about and acted on—as a whole by the player who uses the virtual soldiers as smart tools or resources.

The player is immersed in activity, values, and ways of seeing. The player, however, is scaffolded by the knowledge built into the virtual characters and the weapons, equipment, and environments in the game. The player is also scaffolded by some quite explicit instruction given "just in time," when it can be understood in action and through experiences that make clear what the words really mean in context. The learner is not left to his or her own devices to rediscover the foundations of a professional practice that took hundreds of years to develop.

This distribution of knowledge allows for the operation of an important learning principle: "performance before competence" (Gee, 2005). When players start the game, they have very little competence at being soldiers, but thanks to the fact that the virtual soldiers know a good deal, they can act right away and make at least some headway. They can start by performing, gain competence, and then, if they want, read those texts and actually understand them, thanks to the fact that they now have some images and experiences with which to comprehend them. In school, when students have little competence, they are expected to sit around and read a great deal of text before they get to do anything.

Q9

Many will object to *Full Spectrum Warrior* because of its ideology (values and worldview). What this type of game exemplifies, however, is that there is no real learning without some ideology. Adopting a certain set of values and a particular worldview is intimately connected to doing the activities and having the experiences that constitute any specific domain of knowledge. Physicists hold certain values and adopt a specific worldview because their knowledge making is based on seeing and valuing the world in certain ways. The values and worldview of astrologists comport badly with those of an astronomer; the values and world view of a creationist comport badly with those of an evolutionary biologist.

As one masters *Full Spectrum Warrior,* through scaffolded activity based on distributed knowledge, facts—many of them—come free. All sorts of arcane words and information that would be hard to retain through rote drill become part of one's arsenal (tools) through which activity is accomplished and experience is understood. For example, one player now knows what "bounding" means in military practice, how it is connected to military values, and its tactical role in achieving military goals. If another player knows only what it means in terms of a verbal definition, her or his understanding could not begin to compete with the first player.

All games involve content. They build a virtual world of a certain sort, but only some of them involve content in the same way school does—in terms of well-defined domains of knowledge. Players playing any game must reflectively become aware of how the game's content (world) is designed to facilitate or retard goals, choices, strategies, and actions. If that that content were, however, a branch of science—for example, a certain type of biology—the player would have to consider the content of biology not as a set of passive facts, but as a domain of facts, information, values, and practices that enhance or retard certain goals, choices, strategies, and actions, namely those of a certain type of scientist. This, then, would be science not as inert content, but as a "way of life," as a way of being in the world that leads to certain sorts of values, goals, and actions rooted in a body of facts, information, and practices. That is, of course, what *Full Spectrum Warrior* does for soldiering and *S.W.A.T. 4* does for being a S.W.A.T. team member. It is too bad we have no *Full Spectrum Chemist*, *Historian*, or *Biologist* (though we do have a *Full Spectrum Urban Planner,* Will Wright's *SimCity*).

The theory of learning in many of our schools today is based on what we call the "content fetish" (Gee, 2004). The content fetish is the view that any academic area, whether it is physics, sociology, or history, is composed of a set of facts or a body of information, and the way learning should work is through teaching and testing such facts and information. Indeed, this is a view of schooling and knowledge that the Savannah project (Facer et al., 2004) is meant to combat, though, perhaps it did not combat it far enough, especially in the Den. *Know*, however, is a verb before it is a noun, as in *knowledge*. Any domain of knowledge, academic or not, is first and foremost a set of activities (special ways of acting and interacting to produce and use knowledge) and experiences (special ways of seeing, valuing, and being in the world). Physicists *do* physics, they *talk* physics, and when they are being physicists, they *see* and *value* the world in a different way than do nonphysicists. The same goes for good anthropologists, linguists, urban planners, army officers, doctors, artists, literary critics, historians, and so forth (diSessa, 2000; Lave, 1996; Ochs, Gonzales, & Jacoby, 1996; Shaffer, 2004).

Q10

Q11

The Savannah project (Facer et al., 2004) seeks, in some sense, to be a *Full Spectrum Lion*, but at times confounds and confuses this with trying to be a *Full Spectrum Lion Ecologist* (though this part is mostly played out in the Den

outside of a gaming framework). Gaming was all right for playing a lion, but not for playing an ecologist, even though both are rule-governed (patterned) ways of being in the world and thus, open to being games. If we make them games, however, we need to be clear on which game we are playing (lion or ecologist, because each game has different rules and patterns), why we are playing it, and what the relationship is between the two games.

The Savannah project, despite using wireless connections and handheld devices, does not have the sophisticated distribution of knowledge between computer characters and environments and real-world players of *Full Spectrum Warrior*. The virtual lions are not "smart" in the way that *Full Spectrum Warrior* soldiers are, and they do not scaffold the player's learning and growing skills like those soldiers do. Scaffolding is left, by and large, to teachers and texts outside the game. The match between the game rules (what players do to accomplish goals and win the game) and the knowledge and values of being a soldier is closer in *Full Spectrum Warrior* than it is between the game rules in the Savannah project and the knowledge and values of being either a lion or a lion ecologist.

In the end, SMGL (Facer et al., 2004) leaned too far toward school and not far enough toward solid gaming, and ironically, did not facilitate as deep a learning as it might have. In a good game, everything to be learned is tied tightly to the rules of the game and to the goals the player is trying to achieve by working within and understanding the full power of those rules. If the game has content in the academic sense, then the game rules need to be closely married to the content, so that in understanding one, the player understands the other. This is what *Full Spectrum Warrior* and *S.W.A.T.4* do so well. They achieve this over and above the learning features we discussed in the first section.

In the Savannah project (Facer et al., 2004), however, some elements float free of the game rules and goals. For example, running across a real field plays no integral role in the rules or goals of the lion game, and at times, contradicts those rules (e.g., five minutes across a field with no obstacles is not equal to hours of effort across a tough terrain). Going to the Den (the ecologist "game" played by school rules) is not well integrated with the rules and goals of the lion game. Indeed, even in the lion game, it would seem that confusion or confounding exists between thinking like a lion and thinking like a human ecologist. For example, lions do not meditate on their energy levels by looking at data. Rather, they get weaker, it gets harder to do things, and they have to deal with it or die—so, this is how it has to work in a game.

Nonetheless, the Savannah project (Facer et al., 2004) was on to something important. A great power exists in the tri-part play of identities between "being a lion," "being a lion ecologist," and "being 'Susie,'" (an actual child with all her real world identities, desires, and interests). In the project, there is real potential for powerful interactions. If all three had consistently been

"gamed" and their relationships and contrasts had been guided and reflected upon, things may have gotten even better. This would have been more like playing *Full Spectrum Warrior* (getting into the shoes of a soldier on the ground) than playing *Combat Mission 2: Barbarossa to Berlin* (getting into the shoes of a military strategist who looks at the big picture, mediates on the relationships between the two, and reflects, as well, on his or her own real-world identities, values, and desires and how they relate to being a solider and a strategist). We could go further: playing war journalist, politician, and peace activist, comparing and contrasting all the way. Q12

SMGL (Facer et al., 2004) is a good paper because it is honest and insightful about what worked and what did not. It is good design research—a type of research based on cycles of design, assess, critique, and try again—in that respect. What we have wanted to stress here is that this design research process could be aided by a deeper mediation on games and gaming. We are prepared to take schooling and school content seriously, but we are just learning to take games seriously.

One thing that SMGL (Facer et al., 2004) surely gets right is that game-like learning is not only about the game in the box, but also about a whole learning and social system built around the game. Wiring the learners together so they can collaborate and form a social system is a wonderful learning feature. SMGL is a good start at building a learning system around a game. In that respect, the authors are more in the position of the Army using *Full Spectrum Warrior* to train real troops than they are in the position of gamers playing a game for their own edification. Surely, we live in a world where we need to become as adept as—hopefully even better than—the Army at getting people to learn, especially to learn knowledge domains beyond fighting. In order to do that, we would have to make good games of our own.

In this chapter, we are trying to suggest a strategy for people who want to design games for content-based school-like learning—games like the Savannah project. The first part of the strategy is to reflect on the learning features incorporated into good commercial games, even if they do not involve academic content. The second part of the strategy is to reflect on good commercial games like *Full Spectrum Warrior* or *S.W.A.T. 4* or simulation games like *Zoo Tycoon*, *SimCity*, *Civilization*, or *Roller Coaster Tycoon* that do "teach" content, even if their content is politically "incorrect" or unappealing in some respects (as many people will find soldiering). This is another thing that we—educators—have to learn from popular culture.

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COMMENTS

Q1 CA: Please check to make sure that the meaning of this sentence has remained intact.

Q2 CA: Please supply full reference for "Johnson, 2006" or delete this citation from the text.

Q3 CA: Please supply full citation for this quotation.

Q4 CA: Please provide page numbers for this quotation.

Q5 CA: This word was followed by an end quotation mark, but since there was no beginning quotation mark, it was deleted. Please verify that this is correct.

Q6 CA: Please provide page numbers for these quotations. If this is not quoted material, please delete the quotation marks.

Q7 CA: Please provide full citation and reference for this quote. See APA 4.16, p. 251, on creating a brochure reference.

Q8 CA: Please provide full citation and reference for this quotation.

Q9 CA: Please provide the page number for this quotation.

Q10 CA: Please provide a page number for this quotation.

Q11 CA: Earlier, you referred to this project as SMGL.

Q12 CA: It seems that a word might be missing. Not sure what the "two" things are that you are comparing here—being a soldier and being a military strategist? Please clarify.

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