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# Socio Cognitive and Affective Processing in the Context of Team-Based Gamified ERP Training: Reflective and Impulsive Model

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## ABSTRACT

Team-based enterprise gamification is designed to support teamwork and increase productivity within the organization in order to derive positive business outcomes through its own employees. While there have been a number of studies on gamification, they have mainly focused in the individual as the unit of analysis. Based on Reflective and Impulsive Model, the purpose of this study is to examine the effects of team-level reflective and impulsive determinants in the context of gamified ERP training. Our research model proposes that team absorptive capacity and team mood influence individuals' ERP competence and hedonic motivation, which in turn affect intention to learn about ERP systems.

## Keywords

The Reflective and Impulsive Model, Team-Based Gamification, Training, ERPsim

## INTRODUCTION

During recent years, gamification “the use of game elements in a non-game context” (Deterding et al. 2011, p. 10), has emerged as a trending topic. Gamification has been utilized to improve organizational productivity (internal or enterprise gamification), increase customer loyalty (external gamification), and form socially desirable behaviors among a population (behavioral-change gamification) (Werbach and Hunter 2012). The primary objective of gamification is “to effectively motivate and direct the users’ behaviors and to increase the users’ engagement with the ‘play’ tasks by using game-like techniques that make people feel more ownership and purpose when engaging with the play task” (Sigala, 2015, p.182).

The focus of this study is on team-based enterprise gamification. Enterprise gamification penetrates various business processes including decision making, innovation, team work, and training (Sigala 2015). One example of enterprise gamification is the enterprise resource planning (ERP) simulation game (ERPsim: Leger et al. 2007). Because of its complexity, an ERP system has major training challenges (Léger et al. 2011). ERPsim has been shown to positively influence users’ actual ERP skill improvement and knowledge gains when using an ERP system (Léger et al. 2015). In particular, ERPsim supports teamwork which facilitates collaboration within a team and competition between teams.

However, prior research on gamification and ERPsim has mainly focused on the individual as the unit of analysis. *Team* is an important game component (Werbach and Hunter 201), and thus has been widely used in game design. While prior empirical studies on gamification have examined various game elements (Hamari et al. 2014), they have not paid much attention to the team. Since team-based gamification is designed to motivate not only individuals but also teams as a whole, it is important to examine individuals’ motivations in a team context (Kang et al. 2012).

One theoretical perspective that can help us understand how certain aspects of gamification influence user behaviors is the reflective-impulsive model (RIM: Strack and Deutsch 2004). As a dual-system model that assumes social behavior is the result of the operation of two distinct systems of information processing, RIM classifies information processing mechanisms

into reflective and impulsive systems. While RIM shows the effect of reflective and impulsive determinants on user behaviors, it does not account for team level constructs in a specific environment. Given the importance of team-based gamification and theoretical gap in RIM, the purpose of this study is to propose the effects of team-level reflective and impulsive determinants in the context of ERPsim.

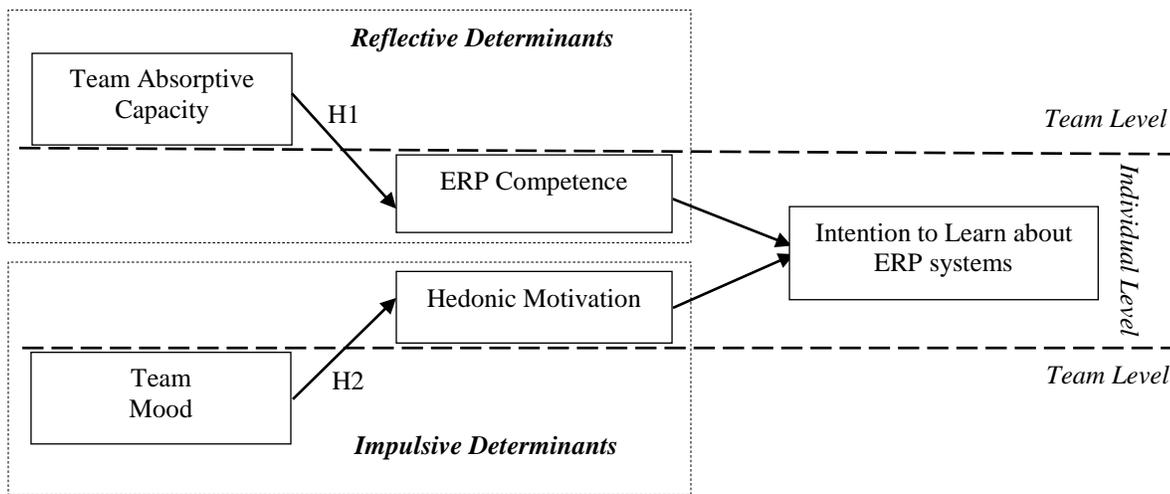
**REFLECTIVE AND IMPULSIVE MODEL**

According to RIM (Strack and Deutsch 2004), social behavior is the joint function of two distinct systems of information processing; a reflective system and an impulsive system. These two systems follow different operating principles. The reflective system generates behavioral decisions based on knowledge about values or facts and the probability of possible consequences, whereas the impulsive system engenders quick and spontaneous behavior through associative links and motivational orientation. In particular, the two systems require different cognitive capacities. The impulsive system is fast, requires no or little cognitive resources, and has a low threshold for processing information. The reflective system requires a high cognitive capacity and greater attentional resources. Therefore, the reflective system is slower and individuals using it can be more easily distracted than those utilizing the impulsive system. Furthermore, relations between elements in the two systems have different patterns. In the reflective system, elements are linked via semantic relations to which a fact or value is assigned. In the impulsive system, the elements are connected via associative processes of spreading activation, and the relations are formed based on principles of contiguity and similarity.

The reflective system is elicited as the consequence of a higher order reasoned action, and it is responsible for producing rational judgments and executive decisions. Alternatively, processing external cues in the impulsive system generates three types of feelings: (1) feelings associated with the physical senses, such as colors, sounds, and tastes, (2) positive or negative affective feelings, such as happiness or anger and (3) cognitive feelings, such as familiarity or ease (Strack et al. 2006, p. 208).

**RESEARCH MODEL AND HYPOTHESES**

The research model of this study is presented in Figure 1. Since the effects of individuals’ competence and hedonic motivation on behavioral intention have been well established, we focus on the cross effects of team level constructs on individual level constructs.



**Figure 2. Research Model**

**Team Absorptive Capacity**

Prior research has examined the concept of absorptive capacity at both the individual and organizational levels. Absorptive capacity has been generally defined as an individual’s or an organization’s ability to identify, acquire, assimilate, and apply new information or knowledge (Cohen and Levinthal 1990). Volberda et al. (2009) indicated that absorptive capacity is a multilevel construct and should be examined at the individual, team, firm, and inter-firm level of analysis. Thus, team absorptive capacity refers to a team’s ability to identify, acquire, assimilate, and apply new information or knowledge (Zhang et al. 2011).

We expect that team absorptive capacity positively influences a team member's ERP competence (i.e., cross-level effect). A team with high absorptive capacity can apply new knowledge effectively via teamwork during an ERPsim game. For example, such a team can better utilize ERP concepts and business process knowledge in the simulation context compared to a team with lower absorptive capacity. Cabrera et al. (2006) suggested that an effective team can facilitate information sharing among team members, which can contribute to greater levels of knowledge acquisition among team members. In addition, team capability to streamline the internal processes could help members share knowledge and see the potential value of their knowledge exchange (Tsai and Ghoshal 1998). In turn, team members are able to recognize what to learn and to increase the quality of their ERP learning (Chou et al. 2014). Thus, team absorptive capacity effectively distributes the assimilated knowledge to team members and increases their ERP competency. Thus:

*H1: Team absorptive capacity positively influences individual's ERP competency.*

### **Team Mood**

This study defines team mood as the affective state of a team during ERPsim. At the individual level, prior researchers have observed the positive relationship between mood and hedonic motivations. In the context of online purchasing, for example, Parboteeah et al. (2009) argued that mood relevant cues (e.g., visual aesthetics) can influence a user's mood when visiting a website, making the user's interaction with the website more or less enjoyable.

Past research has conceptualized and theorized affect at team level. For example, Jinnett and Alexander (1999) found that group-level job satisfaction was associated with intention to quit, regardless of employees' individual-level satisfaction with their jobs. They pointed out that group-level emotions in work settings have direct and interactive relationships with individuals' perceptions, attitudes, and behaviors and that this effect is independent of individual job attitudes (Kelly and Barsade 2001). According to Schwarz's (1986) notion of feelings as information, positively valenced emotions inform individuals that the world is a safe place, one characterized by the presence of positive outcomes. The halo effect of shared emotion of team members carries over to the gameful experience of ERPsim. Because of its affective nature, team mood is likely to influence team members' hedonic motivation. Thus:

*H2: Team mood positively influences hedonic motivation.*

### **DISCUSSION AND CONCLUSIONS**

Our research provides a potential theoretical contribution. This study extends RIM by examining team-level reflective and impulsive determinants. While prior IS studies (e.g., Soror et al. 2015) utilized RIM to understand dual perspectives which determine user behaviors, they were limited in explaining the dual perspective in a team context. Based on RIM, this study viewed team absorptive capacity and team mood as team-level reflective and impulsive determinants of individual-level reflective and impulsive determinants (i.e., ERP competence and hedonic motivation, respectively), which in turn influence users' intention to learn.

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