

## **Secondary Worlds and computer gaming in Education**

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# SECONDARY WORLDS AND COMPUTER GAMING IN EDUCATION

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## Abstract

*Fantasy worlds have long enthralled and engaged learner imaginations with Tolkien defining those of sufficient detail as Secondary Worlds, distinct from the Primary World of our everyday experience. Within such worlds learners can imaginatively explore beyond the narratives provided and by combining such worlds with the interactivity of games, particularly computer games, extending this ability to explore persistent Secondary Worlds that learners can influence and change, share experiences with others, and contribute to the mythologies of these worlds. This rich exploration provides opportunities to learn by enhancing the mental models constructed by our explorations of Secondary Worlds and transferring this learning to the mental models held of similar concepts in the Primary World. Two examples are briefly described to clarify the concepts presented, firstly the use of a Year 8 Social Studies simulation of the world of StatecraftX in which empire building, resource management, and refugee dilemmas provided a context for student engagement with a Secondary World and transfer concepts developed in world to those under study; and secondly, the use of the Secondary world of the Simpsons, particularly the Springfield Primary School, as a familiar Secondary World setting in which to explore teacher education situations and transfer learning to real world practice.*

## Secondary Worlds

There lies a space between the world of the mundane, of muggles, the ordinary, and of fantasy, of Middle Earth, Star Wars, Hogwarts, of Faërie. It is in this space that the magic of each can intermingle and interact in the minds of learners. Our world is full of technological marvels, grand social and political dramas, and epic tales writ large in movie theatres and TV screens, such that learners may seem poor actors with few opportunities to contribute to the play.

Learners are however imbued with the power of creation, to shape worlds apart from their own in which to explore and participate, through their minds, in all aspects of life that they may deny themselves or are denied to them. Where they lack the inclination or capacity to create such worlds themselves, writers and producers craft for them worlds to explore. Tolkien first described the literary subcreation of Secondary Worlds (Tolkien, 1938), as created, consistent, fictional worlds or settings, more recently also called conworlds or fictional universes, in contrast to reality, the Primary World.

Not every fiction however provides sufficient depth to sustain fanciful explorations. What distinguishes a Secondary World from a simple setting is the level of detail, complexity and consistency that makes this world believable. Not as a replacement for the Primary World, but as a plausible possibility with sufficient internal strength that such a world could exist, if only in our minds (Tolkien, 1938). The detail and complexity of Secondary Worlds must be sufficient to facilitate learners' mental exploration. When constrained to a single location, set of characters, or isolated event, learners may reinterpret such settings in their minds but they lack the depth required to sustain their exploration of the world itself, going beyond constructed narratives to create their own stories within this world. However for this to be a Secondary World, we must believe that these stories could exist in the Secondary World. Belief is not required that monsters, magic or aliens exist in the Primary World, but that in the subcreation, the Secondary World, they can exist, and are consistent with the laws and nature of this World. It is when this belief breaks down and fails, where we disbelieve in the essential nature of the Secondary World, that a "suspension of disbelief" (Coleridge, 1817) is necessary to remain engaged in the fantasy of the Secondary World, but at a poor substitute for true belief (Tolkien, 1956, 60-61).

Since Tolkien's exposition on Secondary Worlds in 1938, they now commonly transcend (Klastrup & Tosca, 2004) literary works (List of fictional universes in literature, n.d.) to include a range and combination of media. TV series, movies (List of fictional universes in film and television, n.d.), comics (List of fictional universes in animation and comics, n.d.) and games (List of fictional universes in games, n.d), all contribute to a wide range of literary Secondary Worlds. While initially criticism existed of their contribution to the imaginative mental exploration of Secondary Worlds because of their explicit visualisations (Tolkien, 1966, 80), some Secondary Worlds now emerge first in other media. The Star Wars, Batman, and Stargate universe's are as rich as any literary world, and various game based Secondary Worlds greatly exceed the complexity of literary, film or TV subcreations.

## **Games**

Drawing richly upon Tolkien's world of Arda, the Secondary Worlds of the Dungeons and Dragons Role Playing Game (RPG), known as campaign worlds, began with the world of Greyhawk and now encompass a dozen distinct worlds. Likewise the Traveller RPG defines an entire galaxy of worlds, their histories, inhabitants and technologies. Board Games such as Star Fleet Battles, Trading Card Games such as Pokemon, and War Games such as Warhammer, each have complex Secondary Worlds with derivative literary works, movies and TV series. Computer games, while initially replicating other game formats, now create their own Secondary Worlds, such as World of Warcraft, Halo, and Final Fantasy, each of which has with their own literary and film spin offs.

Games in their various formats however can bring something new to Secondary Worlds (Wolf, 2002). Something that literature, TV and film based works cannot contribute. Interaction. Game Play. The ability for the player to engage with and shape the Secondary World, not just in their imagination, but of the media that describes the Secondary World itself. It is as if the player can contribute and rewrite paragraphs and chapters of literary texts, or modify and make additional scenes to film and TV series.

Not all games permit this, most follow a traditional literary trajectory in which players are bound by the authors vision of the world and the narrative they are permitted to experience. Gameplay in such games cannot shape this narrative beyond having to redo events until the correct activity to progress the narrative is achieved, victory is always certain with sufficient tenacity, and exploration constrained to that necessary for the predetermined narrative to unfold. The settings created in these cases often fall short of becoming Secondary Worlds, just as can occur with other media. Games in which learners can imagine themselves beyond the narratives woven by authors, exploring that which is detailed but not described in specific narratives, can create Secondary Worlds of great depth and complexity. Computer game based Secondary Worlds have the added advantage of allowing immediate contributions by players, interactively shaping the world in which they are playing, and in this reshaping, make changes persistent, existing when a player next enters the world, and for multiplayer games, changes that affect other players in a shared Secondary World.

## **Popularity of Computer Games**

Despite the criticism of many computer games to build effective Secondary Worlds, they are undoubtedly phenomenally popular. One reason is that they provide a temporary escape from the constraints of the Primary World. Players can go, be and do things they cannot in the Primary World and are content to suspend their disbelief to the inconsistencies and shallowness of these worlds to do so. Unlike imagination, game players do not need to build their own interpretation of the Secondary World in order to conduct flights of fantasy, game developers have provided this step, albeit at a low level. Yet despite these failings, players can still escape for a short while into these worlds and interact with them even when they would not otherwise be of sufficient depth to engage them imaginatively in the manner a fully developed Secondary World would enable.

Tolkien (1997) described two forms of such escapism. The deserter who wants to escape his duties, and the prisoner escaping to freedom. Tolkien criticises the first as unjustified and includes the proponents of scepticism, romanticism and postmodernism with their cynical denunciation of reality, as escaping to private fantasy worlds without responsibilities, and leaving the problems of the Primary World to others (Konzack, 2006). Such criticism can be similarly levelled at computer games that focus on gameplay, of introspection on a narrow personal world without consideration of the underlying forces and morality at play that shape the deeper and more complex aspects of such worlds.

The second is presented as justified and a critique of modernist views on escapism as an illegal act. Tolkien argues that there is nothing wrong with fantasising, delving into a secondary world of imagination, neither socially nor psychologically. “Fantasy is a natural human activity. It certainly does not destroy or even insult reason; and it does not either blunt the appetite for, nor obscure the perception of, scientific verity. On the contrary. The keener and the clearer is the reason, the better fantasy will it make“ (Tolkien, 1997).

When players participate in this creative process, the negotiation and co-construction of a Secondary World can highlight the power relationships that so concern postmodernists. Gamers however need not retreat into their own personally constructed worlds, but in facing the challenge of understanding and overcoming difficulties in collective subcreation and of the interplay of players within these worlds, better understand such forces in the Primary World.

Games that reach the level of complexity of a Secondary World provide their players with a rich means of exploring complex moral, philosophical and religious issues. They challenge players at the level of historic myth, of epic heroes facing complex moral dilemmas, of the corrupting influence of power, and Machiavellian strategies to obtain and retain such power. Computer games at this level do not reject such power plays, they democratise them, with opportunities for anyone to participate.

Unlike other media however, gamers do not need to await further works to expand the corpus of such Secondary Worlds. They can take their imaginative contributions and place them into the game environment, adding to the subcreation themselves. In this means the Secondary World transcends being the product of a single author or publisher, it becomes a community activity. Some gamers find fulfilment in making imaginative contributions, subcreating additions to the world, others enjoy exploration of the world for its own sake, or overcoming the immediate challenges and problem solving in the game world, and some will undertake to better understand the nature of power within the rules and philosophies of the fictional universe.

Games can empower us to explore the philosophic nature of complex Secondary Worlds and influence this nature with contributions to the epic narratives of these worlds. In doing so, Secondary Worlds provide a lens upon which to view and understand the Primary World, or in simpler terms, to learn.

## **Education through Secondary Worlds**

Exploration of Secondary Worlds, at various levels, has the potential to help us better understand the Primary World. It is this aspect that makes computer games particularly applicable to education.

Learning about and within a Secondary World provides a necessarily simplified and abstracted application of skills and knowledge that can be potentially transferred to the Primary World. These can range from ‘soft skills’ such as perseverance, resilience, etc. through problem solving, teamwork, creative thinking, etc. to ‘hard skills’ in studies of Geography, English, Mathematics, Physics, etc. The important facet is that within the Secondary World, knowledge and skill development can be achieved and transferred to contexts in the Primary World.

A problem exists however, the engagement that players have with games is what often drives their personal learning of game world concepts, students wishing to better succeed in a game will seek to

learn concepts in the Primary World to take into the Secondary for application in a game. Teachers however often look at games in terms of what concepts students can learn in a games Secondary World to apply this learning to the Primary World. What is oft lacking is an understanding of the processes and mechanisms, from both student and teacher perspectives, to efficiently and reliably transfer learning between these Worlds.

## **Mental Models**

In our journey so far we have seen that Secondary Worlds can exist in our minds as macroscopic constructs, integrating many different concepts and processes to form coherent and consistent worlds. Craik (1943) however proposed approaching this in another way, the idea that small scale constructs, mental models, can build to give us an explanation of the world, allowing us to reason and anticipate events. In this way we can see Secondary Worlds as being the sum of many parts, many concepts, and many opportunities to learn through experiencing these part in clearer ways than in the Primary World because they are necessarily simplified and codified with explicit rules, particularly when simulated as a computer game.

Exploration of such Secondary Worlds provides us with many opportunities to compare and contrast our experiences with those in the Primary World. It is when these experiences differ that we have cognitive dissonance, our experiences of the Primary World do not sync with our experiences in the Secondary. Even when such differences are part of the fantasy nature of the Secondary World, we still have opportunities for learning. In attempting to reconcile Secondary and Primary world concepts, ideas, beliefs, and values, we are driven to minimise and resolve such conflicts (Festinger, 1957). This process of modifying our mental models forms the basis of cognitive conflict pedagogy (Stavy & Berkovitz, 1980).

We can also learn through the use of Secondary Worlds without necessarily relying upon conflicts between concepts held in each world. Transferring learning from one context to another (Thorndike & Woodworth, 1901) has long been the subject of educational research and when applied to the transfer of learning between worlds, primary to secondary or secondary to primary, there exists opportunities to support learning. Ideally there should be no need to transfer learning, with all learning in Secondary or Primary Worlds contributing to the same mental model developed by the learner for a particular concept. It is only when different mental models are constructed for the same concept that transfer is required, or in terms of neuroscience, that the two models are either integrated by making sufficient connections between the two networks in the brain to make them one, or one model is neglected to the point that it is no longer used when applying the concept. Computer games can be used to facilitate these processes at multiple levels of mental model development.

## **StatecraftX**

The application of Secondary Worlds to transfer learning from computer games to concepts in the Primary World can be illuminated briefly through two examples. The first was within a case study of the Serious Play ARC funded research project in which 26 year 8 students studying social studies in a metropolitan Queensland high school played the iPod computer game StatecraftX over a three week period. Students primarily played the game outside of school time with class time used to link gameplay with the curriculum. In this game students undertook leadership roles of a small kingdom that faced various economic, social, cultural and military challenges. Students collaboratively engaged with the Secondary World of Velar in the kingdom of Bellalonia, its king had passed away, leaving the young Prince Judio as the sole heir. In order to prevent chaos in the kingdom, the Grand Sage of Bellalonia had proposed that the governors (student players) of the kingdom undergo various challenges and help Prince Judio rule the kingdom until he comes of age. Combined with a detailed geographical map, complex economic system, and comprehensive history, a fictional setting was provided with sufficient depth to generate a Secondary World. Within this world player interactions and collaborations developed a continuing narrative with several epic arcs produced by the game

software, their teacher, and player interactions.

This depth of interaction provided a rich experience of a wide range of social studies concepts from economics and trading systems, social mobility, racial interactions, colonization, refugee challenges, political and diplomatic dispute resolution, to the causes and effects of warfare. Transference of the experiential learning occurring within the Secondary World, made rich by student engagement with and ‘belief’ in this world, was assessed through multiple classroom observations, pre and post interviews with students and teacher, transcript analysis of chat logs, and analysis of player actions and choices within the computer game. Student engagement with the game and classroom learning tasks was higher overall amongst those students that engaged with the game as a Secondary World than those who treated it abstractly as just a game, though initial engagement was stronger for those who focused on competitive gameplay as engagement with the Secondary World took time to develop. Ultimately the complexities of existing classroom social dynamics strongly influenced gameplay and resulted in a mixing of Secondary World and Primary World interactions, highlighting the difficulties of any attempts to insulate the influences of one world on the other, and the need to accommodate such influences in the use of computer games in education.

## **SimSchool**

The second example of Secondary Worlds to transfer learning was explored through an EDUCAUSE funded research project into the use of the computer game SimSchool where over 1000 preservice teachers over two years at a metropolitan Australian university experienced the complexity of managing a differentiated learning classroom environment. SimSchool generates a classroom simulation for preservice teachers to use an experimental inquiry process to analyse student differences, adapting instruction to individual learner needs, gathering data about the impacts of instruction, and seeing the results of their teaching choices. In the first year of the study preservice teachers had difficulty believing in the simulated world of SimSchool, with the caricatured students and simple, stylized classroom environment of insufficient depth to generate a Secondary World. To address this, the game characters were replaced with characters from the television series *The Simpsons*. Having run over 25 seasons, most preservice teachers had spent their entire life watching the show and knew the student characters and classroom setting of the fictional school in great detail. By using the Secondary World of *The Simpsons*, preservice teacher engagement with the SimSchool game increased by 34% (comparison with the previous years usage data over the ten week usage period) and scores in gameplay of their effectiveness in differentiating learning improved by 28%. Preservice teacher surveys, interviews, screen recordings, and focus groups indicated a strong preference for the change and future analysis aims to determine the degree of improvement in learning of differentiated instruction as a result of activity engagement or support to cognitive processes, including transfer, of the Secondary World.

## **Conclusion**

Journeying between worlds is not for the faint hearted, and creating Secondary Worlds for learning is difficult and not without risk. Games however provide opportunities to go well beyond the scope to which they were created, where their Secondary Worlds become far greater than their initial narrative and game play, to become subcreations with their own existence. Teachers and students can build upon such foundations, to produce complex Secondary Worlds that can sustain deep learning and engagement. Tolkien first envisaged a Secondary World of sufficient depth in which he could comfortably place the mythical languages that were his passion. The Secondary Worlds that teachers and students create should be no less a space for their passions and interests to grow and flourish, safe from the vicissitudes of the real world, and used in preparing students for the Primary World by teaching them the extent to which they can master, control and contribute to all worlds.



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