

Chapter # 25

A STUDY OF THE EFFECT OF A COMPUTER ENVIRONMENT BUSINESS GAME

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ABSTRACT

In Japan, entrepreneurs are expected to have the ability to produce new business model ideas based on innovation and their capability as entrepreneurs. However, teaching methods in higher education institutions that offer Business management education programs have yet to be established. Business management education that motivates university students to be entrepreneurial and innovative is required for the development of society. A business management educational program is implemented in the School of Economics of a National University in Japan. In this program, a business game was implemented based on a business-game computer environment. The purpose of this study was to verify the effects of a computer environment business game by analyzing 24 student comments via e-mail after the experiment of business game running using a text mining analytics tool. Therefore, this chapter reviews the previous research on entrepreneurs and business-game-based education and the ability of entrepreneurs. Our analysis confirmed that a various virtual experiences of entrepreneurship could be provided by playing the business game. A regular business management education program conducted in the classroom cannot provide the virtual experience feature. The introduction of this business game into business management education serves to nurture entrepreneurship skill: Associating skill, Questioning skill, Observing skill, Networking skill, Experimenting skill. This chapter examined the educational effect of a business game on the perspective of entrepreneurship in order to clarify whether a business game would be effective for nurturing strategic entrepreneurs.

Keywords: entrepreneurship, innovator`s DNA, Business Management education, text mining analytics.

1. INTRODUCTION

The School of Economics of Wakayama University utilized a business game program provided by the School of Management of the Yokohama National University, called the bakery game, in a database management class. In this study, we examined the educational effect of a business game (e.g.: virtual experience) on the perspective of entrepreneurship (spirit of entrepreneurs and entrepreneurs' activity). Therefore, this study clarify whether a business game would be effective for nurturing entrepreneurs. A study of this chapter is based on an experimental case study by utilizing a business game in a class.

According to the small and medium-sized enterprises White Paper Japan (2014), changes in the economic and social structure of the region have emerged due to changes in the population and regional industrial structure. In 1986 circa, most of the region prefecture, except for those in Hokkaido, the central industry that was responsible for the

employment was the manufacturing industry. However, in 2012, the number of employees in the manufacturing industry decreased, and other industries (retail, service industry, health care and welfare) increased. Due to these changes related to different social structures in each region, diversification of industry of the region should be progressed to support the employment.

On the other hand, according to the small and medium-sized enterprises White Paper Japan (2014), decreases in the regional area population, especially in several municipalities in mountainous areas, the population significantly decreased. In order for small and medium-sized enterprises of the region that faced economic and social structure changes to develop sustainably, there is a need for new business development through the use of regional industry-specific production factors (regional management resources). Additionally, a variety of initiatives for regional activation of regional residents have been required to support the demand of the region to insure vitality in living. In recent years, the number of closed businesses continues to increase. In 2003, 16,255 companies were closed, which increased to 28,943 in 2013. The reasons for closures include the following: Aging and health problems of the management (48%), uncertainty of the business(12%), major trader or customer goes bankrupt including the case of transfer (7.8%), family problems within the management (nursing care, aging, education, etc.)(4.9%), avoidance of further deterioration of business management (4.4%), and a lack of successors (4.2%). In addition, the number of entrepreneurs, which was 292,000 in 2002, had declined to 223,000 people in 2012. The following reasons are included for the lack of entrepreneurs the low rates entrepreneurs in Japan.

1. Low level of entrepreneurial-oriented: "Insufficient education system", "Willingness stable employment", and "Lack of recognition of entrepreneurship as a career".

2. Instability of life and income after entrepreneurship: "Unstable life", "Lack of a safety net" and "Difficulty with re-employment".

3. Procedures and costs for entrepreneurship: "Entrepreneurial cost", "Complicated entrepreneurial procedures".

According to the IMD World Competitiveness Yearbook (2014), Japan was in 1st place of all 59 countries of the survey subjects until 1993. However, since then there has been a gradual decline with Japan being in 21st place as of 2014. This result shows that for Japan has not been considered a competitive international country at present time. This survey indicated a lack of entrepreneurship (55th place as of 2014) as one of the factors for the declining international competitiveness of Japan. The world evaluates Japan as lacking entrepreneurship. Porter (1990) indicated the entrepreneurship of Japanese companies as follows: A new generation of corporate managers is now taking the lead of the industrial world in Japan. In many cases, they are replaced with the former corporate founders and entrepreneurs that established their companies after World War II. In this process there exist risks that foresight and a good atmosphere for business establishment could be lost and that bureaucracy and conservatism could emerge. He also indicated the following issues for Japan.

- (1) Absence of corporate managers with entrepreneurship;
- (2) Organizational design where talented individuals cannot be utilized;
- (3) Rigid organizations;
- (4) Fragile system architecture;
- and (5) Inconsistency in the whole business strategy.

On the other hand, Kutsuna (2012) mentioned that the companies and corporate managers in Japan lack entrepreneurship and strategy thinking ability.

2. PREVIOUS RELATED RESEARCH

This section reviews the previous researches on entrepreneurs and business-game-based education and the disruptive innovation ability of entrepreneurs.

2.1. Previous Related Research on Entrepreneurs

This subsection reviews the previous researches on entrepreneurs. According to McClelland (1961), entrepreneurs are defined as "those who organized the company or business unit, enhancing its productivity." Brockhaus and Horwitz (1986) concludes that there is no comprehensive definition to Entrepreneur, which is common at present time. According to Matsuda (1998), the important experiences for successful training of entrepreneurs are as follows: 1. Experience in the community and in the home (the importance of understanding the society as a human), 3. Experience in education (the need for entrepreneurial education), 3. Workplace experience (a provision for the opportunity to gain experience through entrepreneurial practice) and, 4. Experience in incubator. According to Tanaka (2006), what is required in the era of change in terms of the Japanese companies and the Japanese economy is the realization of economic growth through innovation and entrepreneurship. Therefore, it is necessary to increase the individual's ability, and it is required to increase the "new challenger" in entrepreneurship. Conditions that generate the entrepreneurs of the local industrial regeneration, is considered as the image of the entrepreneurs in the community during a period of change. And, Tanaka (2006) mentions entrepreneurship is one choice when it comes to a job career. However, compared to other careers, there is considerable risk. Certainly, entrepreneurship puts ones entire life at risk, while an event that pulls the trigger is required. In addition, Tanaka (2006) mentions the road to entrepreneurs depends significantly on the personal qualities and the environment. Environments where entrepreneurs grow include space you are living in on a daily basis, for example a home, school, or a workplace. These spaces are the arena of interaction with a variety of people, such as parents, relatives, and friends. Many of the parents of entrepreneurs are business owners, self-employed, specialists, and administrative executives. Therefore, entrepreneurship can easily be fostered naturally within a family circle. In addition, they have the employee experience of small and medium-sized enterprises. The following factors are considered. Because of a concern over the future of the company, they aim to enhance their own capabilities while considering their career progression, They have a lot of direct opportunities to come into contact with company owners (existence of close role models), They can receive experience with a wide variety of occupations that might not be provided by large companies. According to Tada (2012), for local industrial regeneration, there are two forces "Export force" and "Circulation force" are significantly important. "Export force" is marketing ability. This is a force that exports products and services to other regions. "Export force" tries to sell products in large cities in order to attempt to obtain revenues from outside the region. "Circulation force" is an industry cluster. This force circulates revenues earned from outside the area in the region. It is important to circulate money earned from outside the region in the internal region. For regional economic autonomy, "Circulation force" is important.

2.2. Previous Related Research on Business-game-based Education

This subsection gives an overview of previous researches regarding business-game-based education. With respect to business-game-based education, Shirai (2005) indicated that students would be able to practice business knowledge including marketing, accounting, and logistics through a virtual experience of managing

companies on computers by participating in business games as players. By doing so, they would be able to deepen their understanding of corporate management. Additionally, the purpose of Shirai (2005) was that each individual student would analyze corporate systems through development of business game programs.

In order to develop a business game program, the developer needs to model the targeted business. Through this modeling process, students would be able to analyze corporate systems specifically by sorting out major targeted business factors and defining the relationships among these factors. Additionally, the developed business game program could be evaluated or criticized when other players played the program. This process would enable the developer to learn other factors that were unknown to the developer. Furthermore, when multiple students played the completed business-game program as players, the management results could be compared and analyzed. Doing so could analyze the availability of operations in the relevant business model. Fukuda (2006) formed a hypothesis that only students who finished their study of economics would be able to understand the business model of store management handled in a game, while students who could not understand the business model would be poor at playing the business game program. However, this hypothesis was not necessarily supported in his study. In other words, there was no correlation observed between the game performance of the students and their understanding level of economics. For this reason, he said that the current economics taught in Japan actually does not have any educational effect regarding the qualities that entrepreneurs should possess.

Hishiyama and Nakajima (2015) introduces one of our active learning programs, the Croquette Factory Game, for understanding business interaction with uncertainty. We show that this program provides beneficial educational effects for students in understanding a business model with uncertainty.

2.3. Previous Related Research on Disruptive Innovation Ability

In the following, it has been given an overview of previous researches regarding the ability of entrepreneurs.

A disruptive innovation is an innovation that creates a new market and new business resources and disrupts an existing market and business resources displacing established market leaders and alliances. With respect to disruptive innovation ability that is required for entrepreneurs, Christensen, Dyer, and Gregersen. (2011) indicated the importance of the following five skills: "Associating skill," "Questioning skill (to ask questions about objections to the actual conditions while being passionate to explore objects)," "Observing skill (to observe the surrounding world carefully in order to get insight or ideas that bring about new methods)," "Networking skill (to find out or attempt new ideas through a broad range of networks with others having diverse backgrounds and thoughts)," and "Experimenting skill (to challenge a new experience and attempt new ideas)." Figure 1 shows the model called "Innovator's DNA" in order for entrepreneurs to produce innovative ideas.

According to Gregersen (2009) of a six-year-long study into disruptive innovation involving some 3,500 executives, there are five skills that innovative and creative entrepreneurs need to develop. The five skills, Gregersen says, are 'a habit, a practice, a way of life' for innovators. Although Gregersen and his co-authors use the DNA metaphor, innovative entrepreneurs are actually made or developed, rather than born. "We each have unique, fixed physical DNA," says Gregersen, "but in terms of creativity, we each have a unique set of learnable skills that we rely on in order to get to the ideas that will give us some insight.

Since in this research, skills of Innovator's DNA are focused for confirming the Business Game educational effect. The next section verifies the effect of a business game by using the innovator's DNA model.

3. DISCUSSION

3.1. Bakery Game

The School of Economics of Wakayama University utilized a business game program provided by the School of Management of the Yokohama National University, called the bakery game, in a database management class. In this bakery game, teams with players acted as bakery managers that determine the sales price of bread, the number of orders of bread dough, and the amount of bread baked. Ten teams competed in the game based on their business performance based on the final amount of retained earnings. Each team competed with other teams in the common market with regard to their performance based on surplus funds or profit. The purpose of this game is as follows: (1) to experience the essence of corporate management, (2) to experience the decision-making process as a group, (3) to understand the profit and loss structure and utilize its concepts. In this study, we conducted this game by dividing the students into 10 teams with 4 to 5 members each. Afterwards, we had them submit written descriptions of their impressions about this game. In the end, 24 students submitted their descriptions by e-mail. Giving consideration for proper handling of personal information, we combined these written descriptions while hiding information that could identify an individual student and then conducted text mining.

3.2. Text-mining Technique

Text mining is the analysis of data contained in natural language text. The application of text mining techniques to solve business problems is called text analytics. Text mining can help an organization derive potentially valuable business insights from text-based content such as word documents, email and postings on social media streams. Mining unstructured data with natural language processing, statistical modeling and machine learning techniques can be challenging, however, because natural language text is often inconsistent. It contains ambiguities caused by inconsistent syntax and semantics, including slang, language specific to vertical industries and age groups, double entendres and sarcasm. Text analytics software can help by transposing words and phrases in unstructured data into numerical values which can then be linked with structured data in a database and analyzed with traditional data mining techniques. In this research, KH coder was used as Text analytics software. KH Coder is free software for content analysis, text mining or corpus linguistics. It can handle Japanese, English, French, German, Italian, Portuguese and Spanish language data. Just input raw texts and you can utilize searching and statistical analysis functionalities like KWIC, Collocation Statistics, Co-occurrence networks, Self-organizing map, Multidimensional scaling, Cluster analysis and Correspondence analysis.

3.3. Self-organizing Map

The self-organizing map in Figure 1 shows the results. This self-organizing map is a neural network algorithm not including teachers. This is a data analysis method that maps high-dimensional data on a 2D plane non-linearly. In Figure 1, the Innovator's DNA skills proposed by Christensen et al. (2011), Entrepreneurship and the Strategy thinking are mapped. In Figure 1 "Associating skill", is mapped on the cluster including "Thinking",

"Team" and "Analysis". "Questioning skill" is mapped on the cluster including "Insufficient" and "Opinion". "Observing skill" is mapped on both of the cluster including "Reflection the last time" and the cluster including "Sales" and "Number". "Networking skill" is mapped on the cluster including "Surroundings" and "Group". "Experimenting skill" is mapped on the cluster including "Understanding" and "Experience". "Entrepreneurship" is mapped on the cluster including "President", "Personal experience" and "Self-conduct". "Strategy Thinking" is mapped on the cluster including "Strategy", "Sense", "Essential" and "Look-ahead". Figure 1 shows us that this business game corresponds to the five skills of innovation DNA as a research result. Moreover, it demonstrates that the participants can find excitement in joining in corporate management and developing strategic reasoning.

Figure 1. The Self-Organizing Map of Business game Impressions.



Additionally, this result implicates that the participants can enjoy such an experience that differs from any of the education programs offered by the School of Economics.

4. CONCLUSION

In this research, we examined the educational effect of a business game on the perspective of entrepreneurship (spirit of entrepreneurs and entrepreneurs' activity) in order to clarify whether a business game would be effective for nurturing strategic entrepreneurs. As a theoretical framework, skills of Innovator's DNA are adopted for confirming the Business Game educational effect. And the text mining was conduct based on descriptions of their impressions about the business game. From the point of view of the five skills as

innovation DNA that Christensen et al. (2011) required of entrepreneurs, we were able to confirm that business game programs such as bakery game are actually essential for education of future entrepreneurs. Additionally, we also clarified that students would be able to experience virtual corporate management that cannot be explained in any subject offered in the School of Economics, while they could taste the enjoyment and a little difficulty related to business. The future issue of this study is to clarify the implementation methods of business game programs that can enhance the entrepreneurship progress effects in business games education. Half a century ago, Japan did produce a number of great entrepreneurs. They were the founders of Toyota, Sony and Honda who would be not afraid to try something different from existing for innovator's DNA skills. According to the education of business game playing, Japanese youths who would be unafraid to take risks of entrepreneurship. Business game education may be the best way to restart the Japanese economy rapidly.

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ACKNOWLEDGEMENTS

The present study was conducted with the cooperation of Professor Shirai of Yokohama National University Business School. We really appreciate his cooperation. And we appreciate students of Wakayama University Faculty of Economics who conducted the Business Game and described the impressions of comments.

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