

ROLE OF GAME-BASED TEACHING IN LEADERSHIP SKILLS DEVELOPMENT

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ABSTRACT

Research related to Game-Based Teaching (GBT) has intensified recently with the increase in the technological advancement of teaching methodologies. The adoption of GBT leads to several benefits for improved learning and skills development. However, there have been few researchers focusing on the application of GBT for developing leadership skills in business courses. Our study incorporated three distinct teaching games in five different courses over a period of two semesters in the 2019-2020 academic years. The study included students enrolled in the M.S. of Science degree program in leadership and organization development. Each course had 36-40 participants, with a total of 397 students who participated in the study. The students were asked to execute a survey. 327 responses were received, which constituted an 82% response rate. The survey examined the pre-game, in-game, and post-game leadership skills. A total of 31 leadership skills were examined during the study using factor analysis. The findings of the study suggest that using a GMT to enhance leadership skill development including critical thinking, commitment, agility, innovation, creativity, motivation, conflict management, innovation, creativity, and team building is very effective. The results of the study revealed the leadership skills that were developed using the games and those that were underdeveloped and needed to be further improved.

Keywords: Game-Based Teaching, Leadership Skills, Factor analysis, Skills Development

INTRODUCTION

Games act as a source of entertainment and a platform for discussions and negotiations. Games that are based on pedagogical objectives are more likely considered to make learning and teaching experience more effective and interesting. Games have become an important part of this technological environment. They have an entertaining power to attract learners and capture their interest. Players can interact with each other as well as trainers, which helps them to share their feedback according to their experiences while playing learning games. The involvement and ability to share their opinions help players to boost their confidence and develop their leadership skills. Teaching using game-based methods presently are being implemented in various areas of learning. Game-based teaching is often defined as a learning method that supports an effective learning process (Van de Sande et al. 2015; Wouters; 2013). Games are designed to promote social interactions and improved skills development. The essential factor of teaching through gaming is that it provides the room for narrating and storytelling (Sausa & Rocha, 2019). Various organizations have successfully trained their employees using game-based teaching. Game-based teaching provides easy learning experiences and new opportunities for employers as well as employees to enhance their skills (Keesey, 2011). Games are mostly used in training by the government, army, health, and

education sector. They help in teaching, as it provides a play-like environment that improves practical skills and social communication. While playing a multi-player game, participants can learn the social compatibility, cultural acceptance, organizational rules, motivation, conflict management, negotiation, and values in minimal time. This helps to improve the relations between the employees and employers as well by learning modernized skills (Micheal & Chen, 2005). Through game-based teaching, there is room for improvement in thinking abilities, cognitive skills, and mental maps (Sausa & Rocha, 2019). In addition, game-based teaching helps in developing effective teaching, enhances the thinking process, and improves problem-solving skills (Akcaoglu & Koehler, 2014). In the education sector, game-based teaching allows participants to be more optimistic, creative, ambitious, improving mental maps, and visualization ability (Micheal & Chen, 2005).

In the current era of technology-rich environments, teaching using technology is the best method to make students mentally and physically involved in the learning process. With the deployment of technology in teaching and learning using computers and smart gadgets, it is possible to increase diversified learning (Klopfer et al. 2009). With the emerging advancements in game technologies, it is easy to design games according to predefined choices and preferences. Generation Z has discovered technological grounds for educational needs, described as "the first tribe of true digital natives" (Jagger et al. 2016). The generation openly embraces gaming platforms to gain access to learning. Games deliver learning in an entertaining way, which helps to develop the interest of the learners. As compared to the traditional methods of teaching, game-based teaching helps to engage the learners in the process of learning. There is an abundance of evidence reported in the literature which supports the efficacy of the game-based teaching method (Annetta et al. 2010). However, even though games have a robust mental effect as the player keeps being engaged while playing, some researchers have raised some concerns about the possibility of addiction in certain games. (Kuss et al. 2013). Since there exists some discrepancy between the computer's virtual reality and digitalized games, simulation models are used to address the discrepancy. Therefore, game-based teaching is based on simulation rather than reality. Simulation is "a dynamic and abridged model of reality judged by its realism, by its correspondence to the system which it represents" (Sauvé et al. 2007). Simulation games attempt to copy various activities from real life in the form of a game. They include elements of recreation supported by extra gaming components like imaginary characters, challenges, disputes, regulations, and pre-set objectives. With the latest evolutions in gaming technology, serious games have emerged as purpose-fit games designed primarily to meet specific requirements instead of just pure entertainment. Serious games are being developed progressively for a variety of purposes, such as defense, education, scientific exploration, health care, emergency management, city planning, engineering, and politics (Steinkuehler & Duncan 2008). The current research study is based on three different games incorporated in five different courses from 2019-2020 to include game-based teaching in delivering business courses at the master's level. The process started in 2019 with scanning of the relevant business courses by acquiring information from various stakeholders and developing a coordinated approach. The focus was to examine the impact of game-based teaching on the development of leadership skills.

In Section 2, we will provide a detailed literature related to game-based teaching and complete concepts along with factors that are examined during this study. Section 3 will present the research methodology, section 4 provides results of the study section 5 presents findings and discussion and lastly conclusion of the study at the end.

LITERATURE REVIEW

Game-based teaching is a concept that is designed in a way that uses a specific game to develop various skills. Games provide a learning environment and situations which develop the interest of learners. In contrast with the traditional pedagogical method, game-based teaching provides the trainer or teacher to ask the learners to solve problems while playing games. This helps in the development of problem-solving skills and critical thinking among learners (Shaffer, 2005). This teaching paradigm is strategically planned and is structured in stages and pre-set objectives. The aim is to enable the students to identify the various components of the problems under study. Based on this, game-based teaching is very distinctive than the traditional teaching system. It constitutes a paradigm shift from the model used in the traditional education system, where a trainer or educator is typically considered as the "center agent of action" rather than a facilitator or coach (Goncalves et al. 2016).

Perspectives of Game-Based Learning Theory

Listed below are the three perspectives of game-based learning theory:

- First and the central perspective is that gaming technologies control game-based learning, and the learning is perceived as a result of the game that is being played.
- The second perspective is that Game-based learning is not only controlled by gaming technologies but as well as training. The learning procedure is conducted during the game with different situations formed during the game, which is labeled as training.
- The third perspective states that game-based learning is based on educational grounds by playing games. This perspective helps to learn through competing and point-scoring system (Kapp, 2012).

Pedagogical games have recently witnessed tremendous technological advancement, which in turn has a significant impact on learning. According to Chen & Chen (2014), digital Game-based Leaching (GBL) software is developed for educational and entertainment purposes. GBL is considered as a virtual learning environment which allows the learners to involve in the situation and attain efficient learning by interactions, and exchange of information with other players. Jude et al. (2014) confirmed that GBL increases the motivation level of students and learners because of situational learning with the allowance of implementing the learned material in real-life (Jude et al. 2014). In 2014, Atenas and Havemann reported that people who adopt game-based teaching get the platform to learn and develop new skills and experiences. This method is intended to encourage the learners to adopt and improve creative skills by implementing their imaginations according to their knowledge and experiences (Atenas & Havemann, 2014). Lee and Hoa argue that games-based teaching procedure must be designed as a story or situation which could enhance the skills and fulfill learning objectives (Lee & Hao, 2015). Zhao and Ding observe that previous games were just a medium to amplify motivation for learning, but there was no proper focus on students. However, later games were designed with some difficulties and activities at different levels to resolve to enhance the skills of learners (Zhao & Ding, 2018).

Reasons for Adopting Game-Based Teaching

Given below are the main reasons to consider game-based teaching as a model for training and learning:

Flow: The concept of flow is one of the most popular constructs used to describe the playing experience and positive learning outcomes. Kiili has argued that games are most successful and engaging if they can produce flow experiences. There is evidence that Flow has a positive influence on performance enhancement, learning, and engagement (Kiili, 2005).

Motivation: According to verywellminds.com: "motivation is the process that initiates, guides, and maintains goal-oriented behaviors. It is what causes you to act, whether it is getting a glass of water to reduce thirst or reading a book to gain knowledge. Motivation involves the biological, emotional, social, and cognitive forces that activate behavior." The serious game integrates two aspects of motivation: playfulness and technology. Malone and Lepper (1987) considered both motivations and applied in a learning context. They identified four key features found in any environment to be considered as intrinsically motivating. These are challenge, curiosity, control, and imagination.

Player Involvement: This provides a platform where learners are kept involved by social involvement. Players must qualify through different levels and situations according to their knowledge and skills and to succeed through each level. They must keep their attention during each stage of the game. This increases the social interaction skills of players as well. The player involvement makes the game environment more interactive and enjoyable for the other players and competitors. Player involvement has a significant impact on the learning experience during the game.

Adaptivity: Players can modify the game according to their requirements. This increases the involvement of learners at each stage because they have a platform to enhance their skills. The player's performance is based on the adaptability of the game that changes with different types of games. The adaptivity is important to continue learning during the game and having positive feedback after the completion of the game. Players often tend to adapt to a certain game according to their choice and experience. Often games tend to be adaptive at the start, and levels adaptivity change with the change in difficulty. Students learn to adapt themselves in a different environment by using the experience learned during the games.

Graceful Failure: While using games as a platform for learning, the chances of students failure is greatly decreased. This is largely due to the fact that learners try to explore new ways to pass every level of the game. Teachers or trainers can correct learner's mistakes and provide just-in-time feedback for improvement. Teacher act as a coach and facilitator to help students advance at difficult times. Often students are more interested in game sessions that are facilitated by the teacher as they can seek guidance for reducing chances of failure (Plass et al. 2015).

Game-Based Educational Learning Theories

Game-Based learning can be generally categorized in one of the four major learning theories. These are "Cognitivism, constructivism, humanism and behaviourism" (Plass et al. 2015).

There is wide consences in the literature that Game-based learning is more intended on humanism and constructivism instead of behaviourism and cognitivism.

Game-Based learning as a cognitive perspective: Games can simplify cognitive processing in the following ways: (Vásquez et al. 2017).

Situatedness: The information can be processed and placed where it is required in games, which helps in significant learning. Even the real-life scenes can also be created in the virtual environment where the learners can apply their skills and can enhance them.

Transfer of learning: Games provide the platform to communicate and transfer the knowledge and skills of individuals.

Scaffolding and relevant feedback: Games provide the teachers and trainers to provide the learner's guidelines and feedback wherever and whenever they need it while playing at any stage or level.

Dynamic assessment: Games are designed in such a way to enable learners to succeed at every individual level. The learner is required to finish each level, so his next level will be determined according to his knowledge and skills. Knowledge and skills are determined by the performance of the learner on every level.

Representation of information: Games provide a comprehensive platform to represent information in different ways. Players can categorize and recognize the information according to their requirements. Learning and teaching get simplified when information is accessible in different formats.

Learning mechanics: The mechanisms in the game must be associated with the learning procedure. This mechanism helps in determining the satisfaction level and the speed of knowledge of the learner.

Gesture and movement: The expression of learning provides the gesture mapped with the learning material (Vásquez et al. 2017).

Game-Based Teaching and Students Efficiency

Student's efficiency can be enhanced by using games for teaching purposes. Learning through gamification refers to the deliberate use of gaming elements to solve problems and enhance learning (Kapp, 2012). When benefits of teaching through gaming are analyzed the most important benefits are:

- Critical thinking skills of students are developed and enhanced
- Students keep themselves engaged throughout the game, and this is the most effectual method to keep them engaged than any other traditional method (Snow, 2016).

Behavioural intention: The term behavioural intention states the level of acceptance of any person to accomplish a specific behaviour. There is an excellent level of interconnection between behavioural intention and learning prospects (Bourgonjon et al., 2013). According to research conducted by (Lee 2009), it was discovered that "flow experience, perceived enjoyment, and interaction affects learner's behaviour to play games for learning purposes." This was proved that behavioural intention has a vital role in influencing the behaviour of learners to play games while learning.

Perceived enjoyment: When games are used as a part of teaching, they create a fun environment for students with less stress and more enjoyment. Whereas in traditional teaching methods, students may remain unengaged and disconnected. Previously conducted studies presented results where students were more comfortable and positively energized while playing games for learning (Oo & Lim, 2016). Students provided their feedback that learning through

gaming is more fun and less stressful (Ibrahim et al. 2011). Perceived enjoyment is the leading interpreter for proving the fact of gaming acceptance (Ha et al. 2007).

Ease of use: Behavioural intention and ease of use of the gaming platform for learning and teaching are correlated with each other. Learners who adapt gaming platforms learn to explore more games, and this makes it easier for them to learn through games. Consequently, the desire to learn through gaming increases, so behavioural intention is influenced by the ease of use (Nguyen, 2015).

Perceived effectiveness: Perceived effectiveness is an essential element for anticipating the behavioural intention of students and teachers to use the gaming platform for learning (Elkaseh et al. 2016). Game mechanisms can be used for more efficient and effective training instead of traditional training methods. It is not advocated that conventional methods should not be considered as a part of learning. Instead, it is recommended that both methods must be blended to achieve an efficient learning platform (de Freitas & Neumann, 2013).

Game-Based Teaching and Leadership Skill Development

In leadership education, teaching through games and simulations is an essential factor. Briefly, in the simulation, all the factors of games are combined with some strategies, plans, and implemented in a realistic situation (Henrikson, 2010). An example of a business game can be considered to explain this point. Like, an organization can use a business game for training the staff about organizational developments. A scenario is presented about the organization, and the staff is asked to implement their strategies at every level according to their knowledge. The staff individually participates at each level and is responsible for the implementation of the rules according to his/her knowledge. The game is played using a computer where a shared network connection is provided, and participants can share their opinions and feedbacks about each other's performance after accessing it at each stage as there is a platform for discussion and presentation of views as well (Henrikson & Borgesen, 2016).

A study conducted by (Faria & Wellington, 2004) concluded that most of the postgraduate students of business education are required to play different kinds of business games. These games help to evaluate the leadership skills among the students. While accessing different business cases and organizational strategies. Games allow the managers to provide their feedback in a real-time and inexpensive environment. Games in business are used in teaching different topics and subjects, but the use in leadership education is most significant. Game-based training provides a complete knowledge of communications in the organization by making each employee participate in the gaming process (Henrikson & Borgesen, 2016).

Leadership skills: Leadership skills tend to be an essential element in any business or government organization. These skills help people to direct and influence co-workers or colleagues to implement certain information that is required for the development of the organization. Leadership is classified in the following four categories:

Category 1: Is of cognitive skills, which are related to the collection, proceeding, and broadcasting of the information.

Category 2: Is of interpersonal skills which are related to the interactions and influencing people with one's negotiation skills

Category 3: Is the business skills which are related to managerial and operational skills.

Category 4: Is strategic skills, which are mostly related to intellectual skills, which are required to understand the complexities and resolve them, basically known as problem-solving skills.

In this research study, we selected thirty-one leadership skills from the four leadership categories listed above. The thirty-one leadership skills are listed in the Table 1 below with a brief description:

Table 1
LEADERSHIP SKILLS BRIEF DESCRIPTION

Skills	Brief Description
Relationship /Team Building	Organizational success depends on the proficiency of its employees to successfully interact and achieve the organizational goals together as a team (Hard et al. 2015; Westraadt, 2019).
Agility	Agility is derived from the changes especially, changes in the needs of customers, changes in the market, technological changes, social and cultural developments, and competition (Tria et al. 2016; Dunlop-Hinkler et al. 2011).
Adaptability /flexibility	Adaptivity/ flexibility is described as the adjustment and understanding of employees for the unpredictability in the competitive environment (Yu, 2020; Mudannayake, 2019).
Innovation	Innovation plays the role of a critical factor in attaining organizational success and sustainability in the market (Sagir, 2017). Leaders try to assure that the best people are hired in the team to find and implement innovative ideas (Karnups, 2016).
Creativity	Creativity is the concept of transforming innovative ideas into reality (Kalyar, 2011). Employees need to use their abilities to discover unique and creative ideas for organizational development (Guo et al. 2016).
Motivation	Motivation plays the role of an internal process that increases the interests of the employees to achieve their objectives (Hazra et al. 2018; Hannus, 2016).
Decision Making/Decisiveness	Decisiveness establishes measures to improve relationships between the employees and stakeholders (Leonova et al. 2017).
Conflict Management	Leaders must have conflict management skills which they can attain through being innovative and competent enough to bring out the solutions for the arising conflicts (McKibben, 2017; Abiodun, 2014).
Negotiation	Leaders must have skills of negotiation to maintain the peace in the organizational environment, which will ultimately result in organizational success (Khan & Baldini, 2019; Săvescu, 2019).
Critical thinking	Critical thinking is considered as the essential skill to achieve success in every field of life in the 21 st century (Calma & Davies, 2020; Eggers et al. 2017).
Focused and results oriented	The positive outcomes of a focused and result-oriented leadership may help the organizations to lead the market as well (Jingjing & Yingqi, 2011; Pratoom, 2018).
Communication	Good leadership needs effective communication in order to maintain good relationships with the employees to achieve the targeted goal (Wikaningrum & Yuniawan, 2018; Whitaker, 2018).
Time Management	Leaders must be aware of easy planning and strategic tools which are required to select the roadmap for timely projects completion (Skryhun & Nyzhnyk, 2020).
Cultural Intelligence	Cultural intelligence is an important part of leadership skills as it helps to maintain good relationships in the organization and with the external environment as well (Alon et al. 2018).
Accountability	Accountability is a vital concept to implement effective policies and rules by the leaders. (Melo et al. 2019).
Commitment	Commitment has a positive relationship with organizational development and success, which would finally result in organizational success (Eliyana et al. 2019).
Self-Awareness	Organizations need good leaders who have self-awareness skills and can manage the teams and tasks efficiently (Rubens et al. 2018).
Delegation	Delegation is the procedure of passing and responsibilities the work to subordinates for increasing effectiveness (Kusworo, 2020).
Consistency	Consistency in the leadership helps to maintain a positive image of the organization as well as of the leader, which can lead to the success of the organization (Manganye, 2019)
Honesty/Integrity	Integrity and honesty are observed by the behavior of the organization management and leaders (Engelbrecht et al. 2017).

Emotional Intelligence	Effective leadership requires proper levels of emotional intelligence (Dartey-Baah & Mekpor, 2017).
Facilitation Skills	Facilitation refers to the skill of skimming, attention-grabbing, and refining the creative pressure within the team to aid it in following the directions (Schaffer, 2019).
Coaching skill	Efficient leadership requires practical coaching skills to make employees work according to the requirements for completing the task (Coaching et al. 2018).
Confidence	Confidence is attained by self-judgment and determination. If a leader has enhanced confidence, he can influence his subordinates by expressing his sureness and assurance for the specific task (Axelord, 2017; Raso, 2017).
Dependability	Dependability is referred to as "Worthy of trust." Dependability is the base of good leadership (Dhiman & Marques, 2017).
Flexibility	In this competitive era and rapidly changing environment, leaders must develop flexibility in their leadership and decisions to compete in the market (Baron et al. 2018).
Risk-Taking	Leaders must develop skills for taking risks in order to improve their productivity levels according to the needs of the time (Jung et al. 2020).
Positivity	Effective leadership develops the learning among the subordinates with the positive personality traits of leaders (Shahid & Muchiri, 2018).
Active Listening	Leaders must have the skills of active listening as the team members in the organizations may feel many problems that can affect their performance (Jonsdottir & Fridriksdottir, 2019).
Empathy	Empathy refers to the concept of understanding the feelings of a person by placing oneself into the position of the other person (Tzouramani, 2017).
Patience	Patient leaders tend to be open-minded and can act positively in the long-term development of the organizations (Eich, 2017).

RESEARCH METHODOLOGY

In this study, we use quantitative analysis as our research methodology. Three distinct teaching games were incorporated into five different courses for two consecutive semesters in the 2019-2020 academic year. A total of 397 students were enrolled in all five courses over the two semesters. A questionnaire was developed to examine the leadership skills pre-game, in-game, and post-game for identification of improvement of leadership skills. A total of 327 responses were received from students enrolled in all five different courses, which constituted 82% response rate. There were no duplicate students in any of the courses. Each student took only 1 course with 3 games. 92% of the enrolled students were employed in governmental and private organizations with leadership roles. The courses were part of the M.S. program in leadership and organization development.

The research focused on application of serious games in teaching to enhance leadership skills development, identifying the of improvement gains, and obtain insights to generalize the main features of the game into other relevant courses and programs.

Instrument and Measures

A total of 31 leadership skills (dimensions) were examined with questions based on a Likert Scale of 7 from strongly agree to strongly disagree relevant to the development of leadership skills during pre-game, in-game, and post-game. The questions were based on asking individuals about leadership skills developed over five courses.

Data Analysis

The data analysis was done using IBM SPSS. The number of observations was 327 for the factor analysis with Kaiser-Meyer-Olkin (KMO) as 0.610, and eigenvalue >1 was detected

to be in an acceptable range. Principle factor analysis was used as the extraction method. The varimax method was used to have even variability among the variables. There were highly significant correlations due to close similarities among the variables. All variables were analyzed using Cronbach Alpha for internal consistency as shown in Table 2, which was found to be very good at 0.819. The individual Cronbach Alpha for each variable was also very good, as shown in Table 2.

**Table 2
CRONBACH ALPHA OF FACTORS**

	Cronbach Alpha
Relationship /Team Building	0.951
Agility	0.856
Adaptability/flexibility	0.915
Innovation	0.715
Creativity	0.816
Motivation	0.988
Decision Making/Decisiveness	0.751
Conflict Management	0.812
Negotiation	0.897
Critical thinking	0.941
Focused and results oriented	0.903
Communication	0.936
Time Management	0.878
Cultural Intelligence	0.709
Accountability	0.717
Commitment	0.815
Self-Awareness	0.833
Delegation	0.813
Consistency	0.8
Honesty/Integrity	0.709
Emotional Intelligence	0.911
Facilitation skills	0.855
Coaching skill	0.874
Confidence	0.925
Dependability	0.949
Flexibility	0.966
Risk-Taking	0.716
Positivity	0.743
Active Listening	0.851
Empathy	0.965
Patience	0.799

**Table 3
PRE-GAME, IN-GAME, POST GAME FACTOR ANALYSIS**

	Pre-Game	In-Game	Post-Game
Relationship /Team Building	-0.055	0.489	0.715
Agility	-0.061	-0.012	0.498
Adaptability/flexibility	-0.151	0.315	0.514
Innovation	-0.213	0.207	0.465
Creativity	0.071	0.198	0.347
Motivation	-0.091	0.15	0.704
Decision Making/Decisiveness	0.014	0.189	0.436
Conflict Management	0.215	0.388	0.655
Negotiation	0.199	0.3	0.808
Critical thinking	-0.157	0.298	0.523
Focused and results oriented	-0.218	0.355	0.802
Communication	0.416	0.598	0.726
Time Management	0.317	0.611	0.882
Cultural Intelligence	-0.013	0.208	0.945
Accountability	0.211	0.589	0.706
Commitment	0.313	0.713	0.985
Self-Awareness	0.512	0.664	0.812
Delegation	-0.125	0.409	0.769
Consistency	0.351	0.522	0.821
Honesty/Integrity	-0.099	0.106	0.322
Emotional Intelligence	-0.31	0.189	0.499
Facilitation skills	0.125	0.3	0.741
Coaching skill	0.415	0.688	0.763
Confidence	0.518	0.758	0.989
Dependability	0.319	0.525	0.756
Flexibility	0.418	0.777	0.909
Risk-Taking	0.077	0.245	0.523
Positivity	0.751	0.45	0.788
Active Listening	0.689	0.522	0.701
Empathy	0.145	0.278	0.489
Patience	0.355	0.598	0.726

PCA was used to identify the patterns and similarities in each of the components. Table 3 provides the factor analysis by taking into account pre-game, in-game, and post-game. The factor components were tested further with higher loadings to identify the components which have the highest correlation scores.

FINDINGS AND DISCUSSION

The goal of the research was to examine the role of game-based teaching in leadership skills development through the usage of games. The game methodologies and tools emergence were guided and controlled by the instructor with goals to meet the Course Learning Outcomes (CLO) of each course, identification of the problem, and improving the decision making

process. The identification of the developed skills by individual students was examined using the pre-game, in-game, and post-game questions.

The results of the factor analysis showed that there were significant improvements in the development skills of the in-game and post-game of the individual using game-based teaching. The results were further filtered to leadership skills having the highest difference more significant than 0.500 during pre-game and post-game, as shown in Table 4. The results demonstrate that 14 skills were developed higher than the other skills. The reason for this is driven by indicates the students desire to improve their underdeveloped skills.

**Table 4
HIGHLY DEVELOPED LEADERSHIP SKILLS**

	Pre-Game	Post-Game
Relationship /Team Building	-0.055	0.715
Agility	-0.061	0.498
Adaptability/flexibility	-0.151	0.514
Innovation	-0.213	0.465
Motivation	-0.091	0.704
Negotiation	0.199	0.808
Critical thinking	-0.157	0.523
Focused and results-oriented	-0.218	0.802
Cultural Intelligence	-0.013	0.945
Commitment	0.313	0.985
Delegation	-0.125	0.769
Emotional Intelligence	-0.31	0.499
Facilitation skills	0.125	0.741
Flexibility	0.418	0.909

The filtered skills are compared with the categories cognitive, interpersonal, business, and strategic to measure the skills improvement at the macro level, as shown in Table 5.

**Table 5
MACRO-LEVEL SKILLS VS. CATEGORIES**

Categories	Skills
Cognitive Skills	Relationship /team building, Focused and results-oriented
Interpersonal Skills	Negotiation, Motivation, Commitment, Delegation
Business Skills	Innovation, Agility, Adaptability/Flexibility, Facilitation Skills
Intellectual Skills	Critical Thinking, Cultural Intelligence, Emotional Intelligence

The macro-level activities show that individuals were more focused on the development of interpersonal and business categories with 4 leadership skills associated with each of them. Where as, 3 leadership skills were associated with intellectual skills and lastly 2 with cognitive skills. Further, this shows that individuals want to increase their managerial and

communication skills more than other skills. The gap for improvement of individual leadership skills is evident from the categories.

Game-based Teaching experience

The faculty has worked on improving their teaching skills through a game-based teaching method over two semesters. It was found that game-based teaching made the course interactive, and students were much more interested in attending the game-based activities. The students found the games challenging at the start, but with the guidance of the instructor throughout the activities made it more engaging with a greater learning experience. Game-based teaching increased faculty coordination. Nevertheless, game-based teaching needs incorporation in all relevant courses of the M.S in leadership and organizational development program. There are still challenges to train faculty members to incorporate game-based teaching in their courses and to improve the learning experience for the students.

CONCLUSION

The research focused on application of serious games in teaching to enhance leadership skills development, identify the improvement gains, and obtain insights to generalize the main game features into other relevant courses and programs. The results of the factors analysis demonstrated that there were significant improvements in development of leadership skills using game-based teaching method. The skills were filtered to highly improved leadership skills that indicated the student desire to improve their underdeveloped skills. The macro level comparison of highly developed leadership skills and categories indicated students focus on development of managerial and communication skills other than intellectual and cognitive skills. In addition, our study demonstrated that using games in the courses does not require any additional cost yet develop the leadership skills in an efficient, fun, and interactive way for the students. Also, the leadership skills identified in the study provide insights to the organizations as well as education institutes to focus on the identified skills during this study. The study revealed that game-based teaching offers a detailed insight into a teaching model that can help to overcome the challenges and complexities in the development of leadership skills by the students.

Future research can be based on the viewpoint of faculty teaching the game-based courses and their journey of teaching. More empirical analysis can be conducted by determining the successful and unsuccessful game-based teaching experiences as well as resistance by educators for adopting a game-based teaching method.

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