21st Century Literacies at Play: Recreational Digital Games for 21st Century Learners
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Introduction
• Gee (2009) argues that play in good games can help develop "embodied empathy for complex systems, grit (persistence + passion) + playfulness + engagement + design thinking; collaborations in which groups are smarter than the smartest person in the group; and real understanding that leads to problem solving and not just test passing" (p. 4).
• Success in good digital games depends, in part, on engaging critical thinking, problem-solving, creativity, communication, and collaboration skills.
• The skills required for success in these activities parallel many of the competencies associated with the Framework for 21st Century Learning developed by the Partnership for 21st Century Skills (2011).

21st Century Literacies
The Framework of 21st Century Learning (Partnership for 21st Century Skills, 2011) encompasses the skills below in addition to Core Subjects and 21st Century Themes that are not discussed here.
• Life & Career Skills – ability to adapt to changes, self-motivate and take initiative, work effectively in diverse social environments, be responsible and accountable, understand leadership roles, and respect others
• Learning & Innovation Skills – ability to problem solve, think both creatively and critically, and clearly communicate ideas to and collaborate with others
• Information, Media, Technology Skills – the ability to effectively and ethically use information, media, and technology to research, organize, evaluate, create, manage, and communicate information.

Literature Review
• Galanrewu & Zibit (2011) argue that online games create informal and organic environments in which play supports incidental learning of 21st Century skills.
• Martin & Steinkeuhler (2010) designed a framework for collective information literacy from observations of Massively Multiplayer Online Game Players (MMOG) socially finding, verifying, using, and sharing information
• Neuman (2011) describes how games are information rich environments that include interactive information objects in a variety of formats. This interactivity requires that the learner takes an active role during their encounter.
• Gee (2008) argues that simulations allow learners to prepare for experiences in ways that facilitate achieving their goals; the price of failure in games is very low, and this encourages exploration and allows learners to gain experience by taking risks.
• Hobbs and Rowe (2011) believe that the online games have tremendous potential for teaching media literacy skills. The mix of learning and play create an environment where learners can engage in the creation and analysis of messages. Skills may be transferred to the real-world by participating in an online community. Wasko (2008) describes how media literacy skills are critical, especially as advertisements are becoming more embedded in games.
• Learners develop a sense of cognitive self-efficacy in formal and informal environments; Moline (2010) believes that school librarians can capitalize on the inquiry strategies and skills learners are developing in informal learning environments and use those abilities to develop learners’ information literacy skills. Libraries have been adding games to their collections to encourage learners’ development of critical thinking and inquiry skills, their use of information sources, and to facilitate participation in knowledge-based collaboration (Neuman, 2011).

Visit the interactive version of this poster by scanning the QR code.

Twine (Klimas, 2012)
• Free tool that allows users to create simple linear or complex, multi-layered hypertext multimedia stories and games.
• Skills engaged: creativity, initiative, planning, design thinking, technology literacy, media literacy, communication, storytelling

RPG Maker (Enterbrain, 2007-2013)
• RPG Maker is not a game per se, so much as it is an engine through which complex role playing games can be made.
• Game creation engages design thinking, creativity, technology literacy, and may involve collaboration. These games can have intricate plots that require problem solving and critical thinking skills.

Implications
• Recreational games have educational value and may have a place in the classrooms of the 21st Century learners.
• A better understanding of how good games help learners develop 21st Century Skills will give insight and lead to improvements in literacy instruction, online and face to face education, usability and information architecture, game design and development.

Future Work
• Research about effective integration of 21st Century literacies in game environments
• Ethnographic work on the social information cultures of MMOG players to understand how digital literacies are developed and utilized within virtual worlds

Minecraft (Mojang, 2009)
• In this sandbox of cube blocks, players can create practically any structure they can imagine
• Skills engaged: critical thinking, problem solving, time management, planning, creativity, collaboration, communication, leadership, design thinking, technology literacy
• See Minecraftedu.com and Minecraftinschool.pbworks.com for information on getting Minecraft into the classroom.

Portal 1 & 2 (Valve Corporation, 2007; 2011)
• Use portals to solve puzzles to escape a testing facility
• Skills engaged: critical thinking, problem solving, communication, leadership, planning, creativity, collaboration, design thinking, technology literacy
• TeachWithPortals.com, available through Steam for Schools, lets teachers and students access Portal 2 to build their own 3D and maps.

Cogs (Lazy 8 Studios, 2008-2011)
• At first glance, Cogs is a simple sliding-tile game where players must connect gears or tubes. However, the difficulty quickly escalates as the playing field goes from 2 dimensions to 3. For example, players must simultaneously sync gears and connect tubes on multiple sides of a cube or plane in order to solve the puzzle.
• Skills engaged: critical thinking, problem solving, and spatial reasoning skills.

Universe Sandbox (Dixon, Herold, Steinröhder, Grønneløv & Hilton, 2012)
• In this simulation, players can tap into the forces that control the universe, to create and destroy planets, solar systems, and galaxies. Players can complete objectives, or simply experiment with psychics.
• Skills engaged: critical thinking, problem solving, communication, leadership, planning, creativity, collaboration, design thinking, technology literacy

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