Understanding of Business Simulation learning: Case of Capsim

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Abstract

Purpose – According to the importance of business simulation learning as a new type of business learning tool, this study reviews the dimensions of business education and a brief history of business education simulation. At the end Capsim strategic management simulation program is introduce with its feature.

Research design, data, and methodology – This study has been analyzed in a way that reviews at previous literature on simulation learning and looks at examples and features of Capsim simulation, online business simulation tools which has been used in the global market.

Result – Capsim simulations are designed to offer focused opportunities for deep practice. That's why they are often more effective than passive tools such as textbooks, videos, or lectures. By the way, 'deep practice' is very different from 'ordinary practice'. After commuters who drive to school or work can accumulate thousands of hours of driving, but that doesn't make them expert drivers. The key to deep practice is self-awareness. That is, paying attention to what you are doing well and not so well. This is so important to learn that scientists use a specific term for it: 'metacognition', or thinking about the way you think and learn.

Conclusion – The use of business simulation learning, such as Capsim, which is a given case, can create similar local systems by potentially engaging a large number of users in the virtual market. It could also be used as an individual to complete business training for students and those who are active in the business field of business.

Keywords: Online Business Simulation Learning, Simulation Game, Gamification

JEL Classification Code: A20. M53.

1. Introduction

The fourth industrial revolution is affecting business and management education methods and learners' attitudes and viewpoints. Due to these changes in the environment, it is becoming difficult for business and management learners to engage in learning with basic knowledge in various management areas, and the time to invest in learning, training, and education is decreasing. In addition, since traditional business training methods (lectures, discussions, management cases, etc.) are focusing on past cases and theory, in order to prepare for the rapid changes of the corporate environment, a new business teaching method is required (Lee, 2012). Higher learning institutions are seeking ways to measure learning outcomes in undergraduate and MBA programs etc.

As the Fourth Industrial Revolution approaches, technology allows various schools of higher learning to incorporate virtual business simulations in to the learning platform. In an effort to create a learning environment where students can successfully apply academic lessons to real world organizational environments, Universities are turning to concepts such as business simulations. Ahn (2008) points out that approximately 95% of The Association to Advance College Schools of Business (AACSB) schools are using some type of business simulation to track learning outcomes (Forsyth & Anastasia, 2016).

Hall (2003) presented simulations are used to teach a specific process (the practice) within a specific environment (the context). Simulation replicates aspects of real environments through models. They can be used for extrapolating theory, validating hypotheses, or revealing emergent behavior (Mahboubian, 2010; Washington, 2007). Hall (2003) also argued that a computer-based simulation replicates an environment through a computer program designed to consider multiple variables, interactions, and system constraints. Computer-based simulation methods can advance organization studies research in many ways. They can be used for extrapolating theory, validating hypotheses, or revealing emergent behavior (Washington, 2007). This is probably the most common type of simulation and about 60% of commercial e-learning courses available today deal with software application or IT topics (Mahboubian, 2010).

According to the importance of business simulation learning as a new type of business learning tool, this study reviews the dimensions of business education and a brief history of business education simulation. At the end Capsim strategic management simulation program is introduce with its feature.

2. Literature Review

2.1. The history of business games

Wolfe (1993) and Hodgetts (1970) argued together that the history of business (simulation) games can be traced back about 5000 years to the development of board games and war games.

Table 1: The movement of business games

Phases	Contents
Phase I (1955 to 1963)	Creation and growth of hand scored games
Phase II (1962 to 1968)	Creation of mainframe business games and growth of commercially published games
Phase III (1966 to 1985)	Period of fastest growth of mainframe games and significant growth in business game complexity
Phase IV (1984 to 2000)	Growth of PC based games and development of decision-making aides to accompany business games.
Phase V (1998 to present)	The growth of business game availability on the internet and run through central servers (e.g., Capsim and the Capstone series of business games and Innovative Learning Solutions and the Marketplace simulations)

Source: Faria, et al. (2009), (p.466)

Wolfe (1993) addresses an extremely interesting history of board and war games from their beginnings in China in 3000 B.C. and their development through modern war games. Campion (1995) discusses the computerization of war games in the mid-1950s (Faria, et al. 2009). The modern business simulation game dates to 1955. In 1956, the first widely known business game, Top Management Decision Simulation, was developed by the American Management

Association (AMA) (Meier, Newell, & Pazer, 1969) for use in management seminars administered by the AMA (Mahboubian, 2010).

Faria, et al. (2009). described the movement of business games from hand scored to personal computers in terms of fifth phases, adding a fifth to Wolfe's (1993) initial four phases as the follow table.

2.2. Gamification and Business Education

Experience-oriented methods currently widely used in business education include cooperative learning, exploration activities, games, and experiments (Hahn, 2010), and games are the most attractive means of education to motivate double learning (Kim & Park, 2016). Gamification refers to the application of elements of games in non-game fields to motivate participants (Hananna, 2018; Deterding, et al., 2011), which was first proposed in 2003 by British game developer Nick Pelling (Lee & Na, 2019). In other words, the idea is that people can happily immerse themselves in any activity by combining game elements such as achievement, reward, competition, and challenge in a non-game setting. The concepts and components of gamification vary slightly depending on researchers. Zichermann & Cunningham (2011) defined gamification as the process of using game thinking and game mechanisms to attract participants to problems and solve them. Huotari & Hamar (2012) introduced gamification as the process of enhancing services by inducing the gaming experience to create user value. Schoech, et al. (2013) defines game technologies and devices for changing learners' or users' behavior as gamification through encouraging learners' or purchasing incentives, rewards, or bonus points. According to prior studies, although it depends on researchers, gamification in common is a strategy that motivates users to solve problems or lead them in a better direction.

Recently, companies have also combined these gamification concepts with the company's information system to promote knowledge contribution activities among organizational members. Suh & Wagner (2017) surveyed 166 users of a global consulting firm that uses a gamified information system for knowledge sharing, and examined psychological responses to game elements, perceptual pleasure, and knowledge contribution activities. As a result, gamification can promote rewardability, competition, and visibility of performance to information system users, which users perceive as interesting in their knowledge contribution activities. It was also shown that the more you perceive your knowledge contribution activities as enjoyable, the greater the amount and quality of knowledge contributed.

A game developed for educational purposes is called 'Serious Game'. The term "serious game" comes from the 1987 book 'Functional Game' by social scientist Clark Abt. Michael & Chen (2005) called entertainment, interest, and fun a game that is not primarily intended for entertainment, Zyda, et al. (2005) not only entertainment, but also mental competition that includes specific rules for government or business training, health, public policy and communication purpose strategies. Sawyer (2007) saw computer-generated games as the source of the game industry as not just fun-seeking games that could be used significantly in any field, Susi, et al. (2007) further developed to solve problems faced by businesses and organizations. It is also used in the United States and European countries as a useful tool to help society across purposes and intentions (Zyda, et al., 2005; Sawyer, 2007; Alvarez, et al., 2007; Marsh, 2011; Jeong & Lee, 2013).

The crafted gaming environment and systems of functional games allow learners to efficiently utilize cost and time in a safe environment that is impossible in real life (Corti, 2006; Squire & Jenkins, 2003). Functional games are defined in various ways by existing studies, but generally, the objective for this experience is defined as a key concept.

As a domestic study on gamification, Han (2018), who analyzed 131 gamification research papers according to the timing, purpose, research type, research method, and research results, is an important reference. The author confirmed that the trend of gamification research has been increasing quantitatively since 2011, and that research topics and applications have also expanded to various non-game contexts. Among them, 45 studies published quantitative analysis of application effects, and most of them dealt with psychological effects. The author suggested that there is little literature analysis on research in the field of education, so research to view the elements and effects of gamification used in various educational contexts is needed. To this end, he argued that an accurate understanding of the principles of gamification design and how to implement it should be supplemented.

Many studies have been conducted to identify the effectiveness of gamification by combining it with economic and financial education. Noh & Lee (2005) developed a simulated courseware that applied situational and procedural simulation techniques to enhance self-directed learning skills in elementary school economic education and tried to compare the courseware before and after use. The findings confirm positive results in a definitive area for rational consumption life by cultivating the ability to self-judge and respond to how to behave in certain situations through situational simulations.

Kim & Park (2016) suggested that financial problems in daily life need to be treated importantly even at the high school level. As a result of implementing financial education board game classes for 100 first-year high school students,

both the experimental group and the control group improved their financial comprehension, but the experimental group showed higher financial comprehension than the control group. Furthermore, the analysis of the correct answer rate by pre-examination of financial comprehension questions found that sample students had a very low level of financial comprehension, especially their lack of understanding of financial knowledge closely related to daily life. In this regard, Kim (2020) also stressed that financial education should be conducted that properly reflects the reality of finance, and insisted that not only financial knowledge but also education courses and related textbooks should be conducted steadily.

Min, Kim, & Park (2019) conducted 'Operation Force' games that incorporated gamification to transfer knowledge of basic economics such as 'demand and supply' and 'invisible hands' for engineering students to analyze its effectiveness. The analysis showed that the interest in economic activity, curiosity in economic activity, knowledge acquisition of economic terms, interest in economic activity, and understanding economic activity were all meaningful, and the game method naturally stimulated interest and curiosity.

Lee & Rha (2019) looked at overseas research and application cases related to gamification in the financial sector. Research shows that gamification positively affects consumers' perceptions and intentions of using financial products and services, understanding financial products and services, brand loyalty, and practical business performance. The authors also argued that applying gamification to financial consumer education could predict increased interest and interest in financial knowledge and financial information, increased financial understanding, and positive changes in financial behavior.

2.3. Functional game effectiveness assessment and data analysis

Functional games should be evaluated to verify their effectiveness in realizing the objective. There is a knowledge acquisition performance variable of the game as a variable that not only feels fun or pleasure through the game, but also determines that it is effective in improving knowledge, another purpose of the game. It has been used a lot in educational functional games. Educational functional game studies using knowledge acquisition performance variables were mainly conducted through similar experimental methods and surveys, and the performance variables measured knowledge acquisition, vocabulary acquisition, algorithm learning performance, and knowledge acquisition. (Yoon & Choi, 2016).

Current methods of evaluating the effectiveness of educational games can measure learning from the results that occur in the purpose of the game (Ends). However, they fail to measure the learning that occurs in this method (Means. However, it is more important to measure the effectiveness of educational games in the course of the game than to measure the effectiveness of the purpose (Leem & Wohn, 2009). Recent advances in digital game production and data analysis technology are expected to gradually measure the effectiveness of user data as it can accumulate from the game process.

A representative example of educational feedback using digital data is management simulation games. Studies related to management simulation games have many cases of applying reinforcement learning to confirm that game agents achieve a given goal autonomously. In these studies, reinforcement learning is defined primarily as an area to explore optimal behavior through control or interaction, and we learn how to map behaviors to states to choose behaviors that can maximize numerical rewards. In other words, investment, management, and loss, which are key system elements of management simulation, are defined as systems and developed into experimental management simulation games. Furthermore, it is to apply reinforcement learning to allow game agents to find their own actions that can earn maximum rewards. The experiment is scenario-based, and in each scenario, agents were asked to find optimal behavior patterns through reinforcement learning to reach the specified game goals. In other words, they studied the optimization of simulation through reinforcement learning (Liang, et al., 2019).

An American example of analysis and feedback on learning activities is Triump Learning and Coach, https://eps.schoolspecialty.com/coach) has developed an adaptive learning technology-based online learning platform, GET Waggle, and is applying it to English and mathematics education for third to second graders in elementary school. Through GET Waggle, students are improving their achievements by analyzing what they know and how they perform best when they learn and presenting advice, instructions, and hints suitable for each student.

3. Advantage and Usage of Business Simulation Learning

As for simulation, Mahboubian (2010) addressed many advantages have been explained which appears in various fields. Some of the major advantages are referred to in the following.

- The closer the simulation resembles a learner's actual environment, the greater the retention
- Simulations provide a safe environment in which to make mistakes
- Simulations allow learning to take place without pulling expensive equipment offline
- Creating the simulation can help to streamline the processes that are being taught
- Well-designed simulations often reduce the learning time significantly

Business Simulation can also be used in training and educating the specialists. In a wide research in year 2004 from a number of professors who use simulation softwares in their teachings, they were asked what targets they were aiming at by using such simulations. Table 1 indicates the details of this research (Faria & Wellington, 2004).

Table 2: Teaching objectives of business game

Objective	N	Percentage
To give students decision-making experience	162	48.8
To integrate theory with practice	120	36.1
To introduce students to planning	88	26.5
To have students experience teamwork	65	19.6
To have students engage in critical thinking	49	14.8
To measure comprehension and understanding	48	14.5
To have students experience business competition	31	9.3
To interest and motivate students	20	6.0
To have students experience uncertainty/pressure	14	4.2
To have students develop writing/communication skills	8	2.4
No objectives	7	2.1

Source: Mahboubian (2010), (p.5405)

4. Online Business Simulation: Capsim and Deep Practice

Capsim is a global company in developing and delivering business simulations that prepare participants to run profitable businesses. Capsim business simulations engage participants in a dynamic competition to turn struggling companies into successful, profitable businesses. Classes are divided into teams that work together to focus on strategy, finance, production, marketing, and all the key elements that interact to build their business. Instructors focus on directing the learning experience towards defined learning goals. With each round of decision-making representing a full year for the company participants build their business acumen and decision-making confidence as they interpret data, shape strategies, and experience the results.

A host of Capsim materials and services support the creation of a dynamic, highly interactive learning experience. Delivered online, in the classroom, or a combination of both, delivered in condensed or expanded time frames, Capsim programs have the flexibility to adapt to any academic or corporate curriculum. The Capsim formula for participant achievement, minimal preparation, and easy adaptability has proved successful at more than 500 business schools and leading corporations worldwide.
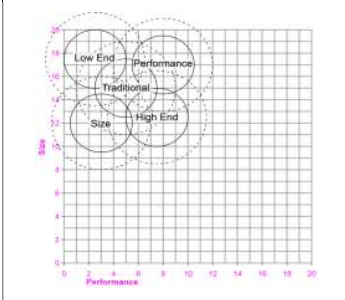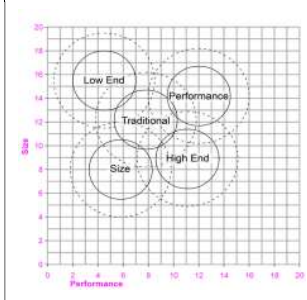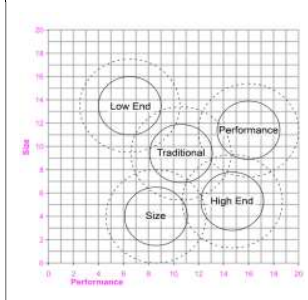
That's not to say genetics is always irrelevant – if you want to be a world-class basketball player, it helps to be tall but few occupations require specialized characteristics such as height. Most require a combination of skills that can be developed and honed through practice, and this is especially true for business acumen. Success is often embedded in environmental influences. For example, the presence or absence of a great coach or mentor matters significantly. The presence of a role model in the culture also influences success. The opportunity to develop a skill matters most of all. It can say like that "you can't become a pianist if there are no pianos".

After only 100 hours of deep practice, a person becomes noticeably better at a subject than others who haven't done that work. At 1000 hours, he or she becomes highly skilled in that subject, and it doesn't stop there. So 'talent' becomes somewhat predictable and measurable. There can say a person with 100 hours of deep practice is less competent than a person with 1,000 hours of deep practice. Viewed in this way, talent becomes a choice. The choice is to trade off the

time to develop one talent, for time spent on something else. The more time spent focused on a single talent, the less time can be given to others. Business acumen is a function of deep practice; talent has little to do with it.

Capsim simulations are designed to offer focused opportunities for deep practice. That's why they are often more effective than passive tools such as textbooks, videos, or lectures. By the way, 'deep practice' is very different from 'ordinary practice'. After commuters who drive to school or work can accumulate thousands of hours of driving, but that doesn't make them expert drivers. The key to deep practice is self-awareness. That is, paying attention to what you are doing well and not so well. This is so important to learn that scientists use a specific term for it: 'metacognition', or thinking about the way you think and learn.

Table 3: Overview of Capsim simulation

Contents	Explanation
Teams and Virtual Firms	• Participants form a team of three to four people. • Operating a virtual sensor manufacturer on the web – each team (company) starts with a base revenue of 100 billion won
Industry and company overview	• Each company produces and sells five types of sensor products - Low end, Traditional, Size, Performance, high end - The business of each product can be sold or introduced additionally. • The five types of sensors must be produced to meet the specifications required by each market
Each Round and Market	• All progressed to a total of eight rounds - One round is same as a year of the reality - Financial statements and industrial output report are presented the end of each round • The movement for each product markets as illustrated below in accordance with the customer's needs, the round has changed. <table><tr><td>Initial markets and product setting (based on customer needs)</td><td>Market by Product in Round 4</td><td>Market by Product in Round 8 (end)</td></tr></table> • Enterprises need to anticipate changing markets and customer needs and change their products and tactics accordingly (size, performance, reliability, price, etc.)

Decision Making and How to Proceed	• Overall, 5 to 6 business activities require decision making
	
	  - *R&D:* Performance, size, reliability, age
	  - *Marketing activities:* market demand, price, advertising, promotion, customer awareness
	  - *Production activities:* production conditions and capabilities, additional production costs
	  - *HR:* Wage level, overtime pay, training, wage negotiation
	  - *Finance:* Short-term liabilities, long-term financing, dividends, corporate credit management
	
	• Participants decide on how much to do each activity (e.g., how much wages will be raised in the following year, how much product performance will be increased, how much dividends will be paid, etc.) and enter it into each function sector.
	
	• When input is finalized and final stored, it is calculated globally to simulate competitive situations for each enterprise.

Results	• Results of each round simulation can be found in the final report
	  - Statement of financial position, income statement, and statement of cash flow are provided.
	  - Provide industry reports (market share and production status by company, etc.)
	
	• The results report provided identifies the share price, revenue, margin of profit, etc. of each competitor and establishes a strategy for the next Round.
	
	• Ranking by Competitors in a Comprehensive Balance Sheet

Deep practice has these characteristics:

- It is intentional. You are consciously seeking improvement as you practice.
- It is at the limits of your present capability.
- You fail. Often. If you didn't, you wouldn't be at the limits of your capability. You try again.
- You are seeking incremental improvement in each practice session, not breakthroughs.
- You are practicing the right things, not the wrong things. This often requires a coach.
- You have a feedback system in place, one that tells you when you are right and when you are wrong.
- You spend between half an hour and three hours a day in deep practice. If you spend more, you are getting diminishing returns. There is only so much you can accomplish in one day.

Simulations work because they are hands-on experiences that mimic the real world. Well-designed simulations present problems at the limits of participants capabilities, offer positive and negative feedback, have a coach, and work their brain in a way that builds your business skills. Throughout the training, participants can witness the incremental improvements in themselves over time. Here's an explanation to enable participant to use the Capsim simulation.

Table 4: Feature comparison between Capsim and Competitors

Feature	Capsim Simulation	Others
Onboarding Experience	Step-by-Step Tutorial; User Guide	Mostly Intensive Reading Materials
Flexibility and Adaptability	Individual; Tournament; Computer Team	Depends on Products

Add-ons & Modularity	Human Resource; TQM; Ethic; Labor Negotiations etc.	None
ADA Compliance	Capsim Core; Other Products in Process	None
LMS Integration	6 Major LMS	None
Collaboration Tool	In Game Chat Feature; Video Conference; Collaboration Mode	None
Student Support	Both Knowledge and Technical Support through Phone/ Email	Technical Support through Email
Professor Support	Registration Process, Class Planning and Setup and Customization through Phone/ Email	Technical Support through Email
User Interface	Modern Design; Easy to Navigate; Interactive Interface	Mostly Excel Spreadsheet Format
Accreditation Evaluation	Well Supported; Assurance of Learning	Less Supported

5. Conclusion

As an educational tool, business simulation games have grown considerably in use over the past decades and have moved from being a supplemental exercise in business courses to a central mode of business instruction. The business simulation game has been becoming a major form of pedagogy for use in business education (Faria, 2009). In particular, In particular, more people are looking for new education methods as they face the era of the fourth industrial revolution.

Business simulation games have evolved in many ways over the years. The utilization of computers for business games has also increased tremendously. The physical size and cost of computers are dramatically decreasing. All personal computers and portable devices have communication capabilities and access to information highways at the same time.

Education has long been considered one of the most essential foundations for boosting and expanding the economy in any country. In addition, investments in organizational training should reveal positive results, e.g., lack of facilities and improvement of allocated budgets, and university professors are forced to theoretically teach most of their students. This leads to students not actually familiar with or understanding concepts, which reduces the quality of education and leads to students' lack of success in employment. One of the advantages of business simulation is the opportunity to experience the business environment even if it is on the user's simulation base before entering the real business market.

The use of business simulation learning, such as Capsim, which is a given case, can create similar local systems by potentially engaging a large number of users in the virtual market. It could also be used as an individual to complete business training for students and those who are active in the business field of business.

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