A Conceptual Teacher-Learner Model for a Collaborative Learning with Serious Games

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Abstract: This paper introduces a conceptual Teacher-Learner framework for a collaborative learning with serious games. An initial study identified twelve attributes of educational serious games that can be used to support effective learning. These attributes are used in the conceptual framework to support learning and pedagogy in combination with a game. A considerable number of serious games have been developed over the last ten years, with varying degrees of success. Due to a lack of clear standards and guidelines for game developers; it is difficult to justify claims that a specific game meets the learner's requirements and/or expectations. This paper defines a conceptual model for serious games that will contribute to their design and the measurement of achievement in meeting the learners' requirements.

A Conceptual model for collaborative learning

The framework is an evolution of the input-process-outcome game model discussed by Garris et al (Garris, Ahlers, & Driskell, 2002), the conservation framework by Laurillard (Laurillard, 2009) and the conceptual framework presented by Yusoff et al (Yusoff, Crowder, & Gilbert, 2010; Yusoff, Crowder, Gilbert, & Wills, 2009). The individual components of the model are discussed in this section.

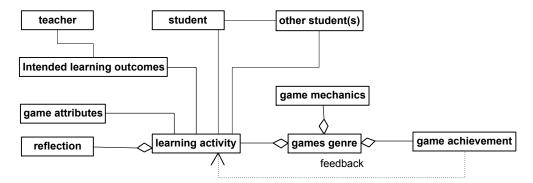


Figure 1: Conceptual Framework for Collaborative Learning shown as a Structural Class diagram.

Game attributes

Game attributes are those aspects of a game which support learning and engagement. The game attributes are developed based on the critical thinking resulting from the literature review on behaviorist, cognitive, constructivist, educationist, and neuroscience perspectives (Yusoff et al., 2009), as listed in *Table*. The serious games framework presented in this paper identifies the major components that create an effective model for learning through the use of serious games. Every component inside this framework plays a role to ensure that learning would take place while playing the game. We propose this framework as an appropriate basis for effective serious games design for designers and teaching practitioners.

Attributes for Serious Games	Values for Learning and Education
Incremental learning	Learning material is delivered incrementally. Additional new knowledge is delivered and not done all at once. It will have a proper start and end section. Learner feels and learns in a natural way and less complex.

	
Linearity	Learning will be in sequence. This will suit the sequential learner. However,
	due to the games flexibility, active
	learner can skip chapters.
Attention span	This concerns with the cognitive
	processing and short-term memory
	loads placed upon the learner by the
	game. These loads need to be carefully calibrated to the target learner Not to be
	overwhelmed and too long in the
	learning process.
Scaffolding	Support and help during learning within
e canonanig	the games.
Transfer of	Learnt knowledge to apply to other
learnt skills	skills in the next level.
Interaction	Higher engagement, higher learning.
Learner control	Active learning, self study and self
	exploration based on individual pace
	and experience.
Practice and	Repeating for harder task, better
drill	knowledge retention and can have
Intermittent	plenty of game activities for drills. Learner to reflect on what has been
feedback	achieved so far and motivated for
IEEUDACK	higher score (higher learning). Also
	using just in time feedback for learning.
Reward	Encourage learner and keep motivated.
	Negative reward as punishment within
	the game may also contribute to
	learning.
Situated and	Learning where the learner can relate
authentic	what is being learnt within the game to
learning	the outside world.
Accommodating	To suit and to reach out to different
the learner's	learner styles.
styles	

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