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Reprint: The impact of critical thinking disposition on learning using business simulations☆

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ABSTRACT

This research seeks to determine the relationship between students' critical thinking disposition and their learning while engaging in a business simulation at a UK higher education institution (HEI). The research informs educators making decisions about the use of simulations as to the value of considering critical thinking dispositions. Previous research has found that simulations are an effective way for students to engage actively in learning, bridging the gap between theory and practice. It has also been found that such simulations can develop students' critical thinking skills. However, hitherto no research has been undertaken into the role that existing critical thinking disposition has on the learning of students, as measured by the degree to which students perceived that they met the module's intended learning outcomes. This research offers insights into the role and importance of critical thinking disposition and its component dimensions and how this impacts student learning. The results indicate that the level of critical thinking disposition is positively related to the students' learning. The implications of the research suggest educators should target business simulations at specific cohorts of students. The relative importance of the critical thinking disposition constructs and the practical educational implications of these findings are discussed.

1. Critical thinking skills and critical thinking disposition

The term critical thinking is widely used in the fields of education, psychology, and philosophy, and there have been repeated attempts to define the concept in order to increase the understanding of how this cognitive ability can be utilised (Friedel et al., 2008).

An early definition by Dewey (1933, p. 118) described critical thinking as "active persistent and careful consideration of a belief or supposed form of knowledge in light of the grounds that support it, and the further conclusions to which it tends." More recently, critical thinking has been defined as being the "purposeful, self-regulatory judgement, which results in interpretation, analysis, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgement is based" (Facione, 1990 p. 2). Halpern (1996, p. 5) defined critical thinking as "thinking that is purposeful, reasoned and goal directed – the kind of thinking involved in solving problems,

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formulating inferences, calculating likelihood, and making decisions." Critical thinking is essential as a tool of enquiry (Facione, 1990) and has been argued to be under-emphasized at the business school level (Örtenbald et al., 2013). It is believed to be vital for individuals to achieve their full potential (Meyers, 1986) and to be one of the most valuable attributes for success in the twenty-first century (Huitt, 1998).

Critical thinking skills, however, are not stand-alone abilities. An individual requires the appropriate critical thinking disposition to use those skills (Friedel et al., 2008; Tishman, Jay, & Perkins, 1993). A critical thinking disposition can be defined as the consistent internal motivation to engage problems and make decisions through the use of critical thinking (Facione et al., 1995) and is a measure of the tendency towards critical thinking (Stedman & Andenoro, 2007).

Critical-thinking dispositions are attitudinal and can be developed, although their development may take longer than the development of critical thinking skills. Approaches that develop critical thinking skills can also improve critical thinking disposition (Tishman & Andrade, 1996). Research has suggested that, being inherently linked, both critical thinking skills and disposition should be developed together (Kitchener and King 1994). This was supported by Facione et al. (1995), who argued that, as skills and dispositions are mutually reinforced, they should be modelled and taught together. Importantly, critical thinking dispositions are precursors and gateways to critical thinking activity. A lower disposition is less likely to result in meaningful critical thinking that leads to problem solving, solutions, and decision making, whilst a higher disposition would be more likely to lead to these outcomes (Irani et al., 2007).

Two frequently adopted measurement instruments for critical thinking dispositions are the California Critical Thinking Disposition Inventory (CCTI) (Facione et al., 2001), and the University of Florida Engagement, Cognitive Maturity and Innovativeness assessment (UF-EMI) (Irani et al., 2007), which was developed from the former.

The UF-EMI instrument has been used to investigate critical thinking disposition across a wide range of academic study, including emotional intelligence (Stedman & Andenoro, 2007), the development of study programs (Lamm et al., 2011), and problem solving (Friedel et al., 2008). It will be adopted in this research and consists of 26 items based on three constructs, namely, engagement, cognitive maturity, and innovativeness. The three dimensions (constructs) of critical thinking disposition are described (Irani et al., 2007; Ricketts & Rudd, 2004) below.

Engagement is the predisposition to look for and anticipate situations that require reasoning, the use of reasoning skills, and confidence in one's belief to reason, solve problems, and make decisions. Engagement results in a desire to use reasoning and communicate the reasoning process used to come to a decision (Irani et al., 2007).

Cognitive maturity is the predisposition to be aware of the complexity of problems, open to the viewpoints of others, aware of predispositions and biases of one self and others, and to consider these factors objectively before making decisions. Cognitive maturity results in an acceptance that problems are often more complex than they may first seem and as such there may be more than one appropriate solution.

Innovativeness is the predisposition to seek out new knowledge, be intellectually curious, and seek out the truth. Individuals displaying innovativeness want to know more about their profession, their life and the world around them, even if this is at odds with their own beliefs and opinions. They are constantly seeking new knowledge (Irani et al., 2007; Ricketts & Rudd, 2004).

2. Business simulations in higher education

The development of critical thinking skills is high on the agenda for HE establishments (Halpern, 1998; Kovalik & Kovalik, 2007; Roth, 2010; Stassen, Herrington, & Henderson, 2011), and educators' teaching methods need to be adapted carefully to build on the students' current critical thinking skills in order to develop them further. Educators increasingly use virtual learning environments as a way to communicate effectively with students. Morris and Chikwa (2014) found that students who utilized e-learning to supplement their classroom-based studies experienced increased academic performance. The use of computer simulations provides an e-learning medium for active engagement and the utilization of critical thinking skills in a risk-free environment. Business simulation games are a form of computer simulation that have become increasingly popular for business studies in higher education establishments, enabling educators to provide a bridge between theory and practice via active engagement.

Computer-based simulations aim to provide an operating representation of the central features of reality (Guetzkow, 1963) by imitating a system, entity, process, or phenomenon (Lean et al., 2006). The use of simulations as an educational tool has grown considerably over the last forty years. Encouraged by the widespread availability of computers and the Internet, they have become an important part in business education (Faria et al., 2009). Increases in computer power, availability, and graphic capability have all played a part in this rapid development (Kirriemuir, 2002) and the increase in the sophistication of computer technology has now enabled the simulation of realistic situations in computer programs (Martin & McEvoy, 2003).

A business computer simulation is, in essence, a model or software program that requires participants to make business decisions. The most popular business computer simulations used in business and management education are gaming simulations (Adobor & Daneshfar, 2006). Computer simulations have been classified in several ways, including on the basis of their use, e.g., gaming, training and modelling (Lean et al., 2006) or on the underlying model of the simulation, i.e., discrete, continuous, or combined event (Feinstein, Mann, & Corsun, 2002).

Simulations can play a role in two areas of development. Firstly, they can provide a teaching framework in which participants make decisions to achieve their final goal, taking into consideration how the other participants' decisions will affect their own choices (Lainema & Nurmi, 2006). An individual's cognitive style, referring to the different but consistent way in which an