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Factors Affecting The Reduction Of Gap Between Academic Learning And Corporate Requirements Through Simulation Games: A Study On Management Students Of Delhi Ncr Region

Jayati Ranga[1] and Dr. Shabnam Siddiqui[2]

[1] *Research Scholar, Banasthali Vidyapith, e-mail id: jayati.paatlan@gmail.com*

[1] *Associate Professor, Banasthali Vidyapith, e-mail id: shabnammba@rediffmail.com*

Abstract

Education is the key tool of social transformation. It empowers the individuals to learn, gain knowledge and grow. The National Education Policy of India underlines Outcome-Based Education (OBE). The employability of graduates has remained a major concern for developing economies like India. There exists skill gap between quality and skills provided and expected by industry. The widening gap leads to unemployment. This article aims to identify the factors influencing the gap between the academic learning and corporate requirements towards developing effective management professionals through simulation games/ game-based learning. The study utilized factor analysis was used to calculate the variance; Kaiser-Meyer-Olkin test was used to calculate the adequacy of the factors and Bartlett's Test was used to calculate the adequacy of samples. The study indicate that besides team building capabilities the students are clear about developing fast decision-making skills as well as leadership qualities when it comes to their expectation from the management students. The study was conducted on the management students of both graduate and post- graduate students of NCR; hence the study can be extended to other field of study. The study will be able to help the learners to better comprehend the application of management theories in the practical front. Hence, to make learning experience better, more playful and making better understanding of the concepts.

Keywords: Outcome-Based Education, Corporate Training, National Policy of Education (NPE), Simulation Games, Management Education.

1. Introduction

Education is the key tool of social transformation. It empowers the individuals to learn, gain knowledge and grow. The National Education Policy of India underlines Outcome-Based Education (OBE). The employability of graduates has remained a major concern for developing economies like India. There exists skill gap between quality and skills provided and expected by industry. The widening gap leads to unemployment. This article aims to identify the factors influencing the gap between the academic learning and corporate requirements towards developing effective management professionals through simulation games/ game-based learning. The corporate trainings are conducted for the better grasping of the managerial skills and learning to utilize them and practice them in day to day functioning of the organization. The gap was being always observed in the education that is imparted to students at graduation and post-graduation level and the required skills at the corporate level. Trainings are being conducted so

as to make employees equipped with the requirements of the market. Wherein, it has been believed that business games encourage students to outperform in a complex and competitive environment where cross-functional thinking is promoted which is not achieved by any other method (Brennan, Willetts, & Von, 2005).

2. Significance of Study:

It has been observed that technology has benefited learning motivating the educators to use new and interesting instructional methods to ensure active student engagement by making learning a proper mix of fun, interesting as well as challenging; (Dhamija & Dhamija, 2020). This can be accomplished by presenting the course content as a game, as playing a game gives learners a sense of purpose and success. Game-based Learning (GBL) is a style of teaching technique that has sparked the academic community's interest in recent years (Deterding, Dixon, Khaled, & Nacke, 2011). Several definitions of game-based learning have been proposed in the literature, with scholars providing definitions in a variety of scenarios. It is defined as an instruction-based system that focuses on quantifiable procedures and outcomes (Pho & Dinscore, 2015) (Fatta, Maksom, & Zakaria, 2019). Researchers have also developed the concept of "digital game-based learning," which combines games with technology and software (Lengyel, 2020) (Talib, Aliyu, Malik, & Siang, 2019). To put it simply, game-based learning is a creative instructional style or pedagogy used by educators in which highly engaging games are designed for learners using digital technology and software.

Becker and Watts (1995) stated that incorporation of games and simulation exercises in education has given an opportunity to students to apply the concepts that are being learned during the theoretical classes. Simulation based learning's are enhanced by the instructors whose debriefing activity of the critical areas foster further consequences in relation to choices made by the participants (Hallinger & Wang, 2020). In the corporate trainings, games have proved to be an immense powerful tool in the learning process. Decision making ability, motivation, accepting challenge in both professional and personal life has been some of the learning's which were effectively imbibed by the participants. Simulations are not only confined to the classroom training but also marked effective for the industrial training (Hameed & Mathur, 2020). The previous study in the area does not suggest specific factors that lead to reduction in the gap between the academic learning and corporate requirements. The purpose of the study is to explore the various factors will help in bridging the gap between the actual and industry expectation through game based learning. The next section of the study discusses the literature review followed by research methodology and analysis of the data collected.

3. Literature Review

Gaming has significantly contributed to the student education by accepting the experience and utilizing the feedback in the 'on-going' dynamic environment (Longworth, 1969). Kolb (1984) states that to be successful in experiential learning one should deeply get involved in the exercises with unbiased approach towards all the new experiences, learning to develop concept by integrating all the observations into a systematic and logical theories, and an individual must use this learning's in the real-life decisions and problem solving. In 1987, Ladousse defined "Role" as evaluating the situation and "Play" is being associated with a relatively safer environment which encourages creativity (Chan, 2011).

Goldstein in 1991, claimed that to excel in both classroom and workplace, systematic acquisition of skills, knowledge, concepts and attitudes are also developed through the Role Play (Chan, 2011). In 1992, Richardson and Kleiner explained through the role play activity that the increase in the student involvement in the topic eventually leads to retention of concepts and hence imbibing the skills learnt from the game. Hamer (2000) and Maddrell (1994) stated that experiential learning approach like role play is administered as an effective educational tool that can bridge the gap between the academic learning's with the practical applicability of learned knowledge.

Brotherton (1999) said that biggest concern which gave importance to games are management of human resource, leadership, team building, building communication skills and decision-making ability. Approaches like management games are contributing more towards the deeper learning by enhancing student's interest, motivation, participation, knowledge and skill enhancement (Ruhanen, 2005). Papamarcos (2002) discussed that learning from experiences have their own educational benefits; the practical insight for career development is developed through the creative, analytical and critical thinking which can be developed using the experiential learning approach and also improved interpersonal skills and self- confidence. Vogotsky, in his studies stated that role play is an effective way to build social interaction among the team members and also to create a safer environment where the expression of values can be done (Alkin and Christie, 2002) and teacher can correct and modify the areas if required (Chang, 2010). Lainema and Lainema (2007) considered management games as an irreplaceable tool to acquire advancing knowledge about the know-how of a business (Kabeil, 2009). In 2017, Scott and Pete conducted the survey and approximately ninety-seven percent of his participants showed positive response towards the life skills learned through experiential learning (Wurdinger & Allison, 2017).

Simulation training exposes the learners to various situations which creates practice opportunity for the learners to observe the situational impact of the actions, hence adoption of improved innovative knowledge (Lysebetten, Anseel, & Sanchez, 2020). Simulation games are considered to be both teaching and assessment tool for improving the skills like professionalism, communication, teamwork and time management and many more (Elshama, 2020). Game based learning has also been proved to be appositive indicator not only in the improvement in the scores but also in the enthusiastic participation of the learners was also observed (Gudadappanavar, Benni, & Javali, 2021). Game based learning has positive impact on the learning process of undergraduate education, wherein conceptualization of challenges in the game flow model has optimized the social learning and performance monitoring (Chan, Wan, & King, 2021).

Vásquez, Peñafiel, Cevallos, Zaldumbide, & Vásquez (2017) used a game-based learning approach to help students improve their social and management skills. The concept was implemented as two games: Recursion and Simulation, the first of which was based on a programming course and the second of which was aimed at enhancing the learners' marketing management skills. The children benefited from the outcomes, and they developed teamwork and collaboration skills. Ding, Guan , & Yu (2017) explored the utility of game-based learning as an instructional strategy for higher education using a survey-based approach for finance students in another study. They built an online stock trading game and compared the results to traditional methods of learning. The results showed that the pupils responded better to the game-based method. The results showed that the pupils responded better to the game-based method. Stansbury & Earnest, (2017) employed gamification to construct and objectively analyse an industrial organisational psychology course that contained components of role play, narrative, and social interaction, and they used GBL to do it. Students were divided into experimental and control groups for the experiment, with the experimental group having higher levels of motivation, engagement, and enjoyment.

Chang & Hwang (2019) investigated the key countries that use game-based learning, as well as the major types of games and learning techniques used. According to the preceding findings, game-based learning has gained in popularity in recent years and is now being adopted as the preferred pedagogical tool in higher education by teachers.

4. Problem Statement:

Based on the above literature review it can be said that that there are lack of studies that can enlist important factors that simulation games should have that can lead to development of effective management professionals. This leads to the following research questions:

1. What are the factors that that simulation games should have that can lead to development of effective management professionals?
2. What is the extent to which each factor are affecting the effectiveness of these simulation games?

The next section discusses the research method as well as the statistical analysis of the data collected.

5. Research Method

The study entailed the management games that were best fit for the learning and imbibing of the required managerial skills. Profiling helped in the tabulation of the desired skills and the respective games used to make learning an effective experience for the learner. Both Primary as well as secondary data was used to draw conclusions from the study as they both in totality acts as building block for the research. Primary data was collected from the under graduate and post graduate students of management program. For descriptive research collection of data was done through surveys and then the obtained primary data through questionnaires, interview method, through schedules etc.

- **Measurement**

A structured questionnaire was prepared for the present research work. Each item was measured on 5 point Likert scale where 1 represented 'Strongly Disagree' and 5 represented 'Strongly Agree'. Measurement items for the questionnaire were taken from Tal Ben-Zvi (2010) and Kim (2015). To pre-test the instrument, the questionnaire was pilot tested with a sample of 30 subjects during January, 2021. The respondents of the pilot testing were undergraduate and post graduate students of management school who are studying in Colleges of Delhi NCR, who were not included in the main survey. The results of pilot testing confirmed that the scales were reliable and valid. In order to avoid skewing of the results, the data from the pilot test were not used in the final phase of data collection. First the students were briefed on the meaning and objective of the testing. Then the questionnaire was administered to all the students and then after they filled the survey then a simulation game was played in the class. Then again the survey form was administered.

The objective of the study was to create effective games for bridging the gap between the academic learning and corporate requirements. The literature suggests several factors that are important to achieve after playing the simulation games that will reduce the gap between the theoretical learning and industry requirements. The following section discusses the various constructs/ parameters of the study i.e. the various that the simulation games should take care towards developing effective management professionals. On the basis of literature review the following six constructs have been finalized for the study and the respective items have been listed in the table 1:

1 Motivation
2 Team Building spirit
3 Fast Decision Making
4 Leadership qualities
5 Risk management Capabilities
6 Taking challenges

Table 1: Factor Influencing the Gap

Motivation	
Sr. No.	Question
M1	I feel motivated after playing simulation games
M2	I feel increase in motivational level after playing simulation games
M3	I can surely say that playing motivational games led to increase in my motivational level
M4	There is no doubt about increase in the motivational level on playing simulation game.
M5	Rise in my motivational level after playing simulation is undoubted

Team Building spirit	
Sr. No.	Question
TB1	I feel improvement in my team building spirit after playing simulation games
TB2	I feel increase in team building spirit after playing simulation games
TB3	I can surely say that playing motivational games led to increase in my team building spirit level
TB4	Rise in my team building spirit level after playing simulation is undoubted
TB5	There is no doubt about increase in the team building spirit level on playing simulation game.
Fast Decision Making	
Sr. No.	Question
FDM1	I feel my decision making capacity fastened after playing simulation games
FDM2	I feel improvement in my quick decision making level after playing simulation games
FDM3	I can surely say that playing simulation games led to increase in my fast decision making capacity
FDM4	There is no doubt about improvement in the decision making capacity after playing simulation game.
FDM5	Rise in my decision making capacity after playing simulation is undoubted
Leadership qualities	
Sr. No.	Question
LQ1	I feel my leadership qualities improved after playing simulation games
LQ2	I feel increase in Leadership qualities levels after playing simulation games
LQ3	I can surely say that playing simulation games led to increase in level of my leadership level qualities
LQ4	Rise in my leadership level after playing simulation is undoubted
LQ5	There is no doubt about increase in leadership skill level on playing simulation game.
Risk management Capabilities	
Sr. No.	Question
RMC1	I feel improvement in my risk management capabilities after playing simulation games
RMC2	I feel increase in risk management capabilities level after playing simulation games

RMC3	I can surely say that playing motivational games led to increase in my risk management capabilities level
RMC4	There is no doubt about improvement in the risk management capabilities after playing simulation game.
RMC5	Rise in my risk management capabilities after playing simulation is undoubted
Taking challenges	
Sr. No.	Question
TC1	I like playing the simulation game because it's a challenge
TC2	I like to learn as much as I can from the simulation game.
TC3	I like complex simulation games because I enjoy trying to figure them out
TC4	I play the simulation game because I am interested in the subject
TC5	If I get stuck in the simulation game, I keep trying to figure out the problem on my own.

6. Data Analysis

The questionnaire designed in the structured form was completed, and the collected data was entered into an excel spreadsheet. A reduction technique known as factor analysis was used after proper data cleaning. As a result, the factors were classified into six groups. The factor's results, such as KMO test, the Barlett's test, the rotated matrix, and so on, are listed below.

Table 2: **Table showing KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.799
Bartlett's Test of Sphericity	Approx. Chi-Square	27664.794
	df	699
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) Test determines how well your data is suited for Factor Analysis. The test determines sampling adequacy for each variable in the model as well as for the entire model. The statistic is a measure of the proportion of variance that may be common variance among variables. The lower the proportion, the better your data is suited for Factor Analysis. KMO returns values ranging from 0 to 1. A good rule of thumb for interpreting the statistic is that KMO values between 0.8 and 1 indicate adequate sampling. KMO values less than 0.6 indicate that the sampling is insufficient and that corrective action should be taken. Some authors put this value at 0.5, so use your own judgment for values between 0.5 and 0.6

Normally, 0 < KMO < 1 If KMO > 0.5, the sample is deemed adequate. KMO = 0.799 in this case, indicating that the sample is adequate and that we can proceed with the Factor Analysis. Sphericity Test by Bartlett Using a 95% confidence level of significance, = 0.05 The Factor Analysis is valid because the p-value (Sig.) is.000 0.05. As p, we reject the null hypothesis H0 and accept the alternate hypothesis (H1) of statistically significant interrelationship between variables. To assess the appropriateness of Factor Analysis, the Kaiser-Meyer Olkin (KMO) and Bartlett's Test measures of sampling adequacy were used. The approximate Chi-square value is 27314.794 with 903 degrees of freedom, which is significant at the 0.05 level of significance. The KMO statistic of 0.799 is also

significant (greater than 0.50). As a result, factor analysis is regarded as an appropriate technique for further data analysis. Eigen values (Select components with Eigen Values greater than 1). The initial components are the variable numbers used in the Factor Analysis. However, not all of the six variables will be kept. In this study, only four factors will be extracted by combining the relevant variables. The variances of the factors are represented by the Eigen values. The Eigenvalue can be found in the total column. Because the first factor always accounts for the most variance, it has the highest Eigen values. The following factor will account for as much of the remaining variance as possible, and so on until the final factor is found. The communality values from the factor analysis are shown in Table 3:

Table 3: Communalities
Extraction Method: Principal Component Analysis

Factors	Initial	Extraction
M1	1.000	.667
M2	1.000	.480
M3	1.000	.769
M4	1.000	.670
M5	1.000	.645
TB1	1.000	.701
TB2	1.000	.521
TB3	1.000	.636
TB4	1.000	.509
TB5	1.000	.726
FDM1	1.000	.623
FDM2	1.000	.840
FDM3	1.000	.683
FDM4	1.000	.646
FDM5	1.000	.796
LQ1	1.000	.667
LQ2	1.000	.622
LQ3	1.000	.721
LQ4	1.000	.568
LQ5	1.000	.570
RMC1	1.000	.575
RMC2	1.000	.724
RMC3	1.000	.768
RMC4	1.000	.695
RMC5	1.000	.766
TC1	1.000	.812
TC2	1.000	.593
TC3	1.000	.812
TC4	1.000	.672
TC5	1.000	.763

The following table 4 shows the Total Variance Explained by the factor analysis. The factors are able to explain about 68 per cent of the variance, which is a reasonably acceptable response.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.054	35.009	35.009	15.054	35.009	35.009	7.765	18.058	18.058
2	4.202	9.771	44.780	4.202	9.771	44.780	5.458	12.693	30.750
3	3.308	7.693	52.473	3.308	7.693	52.473	5.058	11.763	42.513
4	2.551	5.931	58.404	2.551	5.931	58.404	4.230	9.838	52.351
5	1.954	4.545	62.950	1.954	4.545	62.950	3.998	9.297	61.648
6	1.913	4.449	67.399	1.913	4.449	67.399	2.473	5.751	67.399
7	1.621	3.769	71.168						
8	1.416	3.294	74.462						
9	1.200	2.791	77.253						
10	1.085	2.524	79.777						
11	.920	2.139	81.916						
12	.824	1.917	83.833						
13	.728	1.693	85.526						
14	.698	1.623	87.149						
15	.606	1.409	88.559						
16	.568	1.321	89.879						
17	.534	1.243	91.122						
18	.519	1.207	92.329						
19	.451	1.048	93.377						
20	.396	.922	94.299						
21	.367	.853	95.152						
22	.319	.741	95.894						
23	.274	.638	96.531						
24	.232	.539	97.070						
25	.187	.434	97.504						
26	.176	.409	97.913						
27	.138	.322	98.235						
28	.126	.292	98.527						
29	.106	.247	98.774						
30	.094	.218	98.991						
31	.086	.199	99.191						
32	.079	.183	99.374						
33	.066	.153	99.527						
34	.049	.114	99.641						

The factor analysis component matrix is shown in the table below, i.e. Table no. 5. The extraction method used is Principal Component Analysis. This method drew factors from a variety of sources. Table 5 displays the Rotated Component Matrix results. For extraction, Principal Component Analysis was used. Varimax with Kaizen normalise is the rotation method used. The rotation converged after 11 rotations. The rotated component uncovered four major factors, which are discussed further below:

Table 5: Results of Principal Component Analysis

	Component			
	1	2	3	
M1	.847			
M2	.629			
M3	.627			
RMC2	.644			
M5	.628			
TC1	.648			
TC2	.557			
TC3	.644			
RMC1	.619			
M4	.743			
TC5	.433			
RMC4	.622			
RMC5	.617			
TC4				
RMC3				
TB3		.822		
TB2		.733		
TB1		.647		
TB4		.658		
TB5		.514		
FDM1			.832	
FDM5			.718	
FDM3			.744	
FDM4			.668	
FDM2			.625	
LQ1				0.654
LQ2				.0642
LQ3				.694
LQ4				.641
LQ5				.732

The data reduction technique revealed four significant factors. The first and most important factor is as follows:

1. Strong challenge management skills
2. Team building capabilities
3. Fast decision making skills
4. Leadership qualities

The results of the exploratory analysis helped in assimilation of the four important factors. These factors were further tested with regression analysis to understand the relationship with satisfaction of the residents as a dependent variable.

Table 5: Results of regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Level of Significance
1	.826[a]	.7452	.743	.2185	0.01
a. Predictors: (Constant), F4, F3, F2, F1					

Table 5a: Results of regression Analysis with Coefficients

	Coef.	**Standard error**	**P-value**
Intercept	32.547	0.2645	0.1310
Strong challenge management skills	0.751	0.2326	0.001
Team building capabilities	0.439	0.2170	0.0014
Fast decision making skills	0.165	0.3222	0.0011
Leadership qualities	0.057	0.1347	0.0012

The results of the regression analysis are given below. It can be seen that the adjusted R^2 value is 74.3 percent which shows good explanatory power of the model. The Strong challenge management skills contributed maximum to the estimation followed by Team building capabilities. Fast decision-making skills Leadership qualities are the third and fourth most important factor with beta value of 0.054.The further section discusses the results and conclusion of the study.

7. Discussion

The objective of the study was to create effective games for bridging the gap between the academic learning and corporate requirements. The input variables of factor analysis were Motivation, Team Building spirit, Fast Decision Making, Leadership qualities, risk management Capabilities, Taking challenges. The factor reduction technique gave the following factors as output factors. These factors are strong challenge management skills, Team building capabilities, fast decision-making skills, and Leadership qualities. Again, the most important aspect of the research was to find out the gap between academic learning and corporate requirements and how this gap can be bridged through simulation games. The study results indicate that besides team building capabilities the students are clear about developing fast decision-making skills as well as leadership qualities when it comes to their expectation from the management students. This means that students feel that they do have conceptual as well as practical understanding of how to work in the industry but there is a grave lacking of people skills or how to derive people in the organization. They also feel that they can take decision in normal circumstances but seriously lack quick decision making at the time of contingencies. Therefore again a very important recommendations from the study for the serious/ simulation games developers that they should inculcate the characteristics of fast decision making skills as well as Leadership qualities along with team building spirits. The researcher further compared the results of the present study with the results of previously conducted studies in the same area. Some of the studies regarding serious games verified that serious games can give a meaningful and relevant context for learners to better comprehend the subject matter and do it in a more efficient and convenient manner (Van Eck, 2006). Another study claimed that learners can use games to better comprehend the connections between subject matter material, procedure, and context (Klabbers, 2003).

8. Conclusion

This work makes significant theoretical advances to the fields of game-based learning and game

motivation research in general and in particular. First, this research proposes a new way to look at the game-based learning process. Several attempts have been made to uncover the mechanisms that determine how learners' performance and learning outcomes are determined in the game-based learning process. This study adds to our understanding of the parts of the game- based learning process by highlighting the factors that influence perceived seriousness. Seriousness, as Wilson (1998) points out, is an important aspect of education that has been overlooked. This was also true in game-based learning studies. Even though serious games, such as instructional games, clearly have important elements in their design, they are sometimes overlooked in favor of the fun aspect. This study would serve as an initial warning to the area about the problem and provide an opportunity for the area to become more research-rich. Furthermore, this research adds to the body of knowledge on theories relating to how business professionals make sense of new business tools. In the various topics about business simulation games, this study will enlighten practitioners who seek a successful implementation of business simulation games.

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