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BUSINESS SIMULATIONS AS EFFECTIVE VIRTUAL AND EXPERIENTIAL LEARNING ENVIRONMENT

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Abstract

In this study, a digital simulation can be described as a programmable model providing an operational representation of reality where participants are required to make business decisions based on imitated phenomenon. Using a case example of a digital business simulation, this research explores business students' perception of the digital business simulations as an effective virtual learning environment. This study is based on quantitative research methodology and the data is collected through anonymous webropol survey. A total of 49 multinational students responded to the webropol survey with completed answers. Majority of the participants considered both 'Motivation to play' as well as 'Player's engagement' to have somewhat or considerable influence in an effective learning environment. 'Game's adaptability' was considered to influence somewhat or considerably to the effective learning environment by a majority of the respondents. Less than a third of the respondents considered the 'Graceful failure' to have considerable influence. This research also sheds light on the application of digital business simulations as an experiential learning environment. Two thirds of the respondents assessed 'Active experimentation' to affect considerably the experiential learning while playing the simulation game. Both 'Reflective observation' and 'Concrete experience' were assessed to have considerable affecting on the experiential learning by about less than half of the respondents. Only few did not consider the 'concrete experience' to have any affect, otherwise all factors were assessed to have at least a little effect on learning while playing a simulation game. Furthermore, research shows that respondents have assessed the digital business simulation as an effective experiential learning environment. The findings of this research propose insights related to the on-going research on the use of technology in the higher education.

Keywords: Business simulation, experiential learning, virtual learning environment, game-based learning.

1 INTRODUCTION

The prevailing ways of achieving student engagement are mostly driven by the marriage of new technologies with traditional teaching methods. One of such new-technology supported means is the use of business simulations as part of student learning in a wide variety of studies across several disciplines in the higher education institutes. Welbers et al. [1] highlight a need of more rigorous and systematic research to unveil the benefits of business simulations in the student learning process. However, a recent research [2] shows that learning outcomes from the use of digital business simulations produce mixed results. As such, the aim of this research is to explore students' perception of the digital business simulations as effective virtual learning environment. The study also sheds light on the application of digital business simulations as an experiential learning environment.

1.1 Digital business simulations

Extent literature provides various perspectives on the use of digital business simulations in the higher educational setting. For instance, Lohman and Pratt [2] examines the use of business simulations as an instructional strategy situated in social constructivist educational paradigm. Thus, connecting the phenomenon with earlier classical and seminal works. Nowadays, commercially available digital business simulations cover a wide range of business functional areas including manufacturing, supply chain management, marketing, entrepreneurship, accounting etc. Such business simulations potentially help and encourage students to be engaged in learning modes [3, 4] encapsulating many fundamental business processes. According to Martin and McEvoy [5], the important factor of hands-on feel of digital simulations is basically created to offer a real-world aspect, which is missing in the traditional old-school teaching modes including lectures and industry case studies. In this sense, the digital business

simulations develop among learners a concrete understanding of business operations, strategies and other business tactics.

The application and usage of digital business simulations continue to grow in the academia and industry alike [6] for past several decades. The main reason for such penetration is the ability of digital simulations to create suitable virtual environment for organizational learning [7, 8]. In the words of Bell and Loon [9], a digital simulation can be described as a programmable model providing an operational representation of reality where participants are required to make business decisions based on imitated phenomenon [10]. Due to these characteristics, digital business simulations have become quite popular in the higher education institutes especially within business and management related studies enabling teachers and trainers to easily bridge theory and practice. This explorative study is connected to the ongoing debate pertaining to the effectiveness of digital business simulations in the higher education institutes.

1.2 Virtual learning environment

This study avails four variables including (i) player's engagement, (ii) motivation to play, (iii) game's adaptability, and (iv) graceful failure to explore students' perception of digital business simulations as effective virtual learning environment. The argumentation revolving around these variables has been grounded in the extent literature and research [11] in simulation-based learning. Firstly, digital simulations, as virtual learning environment, offer a vast range of players' engagement in terms of learning objectives and decision-making as set within the design of particular simulations [12]. These types of engagements cover cognitive engagement in terms of mental processing; behavioural engagement in terms of gestures and movements; as well as socio-cultural engagement in terms of social interactions in cultural context [11]. Secondly, motivation of the learners to play the simulation game has been the most cited characteristic of digital simulation [13]. In the sense that such virtual learning environment motivates participants to remain engaged for a longer period of time or even through several stages of the game. The features including incentive structure and simulation mechanics are of motivational nature for the learners [11].

The engagement and motivation of the players are further facilitated by game's adaptability. According to Andersen [14], customization or personalization by the player are main features within virtual simulation adaptability. Such adaptability creates a personal connection between the virtually created environment and player's own specific individual situation in terms of current state of knowledge, cognitive abilities, and player's own emotions [11]. Azevedo et al. [15] argue that these aspects also involve modifications to complexity and type of problems that players face while being part of virtual learning environment. Lastly, digital simulations offer the participants an opportunity of graceful failure rather than an undesirable outcome. Kapur and Bielaczyc [16] highlight that failure is sometimes a necessary phase in the learning process of the students of higher education institutes. Participants in the virtual learning environment face several challenges including trying new things, exploring new ideas and above all risk-taking [17]. These dimensions allow participants to implement innovative strategies and find out-of-the-box solutions to secure intended results [18].

This study further connects digital business simulations with experiential learning environment by exploring the variables including (i) concrete experience, (ii) reflective observation, and (iii) active experimentation as proposed by Kolb's (1984) Experiential Learning Cycle [19]. In this framework, concrete experience is related to doing, thus declares a learner as an active participant; reflective observation is related to observing where a learner consciously reflexes on experience and active experimentation deals with the planning aspect where a learner tries to foresee and plan forthcoming experience [20]. These variables take place in iterative cycle of stages leading to further refinement of a learner's understanding [21].

The rest of the paper is structured as follows. In the next section, the context of the study and the research design are described as part of methodology. The results of the empirical analysis are presented. Then the conclusion of the study is presented. Research limitations are provided with recommendations for the possible future directions at the end of the paper.

2 METHODOLOGY

A description of the context of the study and research design are provided as under:

2.1 Context of the study

This research explores students' perception of the digital business simulations as an effective virtual learning environment. The study also sheds light on the application of digital business simulations as an experiential learning environment. The context of this research is a 5-credit course offered to multinational business students belonging to 3rd year of their degree program. This particular course is developed around a digital business simulation. Business students, while working in their respective teams, actively participate in playing the digital simulation game. A leading Finnish education technology company, who is designing and marketing business simulation games for higher education institutes and corporations, provides this digital business simulation. Such digital games are seen efficient educational tools that help putting theory into practice, supporting students' engagement, enhancing knowledge retention, and developing soft skills.

During the implementation of the course, students play this digital business simulation in teams. For instance, in one course, there are around 5 to 7 teams playing the game. Each team consists of 3 to 5 students. Each team plays eight rounds of the simulation game. While playing the game, each team competes with other teams rather than competing against the simulation game itself. The game is developed around an automobile manufacturing industry that manufacturers vehicles with various technologies and having numerous features. These vehicles are sold primarily to three global regions including the USA, Europe and China. In order to achieve a profitable business outcome, team members collaborate with each other while making strategic decisions.

2.2 Research design of the study

The primary data for this study is collected from 49 multinational business students belonging to three different implementations of the same course. This study follows a quantitative research design that utilizes empirical data collected during the spring and autumn semesters of year 2021. A questionnaire was developed pertaining to the virtual learning environment and experiential learning environment. The variables were based on the literature review. Authors carefully reviewed the questionnaire.

Four variables related to the virtual learning environment were included in the questionnaire. These variables are (1) player's engagement, (2) motivation to play, (3) game's adaptability, and (4) graceful failure. Similarly, three variable including (1) active experimentation, (2) reflective observation, and (3) concrete experience were included in the questionnaire that influence the experiential learning environment. The respondents were asked to rank the importance of four factors influencing in making virtual simulations as an effective learning environment in a scale from 'not at all' to 'considerably'. This research also incorporates the participating student profile data.

The analysis also takes into consideration these student profiles including the 'age', 'gender', and 'nationality' of the respondents. Furthermore, the respondents were asked to analyze to what extent do these factors affect experiential learning in a simulation game. For the analysis, the rankings were modified into percentages from 'not at all' (0%) to 'considerably' (100%).

The researchers analyzed the data with the help of SPSS and MS Excel software. The empirical data was entered into IBM SPSS statistical tool for the analysis. Both of the main concepts and relevant variables help analyze business students' perception of these constructs. The analysis sheds light on significant aspects of students' perception of virtual learning environment and experiential learning environment.

The students were informed about the voluntary nature of their participation and the confidentiality of their responses. The results of the empirical analysis is provided in the next section.

3 RESULTS

Total of 49 responses were received and included in the empirical analysis. The respondents in the data sample represent thirteen different nationalities. Finnish, French and German respondents were the most common nationalities. The other nationalities are e.g. Mexican, Pakistani, Italian and Russian. (Table 1.)

Table 1. The respondents' nationalities

	Frequency	Percent
Finnish	19	38,8 %
French	10	20,4 %
German	8	16,3 %
Other	12	24,5 %
Total	49	100,0 %

Somewhat over half of the respondents (57 %) are females and 40 % are males. One respondent preferred not to reveal their gender. Half of the respondents are 21-25-year-old and about a third are 26 years or older. One fifth belong to age category 17-20-year-old. (Table 2.)

Table 2. The respondents' age distribution

	Frequency	Percent
17 - 20 years	10	20,4 %
21 - 25 years	24	49,0 %
26 year or older	15	30,6 %
Total	49	100,0 %

A third of the respondents have prior experience of simulation games, however, majority (63 %) have not previously played simulation games.

The respondents were asked to assess to what extent do the following four factors influence in making simulations an effective learning environment. The factors assessed were 'Motivation to play', 'Player's engagement', 'Game's adaptability' and 'Graceful failure'. The assessment was done on scale 'Not at all' (1), 'Only a little' (2), 'Somewhat' (3) and 'Considerably' (4).

Over 95 % of the respondents considered both 'Motivation to play' as well as 'Player's engagement' to have somewhat or considerable influence in an effective learning environment. Only one respondent considered that motivation to play did not influence the effectiveness of learning environment. (Fig 1.)

The 'Game's adaptability' was considered to influence somewhat or considerably to the effective learning environment by a majority of 90 % of the respondents. A least number of the respondents agreed with the influence of 'Graceful failure'. Less than a third of the respondents considered the 'Graceful failure' to have considerable influence. (Figure 1.)

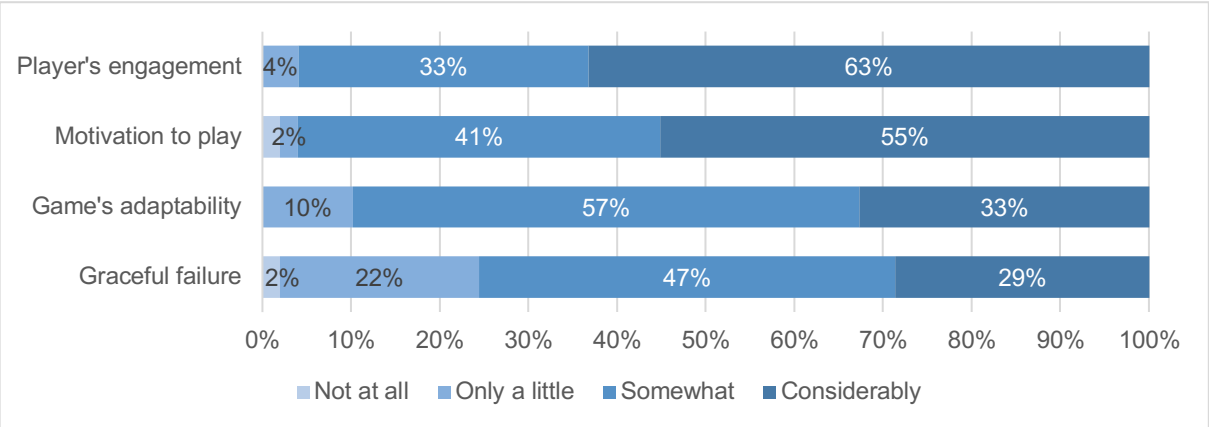

Figure 1. The factors influence in making simulations an effective learning environment

The respondents were asked to assess to what extent do the following three factors affect learning while playing a simulation game. The factors assessed are 'Active experimentation', 'Reflective observation', and 'Concrete experience'. The assessment was done on scale 'Not at all' (1), 'Only a little' (2), 'Somewhat' (3) and 'Considerably' (4).

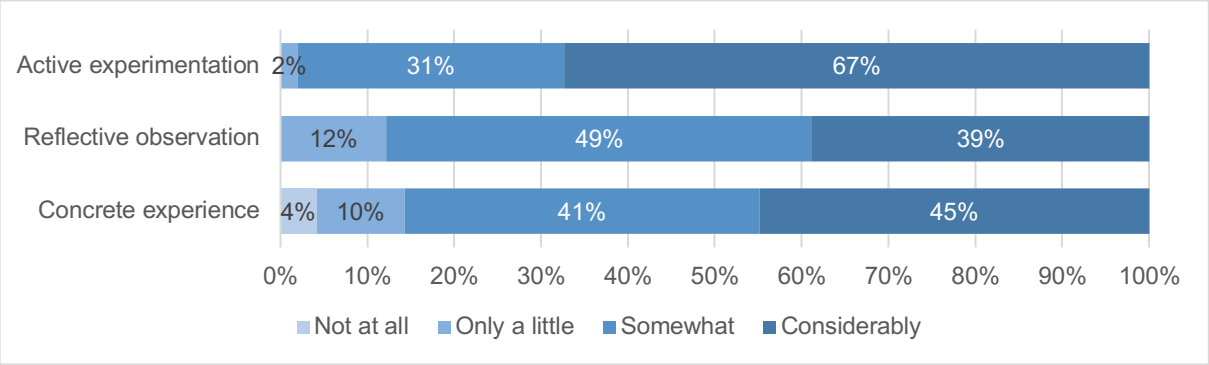

Figure 2. The factors affecting experiential learning in a simulation game

Two thirds of the respondents assessed 'Active experimentation' to affect considerably the experiential learning while playing the simulation game. Both 'Reflective observation' and 'Concrete experience' were assessed to have considerable effect on the experiential learning by about 40 % of the respondents. Only 4 % did not consider the 'concrete experience' to have any affect, otherwise all factors were assessed to have at least a little effect on learning while playing a simulation game. (Figure 2.)

Overall, the respondents have assessed the simulation games as an effective experiential learning environment. The conclusion of the study is presented in the next section.

4 CONCLUSIONS

Using a case example of a digital business simulation, this research explores business students' perception of the digital business simulations as an effective virtual learning environment. In this study, a digital simulation is described as a programmable model providing an operational representation of reality where participants are required to make business decisions based on imitated phenomenon. The results of the empirical analysis are discussed which shed light on students' perception of factors influencing in making digital business simulations an effective learning environment in terms of (1) player's engagement, (2) motivation to play, (3) game's adaptability, and (4) graceful failure. Majority of the participants considered both 'Motivation to play' as well as 'Player's engagement' to have somewhat or considerable influence in an effective learning environment. Only one respondent considered that 'Motivation to play' did not influence in the effectiveness of the learning environment. Furthermore, 'Game's adaptability' was considered to influence somewhat or considerably to the effective learning environment by a majority of the respondents. Less than a third of the respondents considered the 'Graceful failure' to have considerable influence.

This research also sheds light on the application of digital business simulations as an experiential learning environment. Three variable including (1) active experimentation, (2) reflective observation, and (3) concrete experience were analyzed that influence the experiential learning environment. Two thirds of the respondents assessed 'Active experimentation' to affect considerably the experiential learning while playing the simulation game. Both 'Reflective observation' and 'Concrete experience' were assessed to have considerable affecting on the experiential learning by about less than half of the respondents. Only few did not consider the 'concrete experience' to have any affect, otherwise all factors were assessed to have at least a little effect on learning while playing a simulation game. Furthermore, research shows that respondents have assessed the digital business simulation as an effective experiential learning environment. This research sheds light on significant aspects of students' perception of the digital business simulations as effective virtual learning environment and an experiential learning environment. This research is directly connected with the ongoing debates around new technology-supported pedagogical methods in business studies. This explorative study contributes in providing insights into the digital simulation-based learning method and experiential learning in the higher education.

This study uses a smaller data sample for empirical analysis. It is considered as a research limitation, thus it is suggested that care should be taken in generalizing the finding of this research. It is recommended that a larger empirical sample should be used to further explore the two concepts from business students' perspective. As a potential future direction of the research, we suggest a comparative research study could be conducted using a larger empirical sample.

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