Using Games in Higher Education

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Abstract

The advent of the information superhighway has heightened interest in the use of educational games for learning in both schools and universities as well as in the workplace. Studies by Sauvé et al. (2005a; 2003; 2002) and Baranowski (2003) show that games create favourable conditions for learning. To promote the use of games, a longitudinal research project, *Simulations and Advanced Gaming Environments for Learning*, (SAGE) examines, among other things, how generically designed educational gaming environments for learning take into account learner needs and training content while providing effective learning conditions. This paper will distinguish between games for learning and other learning activities and it will describe their impact on learning.

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The advent of the information highway has heightened interest in the use of educational games for learning in both schools and universities and the workplace. Studies by Sauvé and al (2005a; 2003; 2002) and Baranowski (2003) show that games create favourable conditions for learning. To promote the use of games, a longitudinal research project, *Simulations and Advanced Gaming Environments for Learning*, (SAGE) examines, among other things, how generically designed educational gaming environments for learning take into account learner needs and training content while providing effective learning conditions. This short paper presents a definition for educational gaming which distinguishes it from other learning-related activities and types of learning.

A game is based on a fictitious, whimsical or artificial situation in which players are put in a position of conflict. At times, players square off against one another; at other times, they are together and are pitted against other forces. Games are governed by rules which structure action according to a goal or a purpose which is to win, to be victorious or to overcome an obstacle. The following essential game attributes, based on Sauvé et al., 2005b, will now be examined in depth:

- A **player** is an individual or **players** are a group of individuals who are put in a position of assuming a role or of making decisions within a game context. A game cannot work without at least one player (Griffiths, 1997) or several players (Gosen & Wabush, 1999). An individual can play only against him or herself (in which case we would speak of a competition against oneself where the purpose is, for instance, to win the perfect match, to improve on one's score from one match to the next, etc.), or one can play with others (which would lend the game a cooperative character) or one can play against others or against the computer (which would lend the game a competitive character). Although the number of players may vary from one to infinity, there is usually either a prescribed number of players or a variable number of players within a given range.
- **Conflict** is represented in games by dynamic, human or computer-controlled obstacles which prevent a player or players from easily reaching his/her/(or) their goal. Obstacles must be active, even "intelligent", to create conflict and may, minimally, provide the illusion of reacting to player action (Kasvi, 2000). Conflict also includes the notions of struggle, competition and challenge which motivate the players to maintain their gaming role and to make decisions. Struggle is often used as a synonym for conflict and is defined in the same sense. In games such as Chess, Bridge, etc., a struggle or competition exists between players or between teams. Competition is present as much in single-player games (which require that a player improve his or her performance from match to match) as in team games (which require that one team be first in winning the game). In solitary games, conflict takes the form of a confrontation between the player and luck (Solitary, roulette, etc.) or between oneself and another player who uses a decision algorithm such as the computer. Cooperation emerges when players ally themselves against other players in order to reach a common goal. Always present in team games, group tasks are required (Gray et al, 1998) which are governed by rules. In team games, levels of cooperation and competition vary and must therefore be moderated by rules to make sure that all team members master the contents.
- **Rules** are a set of guidelines which can be either simple or complex and which describe the relationships existing between players and the game environment. These guidelines specify the extent and the nature of allowable player action and they establish the sequence and the structure according to which participant actions may take place (Gray et al., 1998). Rules perform three types of functions (Stolovitch & Thiagarajan, 1980). Procedural rules describe the game components, that is, the number of players or the number of teams, the role of each of the

participants, their activities and the move or moves that can be made. Game-over rules govern how the game is won and specify the results as well as the limits expected from each player. Control rules describe the consequences for players who do not follow the previous rules (Martin et al, 1998). For example, a player who makes false accusations is excluded from a detective game. Brougere (1999) states that rules must be clear, organized, complete, pre-set and accepted by all players before starting a game. Without such pre-set rules for and recognized rules by all players, a game becomes a playful activity where one or several players are free to create their own rules or modify them according to their whims and/or game progress (De Grandmont, n.d.).

- The p**redetermined goal of a game** refers to the end of the game and to the notion of victory, winning or reward (Salopek, 1999). It indicates how the game ends and, for educational games, it includes the objectives which the player(s) seek to attain. It is governed by rules which determine (1) who wins and, often, who loses, (2) when and how the game can end. These rules may also specify time limits as well as points accumulation limits leading to success or elimination. The desire to reach this goal affects choices made by players during a match. According to game type, this may involve overcoming an opponent or opponents by competing in skill and craftiness with him/her/or them, or by triumphing over chance or overcoming an obstacle in the aim of winning, of being victorious or of being rewarded.
- The **artificial character** of games refers to two rather different notions according to the authors consulted. For Sauvé & Chamberland (2003), it is a fictitious activity without reference to reality (for example, the Tic Tac Toe game) or that escapes the usual confine which apply to reality. In this sense, Bingo or card games do not refer to reality. It is through immersion in such a fictitious situation that a player can experience a fun, unreal and sometimes even absurd dimension. If the limits of reality were applied, the activity would no longer be a game. Garris et al (2002: 240) refer to this fanciful aspect which they define a constructed environment as “mental, physical or social images which do not exist”. This attribute is not unanimous in the research community. Several authors tend to omit defining game attributes which allows them to include the notion of reality (Eyraud, 1998; Crawford, 1999; Kasvi, 2000). However, some authors might qualify such as being simulation games.

An activity is thus a game when it possesses the attributes described previously, as is the case of chess. Regularly playing chess makes us better at it but it does not, for that matter, make chess an "educational" game. De Grandmont (n.d.) states that a game which is not used in an educational or a pedagogical context is a game for fun. Essentially, the purpose of an educational game is only implicitedly centred on learning since it is hidden from the player and the notion of pleasure which it engenders is rather extrinsic whereas the purpose of a pedagogical game is clearly focused on the duty of learning and it is explicitly identified as such, appealing to the intrinsic pleasure of performance. In both cases, games have to contribute to learning which we define as a process of new behavior or knowledge acquisition through the influence of interaction with one’s environment. According to the authors consulted, learning by games translates into the acquisition of new knowledge, the transfer of learning, the development of intellectual skills (abstraction, anticipation, strategy-building, problem-solving, lateralization, spatial representation, function-movement relationships), the development of behavior and attitudes, etc.

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