

Chapter 16

Games that Motivate to Learn: Design Serious Games by Identified Regulations

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ABSTRACT

It is commonly acknowledged that intrinsically motivated learning makes for better students. Yet, facilitating students to become intrinsically motivated to learn is difficult, if not, impossible to accomplish. As every student has different and personal intrinsic needs, the design of regulations that satisfy intrinsic needs may seem an unfruitful approach to serious game design. Inspired by research to the beta-version of the second language game CheckOut!, this chapter proposes a different approach to serious game design, based on identified regulations.

Identified regulations are negotiations with personal valued rules. The regulations can be positioned between external regulations (based on punishments and rewards) and intrinsic regulations (based on a personal willingness to act). To develop identified regulations, game designers should create a correspondence between the game regulations and the student's perceptions about the educational instruction.

To accomplish this fit, game designers could not conceal the learning within a game, but explicitly communicate the constructed knowledge to the player. Progressive feedback, the availability of various learning styles in the game, and the embedding of the game in a social environment, might satisfy students' needs for competence, autonomy and relatedness to significant others. When these needs are satisfied within the context of the educational instructions, students might become motivated to learn during play, and even when the game is over.

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INTRODUCTION

‘Hello! I am Stella, your tour guide for *DreamBox Learning K-2 Math*’, Stella, a red-haired girl welcomes us to the world of sums and equations. We are ‘playing’ *DreamBox*, an internet application designed by DreamBox Learning Ltd. (2009a) for middle school students. By solving equations and other math exercises, students can explore an imaginary world of dinosaurs and fairies. *Dream-Box* is an example of e-learning applications that uses game-elements to make ‘serious learning, serious fun’ (Dreambox Learning, 2009b).

There are many motivational features that can enhance the initial enjoyment for equating in *DreamBox*. These features consist of scoring points and unlocking mini-games or cinematics¹. Educational applications like *DreamBox* rely excessively on punishments and rewards. As research shows, these external regulations may diminish motivations for learning (Arnold, 1976; Lepper, Corpus, & Iyengar, 2005)². Furthermore, external regulations may obscure the learning content; they may change the player’s focus from learning to scoring points and avoiding failures.

Many of today’s serious games are based on external regulations. Players are often encouraged to (learn or) play by the prospect of gaining victory over a classmate, increasing one’s high score or receiving a particular award. We propose a different regulation to motivate learning, called identified regulation. Identified regulations are defined by Ryan & Deci (2000) as the negotiations with personally important-, and consciously valued rules and goals. We argue that identified regulations are a more feasible approach to serious games than external regulations. Identified regulations may motivate learning during play, *and* after the game is over.

This hypothesis is inspired by Deen’s (2009) validation of the second language learning game *CheckOut! (Beta Version)* (Ranj Serious Games & ROC West-Brabant, 2010). The game is designed with identified regulations in mind. Deen found a

change in students’ motivation towards traditional³ second language instruction. Although not fully implemented, certain identified regulations may account for this motivational change.

We argue that games can change students’ motivations to learn for the better. By designing a game through identified regulations and by satisfying three basic human needs (competence, autonomy, and relatedness), students may become motivated to play and learn, even when the game is over.

NEED THEORY: COMPETENCE, AUTONOMY, AND RELATEDNESS

Game theorist Sutton-Smith assumes that ‘psychological factors operate internally to determine the range of gratifications that the players will get from the activity and the needs that it will meet’ (1959, p. 24). The psychological factors that determine motivations are researched in what is called *Theory of Needs*, a part of cognitive psychology. According to Need Theory, (possible) need satisfaction is an essential condition to act. Specific goals, rules and activities (called regulations) may satisfy a particular need and in turn motivate to act.

It remains difficult to pinpoint which needs are satisfied through which regulations. People in different circumstances have different needs. The personal character of needs is stressed by Reiss’ theory of sixteen basic human desires (2004, 2009), for example needs for vengeance, eating, and romance are circumstance dependent. Most likely, these needs are not always of main importance to learning processes, nor are other basic human needs, like physiological needs or needs for safety (Maslow, 1943).

The needs and regulations described by self-determination theory (Ryan & Deci, 2000) fit an educational environment better. Ryan & Deci defined three types of motivation: *amotivation*, *extrinsic motivation* and *intrinsic motivation*, as

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