Computer-based life simulations and young adolescents: Identity exploration, information learning, and sense-making

Kallen Tsikalas
ktsikalas@gmail.com

Descriptors
- Adolescence
- Learning Processes/Strategies
- Video games

Abstract
This descriptive study examined patterns of play and learning within a computer-based life simulation game for 13 low-income, urban adolescents. Behavior log and structured interview data from 63 different simulated lives were used to characterize participants' identity explorations, information learning, sense-making, beliefs and values. Findings suggest that students engaged in three types of identity exploration when playing the game – projective play, identified play and experimentation. Additionally, they were able to abstract personally-meaningful decision-making strategies about relationships, education, jobs, and money management. This research indicates that life simulation games can play a valuable role in supporting healthy adolescent development, and it outlines possible applications for teachers and counselors.

Objectives

Borrowing from two bodies of research on learning and development, this study seeks to develop a framework for examining adolescents' learning within computer-based life simulations. It characterizes types of learning that students experience when they engage in self-directed play with Real Lives™ --including identity explorations, information acquisition, self-reflection and sense-making activities. It also documents beliefs and values manifested in play.

Theoretical Framework

Computer-based simulations are models of reality that players interact with. They are valuable for assessing the consequences of decisions that might be too risky to undertake in real life and for identifying divergent decision paths. Life simulations, in particular, present models of human development and inter-personal relationships. Two bodies of research help us build a framework to identify and describe learning that may occur from playing these types of games.

Turkle's (1995) and Bers's (2001) research on identity laboratories suggests that individuals may use role-playing environments, like computer-based life simulations, to experiment with possible selves and decision-paths. Research by Dempsey, Lucassen, Haynes, and Casey (1997), Ge and Land (2003), and Squire and Barab (2004) confirms that learning within such environments is highly dependent on individuals' preferences, goals and competencies. Given that adolescence is a time of identity-searching (Erikson, 1968), youth may benefit enormously from playing simulated lives.

Research on social learning theories also offers guidance for building a framework about learning in life simulations. Through observation (including observation of simulated characters), learners can acquire information, cognitive competencies, behavior patterns, standards, and strategies (Bandura, 1986; Zimmerman, 2002). Moreover, observing characters' mistakes helps students identify bad decisions and correct errors (Schunk and Hanson, 1987).

To learn from observation, however, students must first pay attention to important information in the character's performance. One of the most effective ways to channel learners' attention is to have them set goals and monitor progress towards these goals (Zimmerman and Kitsantas, 2002). Learners must then cognitively transform this information into forms they can retain, apply and adapt. Sense-making involves integrating prior knowledge and linking ideas. It is enhanced by self-explanation (Davis, 2003; Chi, deLeeuw, Chiu, and LaVancher, 1994), scaffolded social interactions (Lin, 2001), and environmental regulators such as scoring systems that reward or penalize reflective behavior (Rieber and Noah, 1997; Van Eck and Dempsey, 2002).

Methods

This descriptive study examines both qualitative data (structured interviews) and quantitative data (behavior logs) from 63 different simulated lives.

Participants

Participants were 13 sixth-graders, aged 11 and 12 years, who attended two public middle schools in New York City. Seven of the participants were girls (54%), and all self-identified as either Latino or Caribbean-American. Nearly a third (31%) read above grade level at the time of the study, and 54% read below grade-level. Reading level was reported by the students' Language Arts teachers.

Procedures

After obtaining parental consent, participants at each school were placed in small groups. Each group met for multiple, 45-minute "play" sessions in a classroom at their school. During these sessions, students worked on their own computer and played Real Lives™ for approximately 25 minutes. Collaboration was allowed. For the last 15 minutes, students responded individually to structured interview questions. All students participated in a post-interview.

Materials and measures

Computer-based life simulation. The 2004 version of Real Lives™ was used in the study. This probabilistic simulation provides students with textual representations of life paths. Participants are "born" as a character with a family, life circumstances, and personal attributes. They make decisions about education, jobs, marriage, and expenditures. They also respond to events and ethical dilemmas, based on statistically accurate information from the CIA World Factbook, Worldbook Online and other sources.

Behavior log. Real Lives™ records players' behaviors and decisions in each simulated life.

Structured interview. Administered at the end of each session, the structured interview consisted of seven questions about goals, decisions, and lessons learned. Participants tape recorded their answers. Transcripts were analyzed thematically.

Post-interview. The post-interview was conducted one week after the final session and included ten questions. It asked participants about details of their simulated lives, surprises they encountered, and various types of lessons they learned. Interviews were recorded, transcribed and analyzed thematically.

Results

Decision-making

Students strongly avoided behaviors like smoking and teen pregnancy in their simulated lives. In contrast, higher education was highly valued: 92% of the students attempted to go to college or vocational school in the majority of their simulated lives. Interestingly, eight students (62%) chose to commit crimes in at least one of their simulated lives; five committed multiple crimes. Four students repeatedly had more than five children, and their reasons for doing so were

uniquely strategic: One said his wife would be less likely to leave if they had many children. Another thought his simulated children would be less lonely if they had many siblings.

Identity exploration

Participants designed their own characters in at least two play sessions. Three patterns of identity play emerged from their actions in the game and choices regarding character creation.

- Projective play occurred when students designed and lived the lives of characters that represented a life they, themselves, would like to live – a future self. For example, one student created characters in France because she hoped to become a fashion designer and live in France.
- Identified play occurred when adolescents designed and lived the lives of characters that were similar to family members or friends. Often they named characters after themselves or friends and sometimes tried to recreate specific life paths. For example, one student tried to replicate the choices of her mother, who became pregnant as a teen and then emigrated to build a successful life.
- Experimental play occurred when participants explored many character types and decision options, including negative ones, just to see what happened.

Information learning

By playing Real Lives™, participants acquired new information in a variety of domains. Related to academics, one child said that he learned "facts" particularly about wars. Another abstracted that rules-for-living vary by country. She noted that living in the US was different from other countries because "it seems that we have different rules… we have more freedom than them." She commented that there were more gender prejudices and educational limitations in other countries. Participants also seemed to rapidly appropriate new terminology, such as "income", "expenses," and "investments," from simulated lives.

Regarding life information, one male remarked, "I already knew that kids could be in school, but I didn't know there was such a thing as graduate school or vocational school." Two students were dismayed to learn that their parents could die.

Self-reflection and sense-making

Bad decisions. To reflect upon the quality of their choices, participants were asked to identify bad decisions. Twelve year-olds were more likely than younger participants to name bad decisions they made during the game. Some students were also able to predict possible consequences of these decisions:

- I think I made the wrong decision when I stole. This affected me because if I'd got arrested, they probably would've fired me from my job as college president because they wouldn't want no convict as a college president. And it'd be hard to find a good job because I'd have a record now… So, I won't steal anything and that's it (DP, male).
- The key decision I made was a big mistake was that I caused my people, my family, to starve by spending little money (RA, female).
- I learned that making decisions will affect you in the real world, and makin' a bad decision can make you regret things (TD, male).

Strategies. When identifying strategies they had learned in playing Real Lives™, students actively thought about and abstracted lessons about relationships, jobs, and money management. Examples of their reflections are:

- I learned that first you have to settle down, get a job and if you have a relationship with somebody and there's been times when you weren't doing good in school and, if you have a boyfriend, you weren't doing good in school, so you probably say that you have to back off a little bit. Spend some time away so I could get my grades back up (AC, female).
- [Before choosing your boyfriend], you have to see if he's intelligent, his wisdom is high, and his happiness is also high. If you have a low happiness, that means that you are very, very mad or sad or don't want to be with nobody. And wisdom is like justice, right? [So, if he is wise, he'll be] a fair person (MT, female).
- I learned that when you go to college, you can get better jobs, you can get paid more. The more you ask for a raise, you get a raise and you can turn $472 into $2,720 a year (DF, male).
- I actually learned from that that it was better to work… to go to school, because if you go to school, you got a good job. And when you got a good job, you get enough money to give out to other people (IC, female).
- I don't remember what country I was in, but I couldn't find a job. And I said, 'Oh should I be a shoe cleaner because that's the only thing left.' And I was like, 'No, I don't want to be a shoe cleaner. I want people to clean *my* shoes.' Because, I don't know, I don't feel like working for people. But if I didn't pick anything, then I would probably have to go to welfare. So, even if you don't like them, you have to get enough money to lay back and relax. If you're not settled yet, then you can't say, 'Oh I don't want that' (AC, female).
- I learned about how to keep my financial side good because something went wrong, so I had to add up and see what happened if I lived a luxurious and what would happen if I lived a simple life: If I lived a luxurious life, it would cost me too much, so I had to live a simple life (TD, male).
- [I learned to] never have that much children, like five or seven, because if you don't have that much money to buy them food or something, you can't have that much (DM, male).

Beliefs and values

Valued character attributes. When selecting their characters' initial attributes (e.g., starting levels of happiness, intelligence, appearance, etc.), students overwhelmingly chose intelligence as the attribute they would set highest. One student summarized: "I put my intelligence all the way to 100 so I could skip years in school, so I could be intelligent and go to college, go to vocational school, go to graduate school, have a successful life, and become an NGO supervisor—that's the best paying job in the game."

Goals. When playing Real Lives™, participants typically indicated that their goals were to get a good job, have a family and live a good life. For two sessions, when students chose goals from a list, they most commonly selected "learning different ways to deal with bad situations" (50%); "learning not to give up even when things are hard" (43%); and "learning different ways to make money" (29%).

Educational Importance

This research suggests that computer-based life simulation games, such as Real Lives™, can play a valuable role in supporting healthy adolescent development. Educators might use these tools to deliver factual information in an engaging format and to help students develop self-regulatory skills such as goal-setting, monitoring and self-reflection. They might also use these tools to initiate explicit class discussions about the problems with entity theories of intelligence.

Therapeutically, the games may be useful in diagnosing and addressing potentially maladaptive patterns of behavior. To the extent that children's choices and goals in simulated lives reflect their true realities, therapists can use these environments as tools in play or narrative therapy. Counselors might also intervene with students who repeatedly make bad decisions, like committing crimes. Finally, therapists can use these games to help young people identify and see the consequences of their life choices.

References

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bers, M.U. (2001). Identity construction environments: Developing personal and moral values through the design of a virtual city. *The Journal of the Learning Sciences*, 10 (4), 365-415.

Chi, MTH, deLeeuw, N., Chiu, MH, and LaVancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science*, 18, 439-477.

Davis, E.A. (2003). Prompting middle school science students for productive reflection: Generic and directed prompts. *The Journal of the Learning Sciences*, 12 (1), 91-142.

Dempsey, J., Lucassen, B., Haynes, L.L., and Casey, M.S. (1997). An Exploratory study of 40 computer games: COE Technical Report N. 97-2. University of South Alabama.

Erikson, Erik H. *Identity Youth and Crisis*. W. W. Norton & Company, 1968.

Ge, X. and Land, S.M. (2003). Scaffolding students' problem-solving processes in an ill-structured task using question prompts and peer interactions. *Educational Technology Research and Development, 51* (1), 21-38.

Gee, J.P. (2003). *What video games have to teach us about literacy and learning.* New York: Palgrave.

Lin, X. (2001). Designing metacognitive activities. *Educational Technology Research and Development, 49* (2), 23-40.

Rieber, L.P. and Noah, D (1997). *Effect of gaming and visual metaphors on reflective cognition within computer-based simulations.* Paper presented at the Annual Meeting of the American Educational Research Association. Chicago, IL; April, 1997.

Schunk, D.H., and Hanson, A.R. (1987). Peer-model attributes and children's achievement behaviors. *Journal of Educational Psychology, 79* (1), 54-61.

Squire, K., and Barab, S. (2004). *Replaying history: Engaging urban underserved students in learning world history through computer simulation games.* Paper presented at the International Conference of the Learning Sciences. Santa Monica, CA: June, 2004.

Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet.* New York: Simon & Schuster.

Van Eck, R. and Dempsey, J. (2002). The effect of competition and contextualized advisement on the transfer of mathematics skills in a computer-based instructional simulation game. *Educational Technology Research and Development, 50* (3), 23-41.

Zimmerman, B.J. (2002). Achieving self-regulation: The trial and triumph of adolescence. In F. Pajares & T. Urdan (Eds), *Academic motivation of adolescents* (vol. 2, pp. 1-27). Greenwich, CT: Information Age.

Zimmerman, B. J. and Kitsantas, A. (2002). Acquiring writing revision and self-regulatory skill through observation and emulation. *Journal of Educational Psychology, 94* (4), 660-668.